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APPENDIX D

Detailed Figures of New Access Roads and Associated Road Drainage Systems and Stormwater Diversion Structures

(provided on CD)

APPENDIX E

Nesting Bird Management Plan

SOUTHERN CALIFORNIA EDISON
SAN JOAQUIN CROSS VALLEY LOOP TRANSMISSION PROJECT

NESTING BIRD MANAGEMENT PLAN

PREPARED FOR AND BY:

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Acronyms

APM	Applicant Proposed Measures
BGEPA	Bald and Golden Eagle Protection Act
BSA	Biological Survey Area
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CPUC	California Public Utilities Commission
ESA	Environmentally Sensitive Area
FEIR	Final Environmental Impact Report
FESA	Federal Endangered Species Act
FRED	Field Reporting Environmental Database
MBTA	Migratory Bird Treaty Act

MM	Mitigation Measures
mph	miles per hour
Plan	Nesting Bird Management Plan
SCE	Southern California Edison
Cross Valley Loop	San Joaquin Cross Valley Loop Transmission Project
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

Chapter 1
Introduction

Southern California Edison prepared this Nesting Bird Management Plan (Plan) to provide a framework for management and monitoring of bird nesting activities during construction of the San Joaquin Cross Valley Loop Transmission (Cross Valley Loop or Project) Project, a new double circuit 220 kilovolt (kV) transmission line circuit scheduled to loop into the existing 220 kV Rector Substation and the existing Big Creek 3 – Springville 220kV transmission line. This project goes through the City of Visalia, but primarily resides within unincorporated Tulare County, and will entail the removal and consolidation of the existing Big Creek 1 – Rector and Big Creek 3 – Rector 220 kV transmission lines, construction to structures immediately south of Rector Substation, construction of the new double circuit 220kV Cross Valley Loop transmission lines, construction to structures north and south of the connection point of the Big Creek 3-Springville 220 kV transmission line, installation of telecommunication lines, construction of required laydown yards, construction and maintenance of existing and new access roads, installation of electrical equipment and substation supporting structures for the transmission lines, installation of telecommunication, as well as additional construction work to occur at Rector, Springville, Vestal, and Big Creek 3 Substations.

The purpose of the plan is to assist Southern California Edison (SCE) in complying with the mitigation measures pertaining to nesting birds as outlined in the Cross Valley Loop Final Environmental Impact Report (FEIR) (FEIR, ESA 2010) as well as the applicable federal and state regulations and permits with which the measures are designed to comply. Specifically, this Plan addresses how compliance with the following Mitigation Measures (MM) will be achieved:

- MM BIO 4.4-3: Conduct pre-construction biological surveys and construction restrictions for golden eagle and Swainson's hawk.
- MM BIO 4.4-4: Conduct pre-construction surveys, construction restrictions, and monitoring for breeding birds.
- MM BIO 4.4-5: Conduct pre-construction biological surveys and construction restrictions for burrowing owl nests.

Additionally, this Plan is designed to provide a framework for compliance with applicable federal and State regulations, as they pertain to bird nesting activities, including:

- Federal Endangered Species Act;
- Migratory Bird Treaty Act;
- Bald and Golden Eagle Protection Act;
- California Endangered Species Act; and
- California Fish and Game Code Sections 3511, 3503, 3503.5, 3505, 3513, 3800, 3801.6, and 1600.

This Plan outlines the regulatory framework that protects birds and their nesting activities; summarizes the pertinent mitigation measures from the FEIR and applicable state and federal regulations; describes the approach and methods to survey for, monitor, and manage bird nesting

activities during construction; and presents pertinent natural history information used to assess relevant species' tolerance to disturbance and to develop buffer requirements for establishing no work zones around active nests. This Plan provides a framework for managing nests in and around the Cross Valley Loop Project construction areas (e.g., structure construction sites, laydown/staging areas, contractor and material yards, helicopter assembly and support yards, substation sites, and access/spur roads) in a manner to avoid take of active nests (see Section 1.2) during Cross Valley Loop Project construction.

1.1 Cross Valley Loop Project Overview

1.1.1 Project Purpose Statement

Construction of the Cross Valley Loop Project is needed to maintain safe and reliable electric service to customers and to serve forecasted electrical demand in the southeastern portion of the San Joaquin Valley. Historically, the existing 220 kV transmission line configuration within the Big Creek Corridor has met the electrical demand in the Electrical Needs Area, which encompasses the Cities of Tulare, Visalia, Hanford, Farmersville, Exeter, and Woodlake, as well as surrounding areas of Tulare and Kings County. However, growth in demand on the western side of the Big Creek Corridor has resulted in transmission lines operating at or near capacity, while the transmission lines on the eastern side are underutilized. The unequal distribution of load has resulted in overloads on the 220kV transmission lines serving Rector Substation from the Big Creek Hydroelectric Project.

The Cross Valley Loop Project was identified by the California Independent System Operation Corporation (CAISO) as the most economically feasible upgrade and is required to reduce the possibility of overloads on the existing 220kV transmission lines in the Big Creek Corridor.

1.1.2 Project Location and Description

The Cross Valley Loop Project is located in Tulare County, which encompasses 4,863 square miles near the center of California. Tulare County is bordered by Kings County to the west, Kern County to the south, Fresno County to the north, and Inyo County to the east. The City of Visalia is situated approximately 43 miles from Fresno, 189 miles from Los Angeles, and 228 miles from San Francisco.

The Cross Valley Loop transmission line corridor begins at SCE's Rector Substation, located in eastern Visalia, and continues north along existing SCE right-of-way (ROW) for approximately 10.8 miles. From there, the corridor continues along new ROW to be acquired 12.2 miles to the east, then north, and eventually winds along the base of Lone Oak Mountain to loop into the existing Big Creek 3 – Springville 220 kV transmission line (Figure 1). The proposed project will include removal and installation of transmission towers and tubular steel poles (TSP), road construction, construction at existing SCE substations (Rector, Springville, Vestal, and Big Creek 3 Substations), conductor and telecommunication line pulling, construction and maintenance of existing and new access roads, establishment of laydown areas, and vehicle parking and will involve the use of cranes, graders, dump trucks, dozers, transport trailers, helicopters, and miscellaneous vehicles (see in detail below).

- Replacement of approximately 11.1 miles of two parallel sets of existing single circuit 220 kV transmission line segments (Big Creek 1-Rector 220 kV and Big Creek 3-Rector 220kV transmission lines) with 11.1 miles of new, double circuit transmission line to be constructed on

the western side of SCE's existing ROW immediately north of the Rector Substation. The new line location would provide enough space along the eastern side of the existing SCE ROW for the construction of 10.8 miles of an additional transmission line;

- Construction of a new, approximately 23 mile long, double circuited 220kV transmission line that would loop the existing Big Creek 3-Springville 220 kV transmission line into the 220/66 kV Rector Substation creating the new Big Creek 3-Rector No. 2 220 kV transmission line circuit and the new Rector-Springville 220kV transmission line circuit. The project begins at the Rector Substation and heads due north, following the existing SCE ROW for approximately 10.8 miles. At mile 10.8, the alignment runs east for 3.5 miles to mile 14.3. From mile 14.3 to mile 15.0, the alignment turns north to parallel Road 176 to Avenue 376. The alignment then proceeds east, paralleling Avenue 376 and then southeast through a saddle along the base of Colvin Mountain to Road 194. From mile 17.3 to 17.9 the alignment extends south and then southeast to Road 196. From there, the alignment continues east approximately 1.2 miles and then south 0.6 miles. At mile 19.7, the alignment turns east along the base of Lone Oak Mountain until it reaches the existing Big Creek 3-Springville 220 kV transmission line at a point approximately 52 miles south of Big Creek Powerhouse No. 3;
- Modifications to structures immediately south of Rector Substation; and north and south of the where the new Cross Valley Loop transmission line taps into the existing Big Creek 3 – Springville 220kV transmission line;
- Installation of electrical equipment and substation supporting structures for the transmission lines, protective relays, and a mechanical and electrical equipment room (MEER) at Rector Substation to accommodate the transmission lines;
- Removal of wave traps and line tuners and installation of additional protective relays at Rector Substation, Springville Substation, Vestal Substation and Big Creek 3 Substation; and
- Construction of associated access roads, spur roads, wire stringing sites, material storage sites, and other facilities that may occur both within the ROW and off site.

1.1.3 Project Habitat Description

The Cross Valley Loop Project is located between the San Joaquin Valley and southern Sierra Nevada Foothills. Though the project primarily crosses flat, cultivated lands, the eastern approximate eight mile leg of the route traverses the low slopes of the Sierra Nevada foothills. Elevations range from about 350 feet to 650 feet above mean sea level (AMSL) from west to east. The vegetation communities identified within the project area include agriculture, urban and disturbed, nonnative annual grassland, interior live oak woodland, rock outcrops, wetlands, great valley mixed riparian forest, and great valley valley oak riparian forest; and are provided in greater detail below (Quad Knopf, 2010).

The project area west of the Friant-Kern Canal includes primarily agricultural, as well as urban and disturbed areas. The project area east of Friant-Kern Canal is dominated by nonnative grasslands with rock out crops and wetlands scattered throughout. The riparian forests are primarily found along the St. John's River and Cottonwood Creek.

Agricultural lands are intensively cultivated and primarily include grapes, stone fruits, citrus, walnuts, and olives. These areas do not support natural vegetation. Irrigated pastures are dominated

by dallis grass (*Paspalum dilatatum*), perennial ryegrass (*Lolium perrene*), and common herbaceous forb species, such as clover (*Trifolium* sp.) and filaree (*Erodium* sp.).

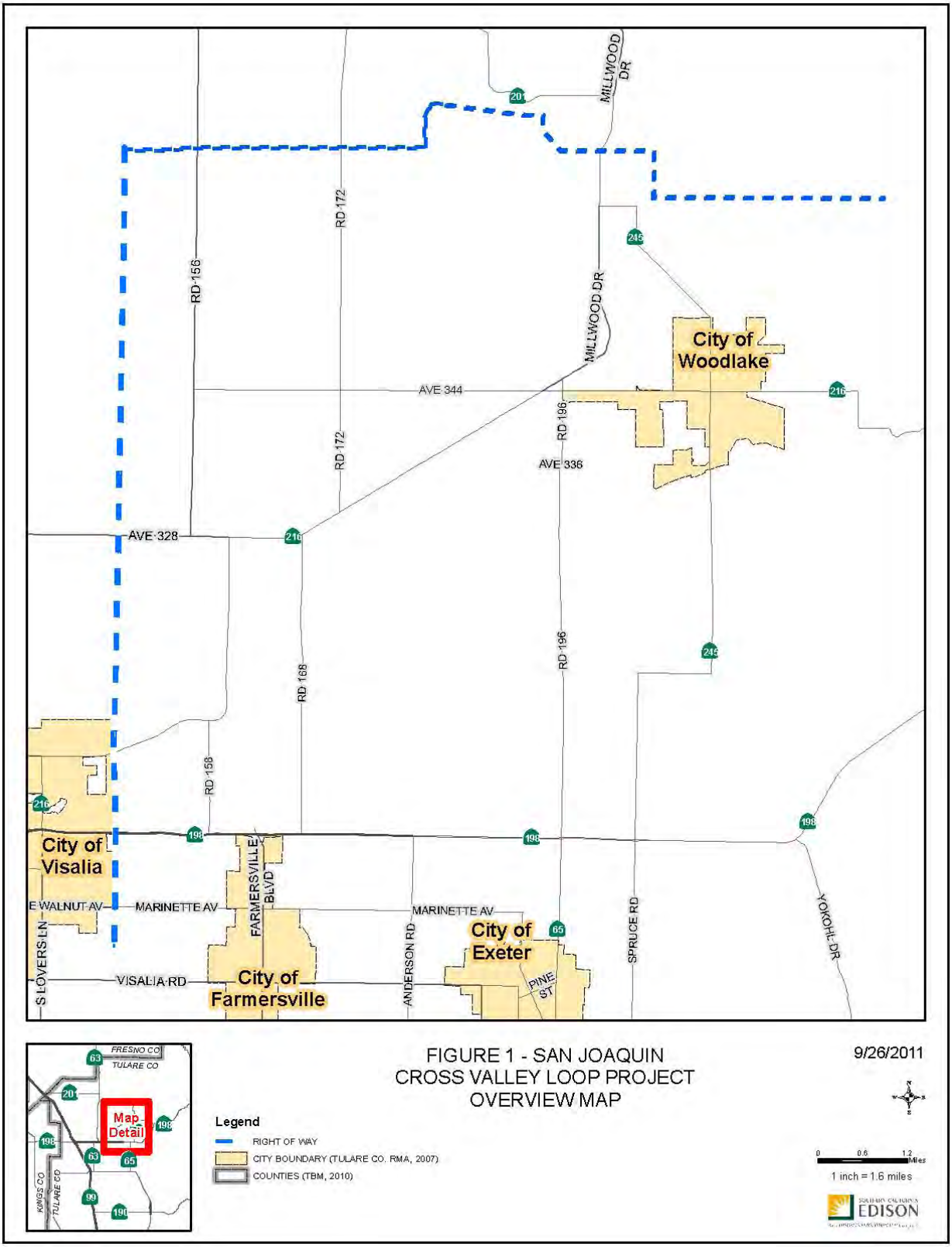
Urban and disturbed areas are comprised of ranches, houses, agricultural, and commercial buildings that is intermixed with agricultural lands, heavily disturbed areas, and native habitats dominated by prickly lettuce (*Lactuca serriola*), milk thistle (*Silybum marianum*), horseweed (*Conyza erodias*), telegraph weed (*Heterotheca grandiflora*), and Bermuda grass (*Cynodon dactylon*).

Nonnative annual grasslands along the project are dominated by grasses and forbs comprised of soft chess (*Bromus hordeaceaous*, ripgut brome (*B. diandrus*), red brome (*B. madritensis*), wild oats (*Avena barbata* and *A. fatua*), foxtail barley (*Hordeum jubatum*), annual rye (*Lolium multiflorum*), filaree (*Erodium cicutarium*), fiddleneck (*Amsinckia menziesii*), purple brodiaea (*Dichelostemma pulchella*), pepperweed (*Lepidium nitidum*), blow-wives (*Achyrachaena mollis*), bicolor lupine (*Lupinus bicolor*), popcorn flower (*Plagiobothrys nothofulvus*), lotus (*Lotus micranthus*), and gilia (*Gilia tricolor*). Additionally, seasonal wetlands and vernal pools are scattered throughout the nonnative annual grassland areas and primarily support spiny-sepaled button celery (*Eryngium spinosepalumi*), which is a sensitive plant species, loosestrife (*Lythrum hyssopifolia*), goldfields (*Lasthenia fremontii*), woolly heads (*Psilocarphus tenellus*), popcorn flower (*Plagiobothrys stipitatus*), seep grass (*Crypsis schoenoides*), foxtail (*Alopecurus howellii*), and spikerush (*Heleocharis acicularis*).

Rocky outcrops are dominated by bush monkeyflower (*Mimulus aurianticus*), pterostegia (*Pterostagia drymarioides*), lamarkia (*Lamarckia aurea*), spider lupine (*Lupinus benthamii*), poison oak (*Toxicodendron diversiloba*), and golden yarrow (*Eriophyllum confertifolium*).

Riparian forests are comprised primarily of arroyo willow (*Salix lasiolepis*), California sycamore (*Plantanus racemosa*), Gooding's willow (*S. goodingii*), button-willow (*Cephalanthus occidentalis*), Oregon ash (*Fraxinus latifolia*), rush (*Juncus balticus*), seep monkey-flower (*Mimulus guttatus*), spikerush (*Heleocharis acicularis*), himalaya blackberry (*Rubus armeniacus*), blue elderberry, wild grape (*Vitis californica*), and stinging nettle (*Urtica dioica holosericea*).

The Cross Valley Loop Project is dominated by two varieties of oak trees found scattered throughout the project area. Valley oak trees (*Quercus lobata*) dominate the lower elevations of the study corridor to the west of the Friant-Kern Canal, while interior live oak trees (*Quercus wizlizeni*) are primarily found in the higher elevations to the east of the Friant-Kern Canal.


MILLWOOD DR
RD 172
RD 156
MILLWOOD DR
City of Woodlake
AVE 344
RD 196
AVE 336
RD 172
AVE 328
RD 196
RD 168
RD 168
City of Visalia
E WALNUT AV
MARINETTE AV
FARMERSVILLE BLVD
MARINETTE AV
City of Exeter
SPRUCE RD
YOKOHL DR
S LOVERS LN
VISALIA RD
City of Farmersville
ANDERSON RD
PINE ST
FRESNO CO
TULARE CO
Map Detail
KINGS CO
TULARE CO
Legend
RIGHT OF WAY
CITY BOUNDARY (TULARE CO. RMA, 2007)
COUNTIES (TBM, 2010)
FIGURE 1 - SAN JOAQUIN CROSS VALLEY LOOP PROJECT OVERVIEW MAP
9/26/2011
0 0.6 1.2 Miles
1 inch = 1.6 miles
EDISON

1.2 Regulatory Setting

There are a number of federal and state regulations that afford varying degrees of protection for birds and their nesting activities. The applicable regulations and permits are summarized below along with the applicable FEIR MMs, which provide the regulatory framework within which the Cross Valley Loop Project must comply. Additional permits, including state and federal incidental take permits, are being acquired for the project, which may provide additional permit conditions for management of listed avian species. The measures within this plan may need to be modified once permits are received. Applicable permit conditions for management of listed avian species will be detailed in the Biological Opinion (BO), Habitat Conservation Plan (HCP), 2081 Incidental Take Permit (ITP), and 1600 agreements, once obtained.

1.2.1 Federal Regulations

1.2.1.1 Federal Endangered Species Act

The Federal Endangered Species Act (FESA) and its subsequent amendments provide guidance for the conservation of endangered and threatened species and the ecosystems upon which they depend. FESA Section 9 lists activities that are prohibited by the act. For example, "take" of any listed species is prohibited. Take under FESA is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.

1.2.1.2 Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA) is a law implemented as a result of treaties with Britain (on behalf of Canada), Mexico, the U.S.S.R. (now Russia), and Japan that makes it unlawful, except as formally permitted, to take (pursue, hunt, take, capture, or kill) migratory birds except under permits for special situations such as imminent threat to human safety or scientific research. The law currently applies to more than 1,000 species including most native birds and covers the destruction or removal of active nests of those species. These protections apply whether or not there was intent and regardless of whether other entitlements are in place, such as approvals under the California Environmental Quality Act (CEQA). Domestic waterfowl [including domesticated mallards), feral (rock) pigeon, chukar, Eurasian collared-dove, spotted dove, parrots, parakeets, red-whiskered bulbul, European starling, house sparrow, weavers, bishops, and mannikins] are not covered by the MBTA.

1.2.1.3 Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) was first enacted in 1940 to prohibit take, which here includes to kill, wound, or disturb bald eagles (*Haliaeetus leucocephalus*), except when permitted by the Secretary of Interior. In 1962, the act was amended to afford the same level of protection to golden eagles (*Aquila chrysaetos*).

1.2.1.4 Fish and Wildlife Conservation Act

The 1988 amendment (Public Law 100-653, Title VIII) to the Fish and Wildlife Conservation Act (FWCA) requires the Secretary of the Interior, through the U.S. Fish and Wildlife Service (USFWS) to "identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act (ESA) of 1973." *BCC 2008* is the most recent effort to carry out this proactive conservation mandate and update *Birds of Conservation Concern 2002* (USFWS 2002). The overall goal of the *BCC 2008* list is to accurately identify the migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that represent our highest conservation priorities. *BCC 2008* encompasses three distinct geographic scales - North American Bird Conservation Initiative (NABCI) Bird Conservation Regions (BCRs), USFWS Regions, and National—and is primarily derived from assessment scores from three major bird conservation plans: the Partners in Flight North American Landbird Conservation Plan, the United States Shorebird Conservation Plan, and the North American Waterbird Conservation Plan. The primary statutory authority for *Birds of Conservation Concern 2008* (*BCC 2008*) is the Fish and Wildlife Conservation Act of 1980 (FWCA), as amended; other authorities include the Endangered Species Act (ESA) of 1973, the Fish and Wildlife Act of 1956, and 16 U.S.C. § 701.

1.2.2 State of California Regulations

1.2.2.1 California Fish and Game Code

California Endangered Species Act

The California Endangered Species Act (CESA) establishes the policy of the state to conserve, protect, restore, and enhance threatened or endangered species and their habitats. It prohibits the take of any species that the California Fish and Game Commission determines to be a threatened or endangered species and is administered by the California Department of Fish and Game (CDFG). The CESA also mandates that state agencies should not approve projects that would jeopardize the continued existence of threatened or endangered species if reasonable and prudent alternatives are available that would avoid jeopardy. There are no state agency consultation procedures under the CESA. For projects that affect both a federally and state listed species, compliance with the FESA will satisfy the CESA if the CDFG determines that the federal incidental take authorization is "consistent" with CESA under California Fish and Game Code Section 2080.1.

Sections 3511—Fully Protected Species

The legislature of the State of California designated species as "fully protected" prior to the creation of CESA. Lists of fully protected species were initially developed to provide protection to those animals that were rare or faced possible extinction and included fish, mammals, amphibians, reptiles, and birds. Most fully protected species have since been listed as threatened or endangered under CESA and/or FESA. These species may not be taken or possessed at any time, with the only exception being permits for limited scientific study.

Sections 3503, 3503.5, 3505, 3513, 3800, 3801.6—Native Birds

These California Fish and Game Code sections protect all birds, birds of prey, and all nongame birds, as well as their eggs and nests, for species that are not already listed as fully protected and that occur naturally within the state. Section 3503.5 specifically states that it is unlawful to take any raptors (e.g., hawks, owls, eagles, and falcons), or their nests and eggs.

In most cases, issues that will arise during construction of the Cross Valley Loop Project will be associated with species protection under the MBTA and the California Fish and Game Code sections pertaining to native birds. It should be noted that while the management strategies presented in this Plan focus on those species protected under these regulations , this Plan was created to manage all species protected under all federal and state laws and regulations.

1.2.3 FEIR Mitigation Measures

The Cross Valley Loop Project must also comply with the Mitigation Measures (MMs) contained within the Cross Valley Loop Project's FEIR (FEIR, ESA 2010). All MMs related to migratory and nesting bird protection will be implemented during construction of the Cross Valley Loop Project and are summarized below. In some cases, such as with golden eagle, measures proposed within this Plan may be more stringent than the MMs within the FEIR for the Project. The measures proposed within this Nesting Bird Management Plan were developed in compliance with the MMs within the Cross Valley Loop Project FEIR.

MM BIO 4.4-3: SCE and/or its contractors shall begin construction near recently active nest sites for Swainson's hawk and/or golden eagle outside the active nesting season, whenever feasible. The nesting period for golden eagle is generally between March 1 and August 15. If construction activities begin during the nesting period, a qualified biologist shall perform a preconstruction survey 14 to 30 days before the start of each new construction phase to search for golden eagle and Swainson's hawk nest sites within one-half mile of the proposed activities. If active nests are not identified, no further action is required and construction may proceed.

If active golden eagle nests are identified, construction contractors shall observe CDFG avoidance guidelines below (the resource agencies do not issue take authorization for this species):

- Maintain a minimum 500-foot buffer zone around active golden eagle nests. Buffer zones shall remain until young have fledged.
- Agency approval is required to conduct activities within this buffer zone; and a qualified biologist shall monitor construction activities and the eagle nest(s) to monitor eagle reactions to activities. If activities are deemed to have a negative effect on nesting eagles, the biologist shall immediately inform the construction manager that work should be halted, and CDFG will be consulted.

For Swainson's hawk, if construction begins during the Swainson's hawk nesting period, a qualified biologist shall conduct preconstruction surveys at least 14 days prior to construction following CDFG guidance in areas that potentially provide nesting opportunities to verify species presence or absence. If the survey indicates presence of nesting Swainson's hawks within a half-mile radius, the results shall be coordinated with CDFG to develop and implement suitable avoidance measures that include construction buffers (e.g., 500 feet) and nest monitoring during construction. Mitigation

shall be consistent with the Staff Report Regarding Mitigation for Impacts to Swainson's Hawks in the Central Valley of California (CDFG, 1994) and include the following approach:

- No intensive new disturbances or other project-related activities that could cause nest abandonment or forced fledging shall be initiated within a quarter mile (buffer zone) of an active nest between March 15 and September 15.
- Nest trees shall not be removed unless no feasible avoidance exists. If a nest tree must be removed, SCE shall obtain a management authorization (including conditions to offset the loss of the nest tree) from CDFG. The tree removal period specified in the management authorization is generally between October 1 and February 1.
- Monitoring of the nest by a qualified biologist may be required if the project-related activity has potential to adversely impact the nest.

CDFG often allows construction activities that are initiated outside the nesting season to continue without stopping even if raptors such as golden eagles choose to nest within 500 feet of work activities. Thus, work may continue without delay if surveys verify the local absence of nesting golden eagles, or if construction begins outside the nesting period (August 16 through February 28).

- Following construction, SCE and/or its contractors shall survey for and monitor golden eagle nesting sites in the area to ensure that maintenance activities do not disrupt nest sites. Surveys will be performed at the beginning of the nesting season and continue through the nesting season. Consistent with present policy, disruptive maintenance activities will be suspended within 500 feet of active eagle nests until the young eagles have fledged.

SCE shall acquire and/or restore foraging habitat for Swainson's hawk in accordance with CDFG guidelines, set forth in Staff Report Regarding Mitigation for Impacts to Swainson's Hawks in the Central Valley of California (CDFG, 1994), as follows:

> Compensate for permanent foraging habitat losses (e.g., agricultural lands and annual grasslands) within one mile of active Swainson's hawk nests (acreage to be determined during preconstruction surveys) at a 1:1 replacement ratio.

MM BIO 4.4-4: SCE and/or its contractors shall implement the following measures to avoid impacts on nesting raptors and other protected birds for activities that are scheduled during the breeding season (February 1 through August 31):

- No more than two weeks before construction within each new construction area, a qualified wildlife biologist shall conduct preconstruction surveys of all potential nesting habitats within 500 feet of construction sites where access is available.
- If active nests are not identified, no further action is necessary.
- If active nests are identified during preconstruction surveys, a no-disturbance buffer shall be created around active raptor nests and nests of other special-status birds during the breeding season, or until it is determined that all young have fledged. Typical buffers are 500 feet for raptors and 250 feet for other nesting birds (e.g., waterfowl, and passerine birds). The size of these buffer zones and types of construction activities that are allowed in these areas could be further modified during construction in coordination with CDFG and shall be based on existing noise and disturbance levels in the project area

MM BIO 4.4-5: SCE and/or its contractors shall conduct preconstruction surveys and implement measures to avoid impacts to burrowing owls:

- A qualified biologist shall conduct preconstruction surveys for burrowing owls 14 to 30 days prior to the start of each new construction phase, using the most current CDFG protocol. Surveys shall cover grassland areas within a 500-foot buffer from all project construction sites within suitable grasslands habitat, checking for adult and juvenile burrowing owls and owl nests. If owls are detected during surveys occupied burrows shall not be disturbed.
- Construction exclusion areas (e.g., orange exclusion fence or signage) shall be established around occupied burrows, where no disturbance shall be allowed. During the nonbreeding season (September 1 through January 31), the exclusion zone shall extend 160 feet around occupied burrows. During the breeding season (February 1 through August 31), excluding areas shall extend 250 feet around occupied burrows.
- If the above requirements cannot be met, passive relocation of onsite owls may be implemented as an alternative, but only during the nonbreeding season and only with prior CDFG approval. Passive relocation shall be accomplished by installing one-way doors on the entrances of burrows located within 160 feet of the project area. The one-way doors shall be left in place for 48 hours. The burrows shall then be excavated with a qualified biologist present. Construction shall not proceed until the project area is deemed free of owls.

Chapter 2
Management for Nesting Birds

In order to effectively manage nesting birds on the Cross Valley Loop Project it is necessary to outline methods that will protect the biological resources in a manner to avoid nest failures, while also preventing construction delays. The FEIR requires specific disturbance-free buffers from active nests be established within which construction activities are restricted. These requirements are designed to prevent take of active nests, eggs, nestlings, or nesting birds as a result of construction activities. Different species and groups of birds have varying tolerances to disturbance; as such, many birds with potential to nest in the vicinity of the Cross Valley Loop Project approved work areas (e.g., disturbance limits, SCE right-of-way [ROW], access roads, yards) will successfully breed at distances less than the required FEIR buffers. Therefore, it is more effective to establish species-specific, or family/group-specific, recommended buffers that will permit successful nesting, while also reducing constraints on construction activities. This Plan details buffers per species or family/group based on: construction type, activity, and duration; natural history; individual behavior; stage of the reproductive cycle; known tolerances; and site conditions (see Table 2-1 and Attachment B). Bald and golden eagle nest buffers and listed avian species nest buffers as specified in the FEIR and based on informal agency consultation are also addressed in this Plan. Where measures do not coincide, the more stringent measure will be complied with. Various permits, including State and federal incidental take permits, will be acquired for the Cross Valley Loop Project. Although nest buffers for bald and golden eagle and listed avian species is not anticipated to change, this plan may need to be modified based on permitting requirements once those permits are obtained.

This section describes the definition of an active nest, determination and implementation of reduced species-specific or family/group-specific buffers, implementation of nest buffers, nesting bird deterrent methodologies, and the removal of inactive nests.

2.1 Definition of an Active Nest

Active nests of native bird species are protected in the State of California by both State and federal law. At the federal level, the MBTA states

> *"it shall be unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, exported, or imported, deliver for transportation, transport or cause to be transported, carry or cause to be carried, or receive for shipment, transportation, carriage, or export, any migratory bird, any part, nest, or eggs of any such bird, or any product, whether or not manufactured, which consists, or is composed in whole or part, of any such bird or any part, nest, or egg thereof".*

At the State level, California Fish and Game Code Section 3503 states

> *"It is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto."*

California Fish and Game Code Section 3503.5 states

> *"It is unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds-of-prey) or to take, possess or destroy the nest of eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto. "*

While the U.S. Fish and Wildlife Service (USFWS; 2000) has since clarified that the federal regulations do not pertain to inactive nests, the regulations at both the State and federal levels never clearly define what an active (or inactive) nest is. Indeed, many publications in the ornithological literature use the term "active nest", but never precisely define the term. It is likely, therefore, that most authors assume that the term "active nest" is implicit and needs no further explanation. One notable exception regarding raptors, however, is Postupalsky (1974) who defined an active nest "as a nest in which eggs had been laid". This definition was subsequently followed by Baral and Gautam (2007) in a study of vultures in India. From regulatory bodies, the Virginia Department of Game and Inland Fisheries (2010) defined an active Osprey (*Pandion haliaetus*) nest as a nest containing eggs or occupied by dependent (flightless) young.

As written definitions of the term "active nest" are not included in the MBTA or California Fish and Game Code, this Plan will define the term "active nest" as established with CDFG: A nest is an active nest as soon as construction of a new nest or use of an existing nest commences. In most cases, a previously active nest becomes inactive when it no longer contains viable eggs and/or living young and is not being used by a bird as part of the reproductive cycle (eggs, young, fledging young still dependent upon nest). In some cases, a nest can be abandoned by the bird constructing it and become inactive prior to egg laying. In such cases, determination that the nest is inactive is to be made on a case-by-case basis based on consistent observations and the determination of the Avian Biologist. Using this approach, buffers are established around the nest upon nest discovery and/or prior to commencement of construction activities and will remain established until the nest is determined to be inactive by the Avian Biologist or construction activities are complete in the area.

Since a moderate number of avian species never "build" nests, special attention will be provided to the potential nests, known old nests and the behavior of adults of any member of the order Strigiformes, or Caprimulgiformes or familes in the order Falconiformes including Falco, Cathartes, and Gymnogyps.

2.2 Classifications of Construction Activities

The Cross Valley Loop Project will consist of ground and helicopter construction activities. Ground activities can be further classified into four categories: light construction activity; moderate construction activity; heavy construction activity; and earth disturbing activity. These activities are described in greater detail below.

Light construction activities are include, but are not limited to foot traffic, manual labor, hand work and the temporary use of motor vehicles and light construction equipment such as bobcats, manlifts, utility trucks, and/or bucket trucks. These activities are minor in scale and have no- to low- noise disturbance associated with them.

Moderate and heavy construction activities include, but are not limited to the installation and removal of concrete footings, dismantling and installation of structures, etc. Moderate construction activities include large equipment traffic (i.e., graders, bulldozers, cranes, and loaders), loud

construction noise (jackhammers, sawing, generators, etc.), large group meetings and/or offloading of fill or other materials. Heavy construction activities include active dirt moving by large equipment, trenching, repetitive use of large equipment in one area, auguring, demolition of structures, use of cranes, and loud constant construction noise. These activities involve more ground disturbance and increased noise levels in comparison to light construction activities.

Earth disturbing activities include, but are not limited to: grading; scraping; and vegetation alteration (clearing, brushing, tree trimming or removal). These activities involve direct removal of potential nest substrate and generally contain increased noise levels in comparison to light construction activities. However, it should be noted that noise levels associated with earth disturbing activities can be greatly reduced with the use of hand tools.

Helicopters are proposed to be utilized primarily during conductor stringing operations, although other activities may require helicopter use (i.e., delivery of materials, field personnel, and tools). Once wire stringing begins, helicopters are proposed to be in flight daily for a few minutes to either pull in rope or to drop off field personnel and/or material. Wire pulling at each structure will typically take about one week to complete.

2.3 Determination of Species-Specific or Avian Group/Family Specific Buffers

The FEIR describes disturbance-free buffers for active nests (MM BIO 4.4-3, MM BIO 4.4-4, and MM BIO 4.4-5). Buffer conditions and requirements are discussed in more detail in Chapter 1 in Section 1.3.3, FEIR Mitigation Measures. Standard buffers for nesting birds are not specified in the MBTA and the California Fish and Game Code; therefore, species-specific buffers in this Plan are designed to prevent take of active nests while reducing constraints to construction. SCE understands that while various wildlife agencies, research, expert opinions, and experience can provide recommendations and minimal buffer requirements for protected bird species, under the law, no activity shall result in the failure of nest or mortality of a protected species; and SCE will monitor nests with reduced buffers to prevent nest failure.

Table 2-1 presents general reduced horizontal and vertical buffer limits for specific avian groups known to occur in the Cross Valley Loop Project area. This table is based on previous field surveys conducted within the project area; and is therefore not all inclusive, as there may be species that nest in the area that were not anticipated to occur in the area. Should a species not described in the table below be identified, SCE will review the literature provided for that species and utilize a buffer that accurately represents that species in the table. The information within the table is for general assessment only. Appropriate buffers will be determined by qualified Avian Biologists knowledgeable in a range of bird species and experienced in identifying and observing nest behavior in the Central Valley. The Avian Biologist experience and training requirements are discussed in greater detail in Chapter 3 Section 3.1.1, Surveyor Experience and Training. The Avian Biologist will be responsible for determining if the construction avoidance buffer may be decreased or must be increased based on field observation and bird behavior. The duration and frequency of activity in the vicinity of a nest would also be taken into consideration when evaluating whether or not the buffer requirement is met. The distance buffers presented in Table 2-1 are based on construction activities that are temporary or infrequent in nature. If a construction crew will be working in the vicinity of an active nest for an extended period (an extended period can be defined as a few seconds

for blasting, a few minutes for heavy construction or helicopter work, to an hour or more for light construction), then the species-specific buffer may need to be significantly larger depending on the nature of the work.

A Biological Monitor and/or Avian Biologist must be present to look for signs of disturbance of the incubating bird or its mate during all construction activities (light, moderate, heavy, earth disturbance, or helicopter use) scheduled in the vicinity of the nest. If the nesting adult(s) becomes agitated or the incubating bird leaves the nest as a result of the construction activity, then the buffer will be increased beyond the defined buffer per Table 2-1 and will be modified accordingly by the Avian Biologist to protect the bird resource. Additionally, if the bird is not affected by the construction activity, and scientific data allows it, a buffer may be reduced.

Senior technical review, oversight and establishment of the ground, as well as horizontal and vertical helicopter disturbance-free buffers were provided by Peter H. Bloom and H. Lee Jones for the SCE Tehachapi Renewables Transmission Project (Attachment A). The information from this assessment will be used for the Cross Valley Loop Project where helicopter use is required. Together, Bloom and Jones have banded more than 25,000 nestlings of about 60 species and have monitored activities at nests of an additional 30–40 species. Both Jones and Bloom have had extensive experience as avian nest monitors on similar projects, and Bloom is an internationally recognized expert on most aspects of raptor breeding biology.

Horizontal and vertical buffers have been established for helicopter construction work (Table 2-1). In many respects, helicopter construction work is similar to heavy ground-based construction activity. Therefore, the horizontal species-specific buffers established for helicopter construction activity are greater than those for light ground-based construction activity (see Table 2-1, Column 4 and Attachment B). The only exception is for raptors in Category 3, for which a 300- to 500-foot species-specific buffer is adequate under most circumstances for both ground-based and helicopter construction activities. The helicopter species-specific buffers assume that the helicopter will only be present in the area for a very brief period, typically less than a few minutes, and that it will only visit the site once in a day, or once in the early morning and again in the late afternoon (per communication with Construction). This time frame is consistent with most types of anticipated helicopter use on the project.

Vertical species-specific buffers established for helicopter work are also greater than for ground-based construction work (Table 2-1 and Attachment B), although generally not as great as the horizontal helicopter species-specific buffers. The rationale for this is that most bird species sense a greater vulnerability to ground-based disturbances than to aerial disturbances unless the latter are perceived as aerial predators. Indeed, this appears to be supported by some initial data from a previous SCE project (TRTP), where the failure rate for nests where helicopter work was conducted nearby was only three percent (n = 453). None of those failures were directly attributable to the TRTP helicopter work. Nonetheless, the species-specific buffers provided in this Plan may need to be adjusted based on site-specific and nest-specific observations in the field. The vertical species-specific buffers take into account the effects of rotor wash from smaller helicopters, which typically causes a down draft of 15 to 18 miles per hour (mph) at 75 to 150 feet (per communication with Wilson Utility Construction Company, Segments 7 and 8 Construction Contractor for TRTP). Larger-sized helicopters with greater rotor wash could require larger buffers. For exposed nests, vertical buffers will be modified accordingly; however, for nests visually protected by overhead vegetation or structures, as well as nests in cavities, rotor wash is likely to have little additional impact.

It is important to emphasize that species-specific buffers are measured from the nest to the site of the construction activity outwards (horizontally for ground or helicopter activities) or upwards (vertically for helicopter activities), as appropriate, and accounts for the nest's location, including the height of the nest. Consequently, the vertical buffer is measured from nest height and not the ground level. For example, to maintain a vertical species-specific helicopter buffer of 75 feet for a raven nest located on top of a 100-foot tall tower, the helicopter must fly or crane must extend at least 75 feet above the tower (i.e., 175 feet above the ground).

In Table 2-1, some species fall into more than one category and may therefore have more than one species-specific buffer associated with it. A bushtit, for example, nesting in a thicket or understory is less likely to be disturbed than one nesting in a more exposed location in a shrub or small tree even though both nests are the same distance from the construction activity. Likewise, a red-tailed hawk that has acclimated to human activities is less likely to be disturbed at its nest (and thus placed in Birds of Prey Category 2) than one that is not accustomed to human activity (placed in Birds of Prey Category 3). For similar reasons, birds assigned to a category based on their nesting habits are not all likely to have similar thresholds of disturbance. In these instances, a range of species-specific buffers is indicated in Table 2-1. The rationale for these ranges is given in the species accounts (Attachment B).

Buffer reductions will consider known species tolerances for disturbance and is discussed in more detail in Chapter 2, Section 2.4 Implementation of Species-Specific Buffers. Larger buffers are used for large avian species and for species that are not tolerant of disturbance. Likewise, listed avian species require larger buffers that will be adhered to unless consultation and approval from the required resource agencies deems otherwise. Should a listed species not described in the table below be identified, SCE will review the literature provided for that species and consult with the appropriate resource agencies, as required. Smaller buffers are generally used for smaller non-listed avian species and also species that have a high tolerance for disturbance, such as those that are commonly found nesting close to development. Several species have been identified as common species that use the electric power transmission structures or build nests in/on equipment that is stored at a site. These include some red-tailed hawks, common ravens, western kingbirds, Cassin's kingbirds, and house finches.

Attachments A and B provide relevant natural history information for species with the potential to nest in the Cross Valley Loop Project area and their sensitivity to construction. Biological monitors will have this Plan in their possession to refer to individual species to assist in determining appropriate buffers in the field.

Table 2-1. Buffers for Horizontal and Vertical Ground and Helicopter Construction

Avian Group	Species Potentially Nesting within the Cross Valley Loop Project Limits and Survey Area	Horizontal Buffer for Ground Construction (feet)	Horizontal Buffer for Helicopter[1] Construction (feet)	Vertical Buffer for Helicopter[1] Construction (feet)
Waterfowl	mallard, American coot, wood duck, ruddy duck, cinnamon teal, American widgeon, redhead, northern shoveler, Virginia rail, common merganser, sora, Virginia rail common moorhen, gadwall, northern pintail, domestic waterfowl (see note 2), including domesticated mallard (see note 2)	100	300	150
Quail	mountain quail (see note 2), California quail (see note 2)	100	250	200
Herons	green heron, black-crowned night-heron, Great Blue Heron, great egret, snowy egret, cattle egret, American bittern, least bittern	150-250*	500	300
Grebe	pied-billed grebe, eared grebe	150-250*	500	300
Kingfisher	belted kingfisher	100	300	150
Birds of Prey (Category 1)	American kestrel, barn owl, western screech-owl, northern pygmy-owl	300	300	200-300
Birds of Prey (Category 2)	Cooper's hawk, red-shouldered hawk, red-tailed hawk (some), great horned owl, sharp-shinned Hawk, burrowing owl (see note 1)	300	300	200-300
Birds of Prey (Category 3)	turkey vulture, red-tailed hawk (some), northern harrier, long-eared owl prairie falcon,	300 660-1,320	500 660-1,320	300-500 660-1,320
Birds of Prey (Category 4)	Swainson's hawk, white tailed kite, peregrine falcon (see note 1)	1320-2640**	1320-2640**	1320-5280**
Birds of Prey (Category 5)	bald eagle (see note 1), golden eagle	2640-5280** (One mile, can be reduced to 0.5 mile if nest is not within line of sight of construction activities)	2640-5280** (One mile, can be reduced to 0.5 mile if nest is not within line of sight of construction activities)	2640-5280** (One mile, can be reduced to 0.5 mile if nest is not within line of sight of construction activities)
Shorebirds	black-necked stilt, American avocet, Forster's tern, black tern, spotted sandpiper, long-billed curlew (see note 1), whimbrel (see note 1)	200-250*	200-300*	200-300*
Shorebirds	killdeer	125-150*	200-300*	200-300*
Pigeons	band-tailed pigeon (see note 2)	100	200	200

Avian Group	Species Potentially Nesting within the Cross Valley Loop Project Limits and Survey Area	Horizontal Buffer for Ground Construction (feet)	Horizontal Buffer for Helicopter[1] Construction (feet)	Vertical Buffer for Helicopter[1] Construction (feet)
Doves	mourning dove, spotted dove (see note 2)	25-75*	200	150
Roadrunners	greater roadrunner	200	200	200
Nightjars	lesser nighthawk	150	200	150-200*
Swifts	white-throated swift	50-100*	50-200*	50-100*
Hummingbirds	black-chinned hummingbird, Anna's hummingbird, Costa's hummingbird (see note 1)	25-75*	200	75-150*
Woodpeckers	red-breasted sapsucker, Nuttall's woodpecker (see note 1), downy woodpecker, Lewis' woodpecker (see note 1), hairy woodpecker, northern flicker	175	200	150
Woodpeckers	acorn woodpecker	25-75*	100	50
Passerines (cavity and crevice nesters)	Say's phoebe, ash-throated flycatcher, oak titmouse (see note 1), brown creeper, Bewick's wren, house wren, Western bluebird	100	150	100
Passerines (bridge, culvert, and building nesters)	black phoebe, Say's phoebe, northern rough-winged swallow, cliff swallow, barn swallow, house wren, house finch	50-100*	150	100
Passerines (ground nesters, open habitats)	horned lark, lark sparrow, grasshopper sparrow, western meadowlark, American pipit	150	200	150-200*
Passerines (understory and thicket nesters)	Brown-crested flycatcher, Bewick's wren, orange-crowned warbler, yellow warbler (see note 1), common yellowthroat (see note 1), Wilson's warbler, yellow-breasted chat, spotted towhee (see note 1), California towhee, rufous sided towhee, black-chinned sparrow (see note 1), sage sparrow, dark-eyed junco, blue grosbeak, lazuli bunting, Warbling vireo, loggerhead shrike (see note 1), white-crowned sparrow	150	200	150
Passerines (understory and thicket nesters)	Western scrub jay	50-100*	200	150
Passerines (understory and thicket nesters)	bushtit, song sparrow (see note 1), red-winged blackbird, American goldfinch	100	200	150
Passerines (scrub and tree nesters)	western wood-pewee, western kingbird, Cassin's vireo, Hutton's vireo, , bushtit, American robin,	150	200	150

Avian Group	Species Potentially Nesting within the Cross Valley Loop Project Limits and Survey Area	Horizontal Buffer for Ground Construction (feet)	Horizontal Buffer for Helicopter[1] Construction (feet)	Vertical Buffer for Helicopter[1] Construction (feet)
	northern mockingbird, phainopepla, yellow warbler (see note 1), chipping sparrow, western tanager, black-headed grosbeak, blue grosbeak, Brewer's blackbird, hooded oriole, Bullock's oriole, house finch, Cassins Vireo, lesser goldfinch, American goldfinch, Lawrence's goldfinch (see note 1), tree swallow, yellow-billed magpie (see note 1)			
Passerines (scrub and tree nesters)	American crow, common raven	100	200	150
Passerines (tower nesters)	western kingbird, common raven, house finch	50-100*	200	100-300*
Passerines (marsh nesters)	common yellowthroat (see note 1), red-winged blackbird, marsh wren	25-100*	200	75-150*
Passerines (marsh nesters)	tricolored blackbird (see note 1), yellow-headed blackbird,	50-100*	200	150-200*
Species not covered under MBTA.	feral (rock) pigeon (see note 2), chukar (see note 2), Eurasian collared-dove (see note 2), parrots, parakeets, European starling, house sparrow	N/A	N/A	N/A

[1] Buffers are specified for smaller helicopter construction

* Lower limit of the range refers to nests in close proximity to human activity where habituation has been observed; the upper limit refers to nests in more remote areas where human activity is limited.

** Per CDFW recommendation (buffer reduction TBD through case-by-case consultation with CDFW)

Note 1: Some bird species with the potential to occur within the project area are on Birds of Conservation Concern (BCC) 2008 list. The BCC 2008 List, identifies the migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that represent USFWS highest conservation priorities. Special consideration would be taken when evaluation buffer reductions.

Note 2: Quail, waterfowl, Eurasian collared dove, spotted dove, band-tailed pigeon, chukar and other resident and migratory game birds while not protected under the MBTA, are protected by State Wildlife Agency Game Codes, Laws and Regulations; hence considerations for nest protection buffers remain relevant.

2.4 Implementation of Species-Specific Buffers

This section describes the process of implementing species-specific buffers for active nests. Species-specific nesting buffer implementation during construction will be designed to avoid take of an active nest. Buffers implemented for each particular nest may be greater than the buffers detailed in this Plan (Table 2-1). Reduced buffers for raptor and special-status species will be handled on a case-by-case basis and in consultation with the appropriate resource agencies; or within the terms and conditions of permits once acquired. Implemented buffers for non-raptor, non-special-status species may be reduced to smaller buffers then the distance established in the Plan, as determined by an Avian Biologist and without CDFG concurrence, if the bird is exposed to routine public

interaction and demonstrates desensitization to disturbance. Reduction of buffers below the buffers identified in the Plan is discouraged.

The following describes the roles and responsibilities of the persons discussed in this Plan in determining active nests and implementing the appropriate reduced buffers.

- **Avian Biologist:** searches and identifies active bird nests; makes recommendation of appropriate buffer reduction distances and communicates this to the SCE Project Biologist; may also recommend indirect impact reductions, such as establishing no parking/stopping/loitering zones; involved in determining when a nest is no longer active based on personal observations or those of the Biological Monitor; maintains the Bird Nest Events in the Field Reporting Environmental Database (FRED). May also install any required Environmentally Sensitive Area (ESA) staking and fencing around the active nest.
- **Biological Monitor:** Installs any required ESA staking and fencing around the active nest following guidance provided by the Avian Biologist and the SCE Project Biologist; actively monitors the nest and adjacent construction activities; conducts regular sweeps to search for and identify additional nests; communicates regularly with the Avian Biologist about any nesting bird behaviors observed; and creates new and updates existing Bird Nest Events in FRED.
- **SCE Project Biologist:** evaluates and approves Bird Nest Events in FRED and buffer reductions to be implemented per this Plan; will be the sole contact with CDFG and USFS regarding active nests and reduced buffers; regularly reviews and critiques the FRED nesting bird database (i.e., Bird Nest Events) and submits it to CDFG and USFWS.

When an active nest is discovered, the Biological Monitor will delineate and restrict construction per the standard buffer as an ESA per the FEIR and applicable permit conditions. The biological monitor will document the following information:

- Construction type, activity, and duration
- Individual behavior of the bird
- Stage of the reproductive cycle
- Site conditions

An approved Avian Biologist will be consulted and will determine if a reduced species-specific buffer can be applied to the active nest. The Avian Biologist will make this determination based on:

- Information provided by the Biological Monitor (see above)
- Species' natural history
- Species' known tolerances

If a reduced species-specific buffer can be implemented, the SCE Project Biologist will be consulted prior to the reduction of the standard buffer. Buffer reductions will take place only after consideration of site-specific conditions such as:

- Distance to construction
- Type and anticipated duration of construction

- Microhabitat at the location of the nest that may provide visual and acoustic barriers (i.e., terrain)
- Behavior of the pair
- Reproductive stage

For ground-based construction activities, vertical separation of the nest from the construction area will be considered when selecting the appropriate horizontal buffer. Some species build their nests very high in trees and structures. For example, a common raven nest 150 feet off the ground in an existing structure is less likely to be affected by ground work occurring directly below than a nest 50 feet off the ground. The horizontal and vertical buffers will be implemented using the guidelines as described in this Plan.

The habitat and infrastructure surrounding a nest location will be evaluated for its ability to provide a visual and/or acoustic barrier to construction. This information will be used to help determine an appropriate buffer. As an example, a more concealed nest may require a smaller buffer than a nest that has a direct line of sight to construction.

The observed behavior of an individual bird during the nest search process and consequent nest monitoring will help determine the appropriate buffer distance. For example, an incubating adult that appears more skittish and is readily disturbed could receive a larger buffer than an incubating adult that sits tight and appears more acclimated to disturbance.

Generally, nesting birds are most susceptible to failure early in the nesting cycle when fewer resources have been invested towards the nest. Therefore, it is more important to reduce disturbances during egg laying rather than later in the nesting cycle, which could result in the determination of a larger buffer being necessary early on, then reducing its size later in the nesting season.

Extreme weather events may produce conditions that would increase the likelihood of nest failure. Combined with the stress of nearby construction activity, a nest might fail that would otherwise succeed. On unseasonably hot or cold days, species-specific buffers may need to be temporarily increased. It is presumed that construction activities would not take place during heavy storm events.

A nesting bird database (FRED) will eventually be maintained for all nests identified within active Cross Valley Loop Project construction areas. At a minimum, for each nest, the following information will be documented:

- Status (active or inactive)
- Species
- Nest location
- Behavioral observations
- Site conditions
- Estimated date of nest establishment
- Estimated fledge date
- Buffer size implemented

To avoid the take of active nests in active construction areas, the Avian Biologist or Biological Monitor will implement and maintain the established ESA buffer, monitor adjacent construction activities, and document the nesting birds' behavior observations and active nest status. SCE will ensure that the Construction Contractor will be made aware of the ESA buffers through the use of construction maps outlining environmental and biological constraint areas, flagging, staking and signage, and in-the-field communication.

Additionally, in accordance with MM BIO 4.4-3, nesting sites will be surveyed and monitored one year following construction to ensure that maintenance activities do not disrupt nest sites.

2.5 Buffer Distances for Unpaved Access Roads

Substations, material storage yards, helicopter assembly and support yards, contractor yards, and construction areas associated with the Cross Valley Loop Project may be accessed by a single ingress/egress point. These access roads into construction areas are frequently located adjacent to vegetation (e.g., shrubs and trees), including vegetation planted to screen substation facilities that provide suitable nesting habitat for birds. Implementing buffers for active nests that become established along unpaved access roads may restrict access to and from construction activities within substations and yards. Buffer restrictions will not be established along paved roads, since these roads are regularly utilized by the public and have a higher frequency of disturbance associated with them.

Ingress/egress to the project work areas will be managed to avoid take of an active nest while allowing use of these roads for construction activities. Take of an active nest from vehicular travel along project access roads can be avoided through the implementation of the following management practices:

- The areas along unpaved access roads will be surveyed by the biological monitor to document locations of active nests and to assess buffers,
- The speed limit along project access roads will be restricted to 15 mph or less,
- Vehicles will not stop or idle along project access roads within an active nest buffer,
- Monitors/biologists will place no parking/idling/stopping signs and ESA staking/flagging along the road at the limits of nest buffers to avoid impacts,
- Construction personnel will not loiter through or within an active nest buffer, and
- Watering of access roads for dust control will be limited to prevent direct watering of an active nest within active nest buffers.

2.6 Active Substations and Yards

Once construction or clearance of vegetation for a yard or substation is complete and the yard or substation is established and is in active operation, no buffers for non-listed species' nests found inside or outside of the yard or substation will be implemented inside the yard or substation perimeter. All nesting issues regarding listed species will be handled on a case-by-case basis and in consultation with the appropriate resource agencies; or within the terms and conditions of permits

once acquired. Buffers and reduced buffers for nests inside of yards and substations will not be necessary for non-listed species due to acclimation to the regular construction activities. Indirect impacts to the individual nests are not anticipated as work will occur within the yard or substation only. However, if a major change in the activity level or activity type within the yard or substation will occur, there may be situations where appropriate nest buffers will be implemented within the yard or substation specific to that activity. Examples may include helicopter use or mobilization of a large piece of equipment, where the Avian Biologist determines it is not reasonable to assume the individual is acclimated to the activity. In these situations, these types of activities may occur within the yard or substation but outside the nest buffer.

2.7 Nesting Bird Deterrent Methods

This section details nesting bird deterrent methods and examples that can be used for the Cross Valley Loop Project. SCE's nesting bird management strategy for the Cross Valley Loop Project will include nesting bird deterrent methods within and adjacent to active construction areas, including substations and yards. Through the implementation of nesting bird deterrent methods within and adjacent to active construction areas, the potential of an active nest to restrict Cross Valley Loop construction will be reduced. Effective nesting bird deterrent methods within active construction areas will reduce the likelihood that Cross Valley Loop construction will result in the take of an active nest. Installation and maintenance of exclusionary devices by the SCE or Construction Contractor will not represent a violation of the MBTA, California Fish and Game Code, or FEIR mitigation measures, permits, and regulations as long as such activities do not result in the take of an active nest.

Nesting bird deterrent methods may include the following:

- Removing all vegetation from the active construction area prior to or early within the nesting season;
- Removing, moving, and securing equipment, vehicles, and materials on a daily basis within an active construction area;
- Installation of appropriate-sized mesh netting on construction equipment and materials in material storage, helicopter assembly and support, and contractor yards, or other Cross Valley Loop Project facilities or work areas;
- Use of wire spikes placed on towers, substations, or other facilities to discourage birds from perching and nesting on these structures;
- Installation of visual deterrents such as tangle guard bird repellent ribbon in active construction areas, yards, substations, and on materials and equipment;
- Covering straw wattle and other potential nesting materials in active construction areas, yards, and substations ;
- Wrapping, stuffing, or covering ends of pipes or other materials within which birds could nest;
- Use of colored gravel, such as red or white, in active construction areas, yards, and substations; and/or

- Managing construction yard trash in a manner to reduce potential point food sources in active construction areas, yards, and substations.

Specific locations for the use of exclusionary or deterrent devices will be determined in coordination with the SCE Project Biologist and the SCE or Construction Contractor. The SCE or Construction Contractor is responsible to furnish labor and materials for bird exclusion or deterrent devices unless otherwise directed by SCE. Bird exclusion or deterrent devices shall be installed, maintained, and removed according to product specifications by the SCE or Construction Contractor as directed by an SCE Biologist.

Nesting Habitat Reduction. Removing potential nesting habitat is the first component to effectively excluding nesting birds within a construction area. To the extent feasible, prior to the onset of the nesting bird season, construction areas should be cleared of vegetation and grubbed as appropriate to reduce potential conflicts between construction activities and nesting birds during the nesting season. Vegetation removal will typically include removal of trees, shrubs, and herbaceous species. Prior to vegetation clearance, an Avian Biologist will conduct a preconstruction survey to confirm the absence of nesting birds, including raptors, and year-round residents, such as burrowing owl (see Chapter 3).

Mesh Netting. Use of mesh netting to cover equipment, stored materials and equipment, and partially constructed facilities can be a very effective means to exclude birds from suitable nesting sites within construction areas. By preventing birds from accessing potential nesting sites within the construction areas, conflicts between nesting activities and construction and yard operations can be reduced.

Netting can be specially ordered for this purpose from a number of companies including: USA Bird Control (http://www.usabirdcontrol.com/), Nylon Net Co. (http://www.nylonnet.com/), and Nixalite (http://www.nixalite.com/birdnetting.aspx). An example of a specification sheet for such netting (PollyNet™) is included as Attachment C.

The size of the mesh grid can vary depending on the size of birds that are being excluded. Given the diversity of birds that could nest within construction areas throughout the Cross Valley Loop Project, a 0.75-inch sized mesh may be suitable for excluding most birds, including small birds such as house finches and swallows.

Mesh netting, if employed, must be installed and maintained by the SCE or Construction Contractor according to manufacturer specifications. To increase the effectiveness of the mesh netting as a bird exclusion device, equipment or other objects should be completely covered leaving no gaps in the netting through which birds could enter and build a nest under the netting. Mesh netting should also be inspected regularly by the SCE or Construction Contractor to identify and repair any rips or gaps in the netting that could permit birds to pass through and to look for wildlife that have become trapped in the netting. If the SCE or Construction Contractor observes wildlife inside or trapped in the mesh netting, the biological monitor will be contacted immediately. The biological monitor will also inspect netting during monitoring to ensure that birds or other wildlife have not become trapped under the netting. Lizards and snakes are especially prone to becoming entangled in excessive netting draped along the ground.

Bird Spikes. Use of plastic or stainless steel spikes can be effective in discouraging birds from landing on structures and deter nest establishment. Bird spikes typically consist of groupings of stainless steel or UV-resistant polycarbonate spikes that are spaced in such a way as to prevent

birds from landing and gaining a foothold on the surface to which the spikes are adhered. As birds cannot comfortably land on surfaces covered with the spikes, the likelihood that birds will attempt to build nests in these areas is low.

Bird spikes can be specially ordered for this purpose from a number of companies including: USA Bird Control (http://www.usabirdcontrol.com/) and Bird-B-Gone (http://birdbgone.com/). An example of a specification sheet for such bird spikes (Bird-B-Gone™) is included as Attachment D. Bird spikes, if employed, must be installed and maintained by the Construction Contractor according to manufacturer specifications.

Bird spikes are designed to be affixed to structures to provide longer-term deterrents to birds. Therefore, use of bird spikes may be more practical to deter nesting on structures like towers and substations. Such devices are not likely practical for use on equipment, material storage areas, or contractor yards. Installation of bird spikes on tower structures concurrent with structure construction may discourage birds from nesting on tower structures during construction. Because they are affixed to structures, maintenance of bird spikes is low; however, these devices must be replaced periodically per the product specifications to maintain effectiveness.

Visual Deterrents. There are a wide range of visual deterrents that can be used to discourage birds from nesting. These range from predator decoys (e.g., plastic owls) to reflective ribbon that provides visual and auditory discomfort to birds. Reflective ribbon such as Tangle Guard Bird Repeller Ribbon (http://www.nixalite.com/tangleguard.aspx, Attachment E) is a Mylar reflective ribbon that can be affixed to construction equipment, around the perimeter of storage yards, or on towers or other facilities, as appropriate, to scare birds from the area, thereby reducing the likelihood of nesting. Movement from wind action produces a metallic rattling sound and its holographic surface may be construed as menacing to birds. Use of reflective ribbons can be particularly effective in material storage yards and contractor yards that may be used for a long period of time. Holographic reflective ribbons can be specially ordered from a number of companies including USA Bird Control.

Material and Pipe Covers. Sheltered spaces such as pipes or stacks of stored materials provide potential nesting sites for some birds. To reduce the likelihood that birds will build nests in these areas and therefore constrain the use of construction areas, substations and yards, such materials can be covered with mesh netting (discussed above) or other materials. Routinely covering equipment and stored materials is a standard management practice that can be effective to deter birds from nesting in these areas.

Yards often contain suitable nesting materials or opportunities for birds, especially for cavity nesting. For example, straw waddles can be attractive to birds as they provide excellent nesting material for a wide range of species. Birds attracted to this nest material may be more likely to build a nest in close proximity to these stored materials (e.g., within a yard), which can constrain work activities. To reduce the likelihood for nesting with yards where waddles are stored, such materials should be covered so birds cannot access the waddle material to use as nesting.

Colored Gravel. Use of colored gravel in construction areas that would typically be rocked and maintained for a long term (e.g., yards and substations) can be effective in discouraging ground nesting birds. The eggs of ground nesting birds are colored in a manner to be camouflaged against naturally colored substrates such as soil or pebbles. By covering the ground surface with colored gravel that contrasts sharply with the color of the birds' eggs, ground nesting birds can be effectively discouraged from nesting in such locations.

Trash Management. Although not a specific deterrent, management of trash on and around construction areas is important to reduce the potential for construction activities to attract birds. Trash from food waste can provide an attractive food source for birds thereby increasing the likelihood of them nesting within construction areas. Effective management of food waste and other trash will be important to avoid attracting birds to construction areas. Such management measures could include daily removal of trash from the site as well as covering trash bins with tightly fitting lids.

These methods, either on their own or in combination with other measures discussed above, can be effectively employed to discourage birds from potentially nesting within and immediately adjacent to construction areas. However, there is no single practical method to permanently exclude birds from construction yards, staging areas, or transmission structures. Knowledge of bird behavior and interactions and adaptive management in collaboration with the Construction Contractor is essential in understanding the implementation and effectiveness of deterrents.

2.7.1 Inactive Nest Management

This section of the Plan discusses the protocol to remove inactive nests in compliance with MBTA or California Fish and Game Code in active construction areas, including yards, substations, and materials and equipment. As described in Section 2.1 above, a nest becomes active once construction of a new nest or use of an existing nest commences. In most cases, a previously active nest becomes inactive when it no longer contains viable eggs and/or living young and is not being used by a bird as part of the reproductive cycle (eggs, young, fledged young still dependent upon nest). Only inactive nests that will be directly impacted by Cross Valley Loop construction activities are eligible for removal. For example, an inactive nest on a nearby structure that will not be directly impacted by construction activities will not be removed. This protocol does not cover listed species or bald or golden eagles. All nesting issues regarding listed species or bald or golden eagles will be handled on a case-by-case basis and in consultation with the appropriate resource agencies; or within the terms and conditions of permits once acquired. The purpose of inactive nest removal is to prevent or reduce the potential reuse of a currently inactive nest (e.g., return of a pair to the specific site) in a problematic location. In addition, as part of SCE's routine operation and maintenance (O&M), nests that pose an imminent threat to SCE facilities will be removed pursuant to existing permits/agreements with resource agencies and are not the subject of this Plan.

The MBTA specifically protects migratory bird nests from possession, sale, purchase, barter transport, import, and export, and take. For nests, the definition of take per 50 CFR 10.12 is to collect. Based on the Migratory Bird Permit memorandum issued by the USFWS on April 15, 2003, "the MBTA does not contain any prohibition that applies to the destruction of a bird nest alone (without birds or eggs), provided that no possession occurs during the destruction."

Nests are also protected by the California Fish and Game Code in the following ways:

- CESA: take is not authorized for endangered species. Removing a nest of a listed species has the potential to result in take and cannot be done unless an incidental take permit (ITP) has been issued by CDFG. For the purposes of this Plan, inactive or partially completed nests of threatened and endangered species will not be removed. Listed and protected bird species with the potential to occur in the Cross Valley Loop Project are golden eagle, California condor (although they are not known to nest along the Cross Valley Loop Project alignment), burrowing owl, least Bell's vireo, southwestern willow flycatcher, and Swainson's hawk.

- California Fish and Game Code section 3511 – Fully Protected Species: take is not authorized for fully protected species. For the purposes of this plan, inactive or partially completed nests of fully protected species will not be destroyed. The golden eagle and California condor are fully protected bird species with the potential to occur in the Cross Valley Loop Project area.
- California Fish and Game Code sections 3503, 3503.5, 3505, 3513, 3800, 3801.6– Native Birds: sections of the California Fish and Game Code protect all birds, birds of prey, and all nongame birds, as well as their eggs and nests, for species that are not already listed as fully protected and that occur naturally within the state of California. Section 3503.5 specifically states that it is unlawful to take any raptors (e.g., hawks, owls, eagles, and falcons) or their nests and eggs.

Based on the Migratory Bird Permit Memorandum (USFWS 2003), inactive nests are defined as nests without birds or eggs. If a bird is sitting on eggs or sign and bird activity is such that the nest could be interpreted as active, removal will be considered take and would be in violation of the MBTA and/or California Fish and Game Code. An alternative course of action may be determined by the resource agencies on a case-by-case basis; however, this is not the subject of this Plan.

The following sections describe inactive nest removal for non-listed, non-bald or golden eagle raptors, colonial bird species, other non-listed, non-game native birds, and listed bald or golden eagles. Active nests outside of the construction area will be protected through establishment of above-mentioned buffers to avoid the take of an active nest, as discussed in other sections of this Plan. All inactive nest removals for the Cross Valley Loop Project will be documented.

2.7.1.1 Non-Listed, Non-Bald or Golden Eagle Raptors

Raptors have additional protection under the California Fish and Game Code and many of them do not "build" nests. Since raptors exhibit nest site fidelity, inactive raptor nests may be protected even though no eggs or young are present. The removal of inactive raptor nests may still qualify as take and be in violation of the MBTA and the California Fish and Game Code. Inactive or partially built raptor nests will be documented by the biological monitor.

In accordance with CDFG communications and per the California Fish and Game Code, inactive raptor nests that will be impacted directly by Cross Valley Loop Project construction activities will be removed according to the following protocol:

- The Biological Monitor/Avian Biologist will observe the nest for four consecutive hours or for consecutive two hour periods over two successive days to determine if there is any activity at the nest site. This time may be reduced if visual evidence definitively determines the status of the nest (active or inactive).
- If the Avian Biologist determines that the nest is unlikely to be active based on these observations, the Cross Valley Loop Project will provide personnel to inspect the nest if it is not accessible by the Biological Monitor/Avian Biologist due to safety concerns;
- For inaccessible nests, the SCE or Construction Contractor will take a photo of the nest contents and provide the photograph to the Biological Monitor/Avian Biologist;
- Once the Biological Monitor/Avian Biologist has confirmed from the photo that the nest is inactive, the SCE or Construction Contractor will remove the nest;

- The Biological Monitor/Avian Biologist will dismantle the nest and disperse the materials in the immediate area.

Nests will not be collected or taken off site by biologists because this would be in violation of the MBTA and Native Bird sections of the California Fish and Game Code.

If necessary and feasible, nest platforms may be constructed according to SCE-provided guidelines (see Attachment F).

Removal of all inactive raptor nests will be documented on a daily and weekly basis in the form of SCE Cross Valley Loop Project daily and weekly monitoring reports in the FRED database.

Burrowing Owl

Burrowing owls nest in burrows in the ground and may be non-migratory, meaning that burrows may be utilized (i.e., occupied) year-round as escape burrows. Additionally, because they nest in burrows in the ground, further surveys may be required (per the California Burrowing Owl Consortium guidelines [CBOC 1993]) to determine whether or not their nest burrows are active or their escape burrows are being used.

As prescribed in the FEIR (MM BIO 4.4-5), preconstruction surveys will determine the presence/absence of suitable habitat (i.e., burrows) for burrowing owl occupation and/or nesting.

Management of active burrowing owl nests will be addressed in the burrowing owl management plan developed for the Cross Valley Loop Project. This plan is provided as Attachment G.

2.7.1.2 Colonial Bird Species

Based on the Migratory Bird Permit Memorandum (USFWS 2003), colonial nesting birds (which include swifts, and swallows) are highly vulnerable to disturbance. Destruction of unoccupied nests during or near the nesting season could result in take.

Outside the nesting season, CDFG and USFWS will be consulted regarding removal of colonial bird species' inactive and partially built nests. Inactive nests of colonial bird species will be removed or collapsed upon approval from CDFG and USFWS.

During the nesting season, colonial bird nests that will be impacted directly by Cross Valley Loop construction activities will be removed according to the following protocol.

- A Biological Monitor/Avian Biologist will determine if the nests are active through observation of bird sign and behavior.
- The SCE or Construction Contractor will provide personnel to inspect the nests and take a photograph of the contents if they are not accessible by the Biological Monitor/Avian Biologist.
- If the Biological Monitor/Avian Biologist determines the nests are not active, CDFG and USFWS will be consulted regarding removal of colonial bird species nests. Nests will be removed or collapsed upon approval from CDFG and USFWS.
- The Biological Monitor/Avian Biologist will dismantle the nest and disperse the materials in the immediate area.

Nests will not be collected or taken off site by biologists because this would be in violation of the MBTA and Native Bird sections of the California Fish and Game Code.

2.7.1.3 Non-Listed, Non-Game Bird Species Nest Removal

Removal of non-listed, non-game bird inactive nests for species other than raptors and colonial bird species will be completed as discussed below. Only inactive nests that will be directly impacted by Cross Valley Loop construction activities will be removed. The USFWS and CDFG do not need to be notified prior to removal of these inactive nests when they are removed in compliance with Federal and State regulations.

Inactive nests found within construction areas, including substations, yards, materials and equipment, will be removed and dropped to the ground. The SCE or Construction Contractor will provide personnel to inspect the nest and take a photograph of the contents if it is not accessible by the Biological Monitor/Avian Biologist. Nests will not be collected or taken off site by biologists because this would be in violation of the MBTA and the California Fish and Game Code.

When construction takes place during the nesting season, inactive nests will be identified during preconstruction surveys and during construction monitoring, if not previously identified during earlier project- or non-project SCE surveys or monitoring. To determine if a passerine nest is inactive, a minimum of one uninterrupted, consecutive hour of monitoring in suitable conditions is required prior to removal. This time may be reduced if visual evidence definitively determines the status of the nest (active or inactive). The SCE or Construction Contractor will provide personnel to inspect the nest and take a photograph of the contents if it is not accessible by the Biological Monitor/Avian Biologist. After the Biological Monitor/Avian Biologist confirms that the nest is inactive and that it does not belong to a listed species, the nest will be removed within the immediate area per the three scenarios below.

- If a nest is determined to be inactive within a work area (directly impacted), the nest can be immediately removed, dismantled, and scattered onsite.
- If a fully constructed nest is determined to be inactive because it has fallen out of its original location or been abandoned, the nest is to be removed and placed outside the construction zone.
- If a failed nest (with non-viable, unhatched eggs or dead young) is determined to be inactive within a work area, the nest with eggs/young is to be removed and placed outside the construction zone.

No nests will be taken off site or collected because this is in violation of the MBTA and the California Fish and Game Code. The nest location will be subsequently monitored to detect any re-nesting attempts.

2.7.1.4 Listed, Fully-Protected, Bald or Golden Eagles

All nest removal issues regarding listed species, fully-protected, or bald or golden eagles will be dealt with on a case-by-case basis and in consultation with the appropriate resource agencies; or within the terms and conditions of permits once acquired.

Chapter 3
Field Approach

Nesting bird surveys will be carried out in several stages during the nesting season (February 1 through August 31). A preconstruction survey for biological resources that includes a survey for nesting birds in areas of suitable habitat to support Swainson's hawk, bald or golden eagle, or burrowing owl will be conducted within 30 days prior to the start of construction. Additionally, a clearance sweep will be conducted within 14 days prior to the start of work, and the results will be valid for seven days during the nesting season and 14 days in the non-nesting season. Lastly, on the first day of each new phase of construction and for each day during construction during the nesting season, the biological monitor will perform daily sweeps to look for resources, including nesting birds. The daily sweeps will be conducted to identify new nests (partially built, active, or inactive) not detected during the preconstruction survey or clearance sweep and to also document the status (active or inactive) of known nests in a construction area. The preconstruction survey, clearance sweep, and daily sweeps will be conducted within suitable habitat for nesting birds within the construction areas and include a 500-foot survey buffer, collectively referred to as the Biological Survey Area (BSA). Care will be taken to avoid potential take of a nest due to surveying and monitoring efforts. The status of all active nests within the BSA will be documented and summarized in monthly reports and the monthly nesting bird table.

3.1 Survey Requirements

3.1.1 Surveyor Experience and Training

Avian Biologists and Biological Monitors, hereafter collectively referred to as surveyors, will be CPUC-approved and sufficiently skilled and experienced with the identification of all relevant avian species by both sight and sound and their nesting requirements, to conduct accurate and efficient surveys. As different species have different nesting niches and different breeding strategies, surveyors must be able to readily distinguish species that may breed locally from those that do not and know the habitat contexts and types of behaviors to look for when evaluating nesting potential. For example, surveyors must know whether the species normally nests on the ground or high in trees, or whether only females construct the nest, in which case watching the male would be counterproductive. Attachment A contains a list of the potential nesting bird species and relevant information on their nesting. Surveyors will receive training on the information and procedures detailed within this Plan. This list draws on information presented in Baicich and Harrison (1997), Kiff and Irwin (1987), and the online *Birds of North America* (http://bna.birds.cornell.edu/BNA/), as well as SCE's Biological Consultants' extensive experience surveying for and studying nesting birds in southern California.

3.1.2 Field Maps

Maps showing the project disturbance limits, ROW, access roads and other project features and current nest and buffer data are available on demand and will be available in the FRED database once established for the project. Detailed maps will also be generated by SCE based on available

project data. Surveyors will have access to the FRED database to view all previously collected data. The database and associated mapping interface will be regularly updated so real-time biological resource data, including nests, will be available to the surveyor.

3.1.3 Required Field Equipment

At a minimum the surveyor will have the following equipment/documents:

- Binoculars
- Stakes and red and white striped flagging (required to denote ESAs) and permanent marker (Sharpie®) for writing on the flagging
- Data recording equipment (surveyors will have a mobile smartphone and/or a GPS for gathering nest data and UTM coordinates; and nest data will be entered into FRED once established)
- Maps (printed or digital) depicting the BSA
- Compass
- Digital camera
- Copy of the approved SCE Cross Valley Loop Project Nesting Bird Management Plan and any other required project documents (e.g., monitoring forms and permits)

3.2 Survey Methodology

A survey visit will consist of a pedestrian search by a surveyor for both direct and indirect evidence of bird nesting. Direct evidence will include the visual search of an actual nest location. Indirect evidence will include observing birds for nesting behavior, such as copulation, nest building, adult agitation or injury feigning, feeding chicks, removal of fecal sacks, and other characteristic behaviors that indicate the presence of an active nest. The size of the survey area will vary on site specific conditions. Ideally the surveyor should be able to survey a substantial portion of the perimeter from one inconspicuous location to detect birds entering and leaving the survey area. Much of the surveyor's time will require sitting quietly in inconspicuous locations when other types of disturbance are absent; and intensively listening and observing all bird behaviors for discernable direct and indirect evidence of nesting. When moving through vegetation, surveyors will watch for distraction displays, aggressive responses and interactions, and birds flushing suddenly from atypically close range (often an indicator of a nest site). If defensive or distraction displays from birds are observed, an active nest is likely to be nearby. Surveyors will utilize visual observations of nests and bird behavior as a method for detecting potential nests.

Nests that pose constraints to the Cross Valley Loop Project will be directly observed or inferred by behaviors such as feeding chicks or removing fecal sacs. If the presence of a potentially active nest is suspected but cannot be confirmed, additional surveys will be conducted. SCE Project Biologists will be notified of all active and potentially active nests detected during the preconstruction surveys and sweeps.

Once a nest is found, it will be approached to check the status. If no adult or juvenile bird activity is observed within one hour (four hours for raptor nests), the nest can be considered inactive. This

time frame may be reduced if visual evidence definitively determines the nest status (active or inactive). If the nest will be directly impacted by Cross Valley Loop Project activities, then the removal procedures outlined in Section 2.7.1 of this plan will be implemented. If the surveyor determines that an hour (or four hours for raptors) is not sufficient to make a determination on the nest status, then one hour increments will be employed until a final determination regarding nesting status can be made. Every effort will be made as to not expose the nest to potential predation as a result of survey and/or monitoring activities. All nest visits will be conducted by a single surveyor and will last only as long as necessary to check the nesting stage or until circumstances necessitate departure (e.g., potential nest predator detected or sustained indications of stress by any protected bird).

When approaching a nest, surveyors will first determine whether there are any potential nest predators nearby (e.g., western scrub-jays [*Aphelocoma californica*], common raven [*Corvus corax*], American crow [*Corvus brachyrhynchos*], house wren [*Troglodytes aedon*] or female brown-headed cowbirds [*Molothrus ater]*). If no predators are observed, the surveyor will approach the nest. Surveyors will be carefully aware of the possibility of additional, undetected nests nearby. They will avoid creating a scent or visual path that directs animals to the nest (e.g., leaving no trampled spot by the nest and continuing past the nest upon leaving it rather exiting on the entrance path). Surveyors will also briefly look in at least two empty potential host plants for bird nests before and after looking in the nest in an attempt to deter predators.

3.2.1 Active Nests

When an active nest is confirmed, the species-specific buffer will be implemented per the Plan and Avian Biologist's discretion and work within the new nest buffer will cease immediately. If a bird is seen building a nest or feeding nestlings, but the vegetation is too dense for the surveyor to visually locate the nest, the approximate nest location will be inferred by the surveyor based on observed bird behaviors. Surveyors are not to risk the failure of a nest in an effort to discern an exact location or exact status (e.g., number of eggs, size of nestlings, etc.). The surveyor will then observe the nest and the parental behavior to determine if a reduced buffer can be implemented. Active nests will be monitored before implementing a reduced buffer. Prior to implementation, all buffer reductions will require the approval of an SCE Project Biologist.

A nest completion date can be estimated by combining the stage of nesting at discovery and the known nesting stage range. However, since the date will be estimated, it is important to note that a nest may be active for a shorter or longer period of time. For altricial species, a time buffer from three days up to three weeks will be added to every nest to allow for post-fledging nest dependence.

3.3 Reporting

Daily and weekly biological monitoring reports will be generated for the Cross Valley Loop Project. All data collected daily will be input from the field on hard copy paper forms or mobile smartphones using an offline form, and then entered/uploaded online into FRED, once established. A nesting bird table, updated monthly for submittal to the CPUC and CDFG, will show the following:

- Current status of all active nests within the construction areas
- Distances of disturbance-free buffers that have been implemented to avoid nest failures

- Proximity to active construction activities
- Estimated fledge date

3.3.1 Data Sheets

Once FRED is established for the Cross Valley Loop Project, all nesting bird data will be entered into FRED Bird Nest Events (online forms). This will provide the SCE Project Biologist, Avian Biologist, and Biological Monitor current information pertaining to that nest, as well as the ability to print maps with the nest data (nest location and buffers). The data fields that have been established in FRED for previous projects are defined in Table 3-1. These data fields are subject to change based on the establishment of FRED for the Cross Valley Loop Project and may be updated at a later date.

Table 3-1. Field Definitions for Online Entry into FRED

Field	Explanation
Date	Use calendar icon to choose date.
Time	Time (defaults to time of data entry).
Nest Number	A unique identifier entered by the surveyor. The name will consist of the surveyor's initials and a number. For example – KF1.
Lead Monitor / SME	SCE Project Biologist Name
Surveyor	Surveyor's name.
Segment	Pull-down menu for the segment numbers.
GPS Coordinates UTM (meters)	Collected in latitude and longitude. Make sure that measuring device (Garmin etc…) is set to proper units. Zone:___ ; N or S ; _____mE and _____ mN
	Ground Buffer Radius in feet. "O" for no buffer drawn
	Helicopter Buffer Radius: in feet.
Buffer Implemented	Yes or No
Device Type	Pull-down menu choices are: "Garmin/Other-Recreational Grade (+/-40')", Smart Phone w/GPS-Advanced Recreation Grade (=/-10-15')", Trimble (Yuma)/Other-Professional Resource Grade (+/-1-3metter)", Trimble (GOXH)/Engineering Survey Grade (Sub Meter accuracy)", "Launched From Map", and "Device Unavailable"
Species	Pull-down menu based on the four-letter codes defined in Attachment A.
Offset	Check box for noting if the nest is offset from the GPS coordinates.
Direction	Pull-down menu of eight directions.
Distance in meters	How far the nest is from the GPS coordinates (in feet).
Nest Location Description	Where is the nest (specific description)? Be specific…. anything that can help another person finds the nest; i.e., nest within top half of the oak tree or nest is located within a rocky outcrop. Use descriptive words. TAKE A PICTURE of the nest, at least one overview and one close-up.
Nest status	Pull-down menu with "Nest Building," "Active," or "Inactive" as selections. Nest building is a nest that is being constructed but that does not contain eggs. Active is a nest with eggs, nestlings, or recent fledglings. Inactive is a nest that no bird is currently using.
Number of Eggs	If able to observe eggs, number of eggs observed.
Number of Chicks	If applicable, number of chicks observed in nest.
Estimated Fledge	General estimate of how long the nest has if goes to fledgling.

Field	Explanation
date	Use Attachment A for reference.
Nest Activity	Information on activity/behaviors observed. Pull-down menu with "Feeding Chicks", "Fledglings close to nest" (i.e. branching), "Incubation", "Nest Building", or "No Activity Observed".
Height from Ground in Feet	How high is the nest from the ground measured in feet.
Distance From Work Area in Feet	Approximate distance from nest to the active work area in feet.
Distance From Access Road in Feet.	Approximate distance from the nest to the access road in feet.
Substrate/Species	What is the nest in (e.g. host plants species, structure, bridge, and ground)? TAKE PICTURES from at least three directions.
Nest Name	A unique identifier entered by the surveyor. The name will consist of the surveyor's initials and a number. For example – KF1.
Location Description/Habitat	General area of the nest in relation to the surrounding vegetation/unique features. Be specific… anything that can help another person find the nest. i.e.: nest is located x-feet north/northwest of access road. Or, nearest street address, cross streets etc. TAKE A PICTURE.
Is there an offset?	Are the measurements skewed from the actual location of the nest?
Offset Directions	Pull-down menu options are: "N", "NE", "NW", "S", "SE", "SW", "E", OR "W".
Offset Distance in feet	0.000
Descriptions of existing work activities	Describe work activities currently occurring at nest site and adjacent to the nest site. Be sure to cover all directions (i.e. N/S/E/W).
Environmentally Sensitive Area (ESA) Established?	Yes or No
ESA Type	Two options: ground or helicopter
Work Area Affected?	Yes or No
Name of Road Affected?	Access Road or Named Road
General Notes	Additional information that may be pertinent to the observation. If observed, number of eggs present within the nest. Number of young, more, less, same as previously reported.

3.4 Ongoing Monitoring

Surveyors will be responsible for ongoing monitoring of the nest and for identifying any new nests and potential nests within active construction areas. All subsequent nest visits will be conducted by a single surveyor and will last only as long as necessary to check the nest or until circumstances necessitate departure (e.g., potential nest predator detected or sustained indications of stress by any protected bird). All subsequent nest visits shall be documented in a FRED Bird Nest Event, once established, and noted in the associate Monthly Monitoring Report (for biological resources), as appropriate.

Chapter 4
Glossary

Active nest = A nest is an active nest as soon as construction of a new nest or use of an existing nest commences. In most cases, a previously active nest becomes inactive when it no longer contains viable eggs and/or living young and is not being used by a bird as part of the reproductive cycle (eggs, young, fledging young still dependent upon nest). In some cases, a nest can be abandoned by the bird constructing it and become inactive prior to egg laying. In such cases, determination that the nest is inactive is to be made on a case-by-case basis based on consistent observations and the determination of the Avian Biologist.

Altricial species = Species in which nestlings are blind and helpless at hatching and require parental care for warmth and all food for a period of time. Songbirds and raptors are examples of altricial species.

Clutch = A set of eggs. A clutch is complete when the birds will lay no more eggs for that set of young. In some species, loss of eggs at a certain stage will stimulate production of more eggs while in other species it will not. Clutch size varies both among species and within species.

Confirmed nesting = A nest is confirmed to be active and has eggs or young. This will also include nests that are inferred based on the direct observation of adult behavior (i.e., bringing food items to nestlings). It will also include cavity-nesting species that may be entering or leaving a hole during the nesting season, unless it can be confirmed that an active nest is not present through direct observation of the cavity or behaviors of the adults (and fledglings).

Covered species = Any species protected from take under either the MBTA or similar provisions of the California Fish and Game Code. Currently there are more than 1,000 species protected by the MBTA.

Cowbird = In the Cross Valley Loop Project area, this is primarily the brown-headed cowbird, though at least one other species of cowbird is a rare possibility. Cowbirds are obligate nest parasites. Note that cowbirds are native throughout California and are covered species under the MBTA and similar provisions of the California Fish and Game Code. Cowbird females are somewhat territorial during the nesting season, though they may travel miles daily between a breeding area and foraging area. Male cowbirds are not territorial.

Depredation = Destruction/mortality that may or may not include predation. Examples of depredated nests can include a nest in which the eggs were consumed by a snake or an active nest that was trampled by large wildlife.

Distraction display = Behaviors adult birds use to attract a potential predator away from a nest. Most species with such displays will only use them when they have an active nest; thus, the behavior can be indicative and confirm if a nest is active.

Fledge = To leave the nest. Both altricial and precocial young normally remain at least partly dependent on adults for survival for some time after fledging.

Fledgling = A young bird that has just fledged.

Incubate = To sit upon eggs for the purpose of hatching. Incubation maintains the proper temperature for growth of embryos and provides some protection. Some species incubate starting with the first egg (e.g., raptors) while others provide only limited incubation until the clutch is complete (most birds), ensuring all young hatch around the same time.

Migratory Bird Treaty Act (MBTA) = A federal law that prohibits take of covered species. Nearly all bird species native to the United States are protected under this federal law. There are a number of species (native or nonnative) that belong to the families not referred to in any of the four treaties underlying the MBTA (USFWS 2010) and are added as three groups: (1) nonnative species introduced into the United States or its territories by means of intentional or unintentional human assistance that belong to families or groups covered by the Canadian, Mexican, or Russian Conventions; (2) nonnative human-introduced species that belong to families or groups not covered by the Canadian, Mexican, or Russian Conventions; (3) native species that belong to families or groups represented in the United States, but which are not expressly mentioned by the Canadian, Mexican, or Russian Conventions. An exhaustive list of the species covered by the MBTA has been published (USFWS 2010) and includes nonnative swans, ducks, geese, and pigeons.

Species that are included in Groups 2 and 3 above and excluded from the MBTA include Phasianidae (grouse, ptarmigan, and turkeys), Odontophoridae (New World quail), Psittacidae (parrots), Pycnonotidae (bulbuls), Timaliidae (wrentits), Sturnidae (starlings, except as listed in Japanese treaty), Passeridae (Old World sparrows, including house or English sparrow), and Ploceidae (weavers). Partial lists of the species included in Categories 2 and 3 are available at <http://www.fws.gov/migratorybirds/RegulationsPolicies/mbta/MBTAProtectedNonprotected .html>.

Nest (noun) = In this Plan, a structure formed by birds, most typically as a place in which to lay and incubate eggs and rear young. In some bird species the nest may be nearly absent (e.g., eggs laid directly on rock on a ledge), while in others the nest is quite elaborate. Many bird species also build nests in which no eggs are laid. These may be in addition to the nest with young (e.g., "dummy nests" constructed by wrens) or for roosting by adults (e.g., alternate nests of some raptors and woodpeckers, and nests build year-round by verdins).

Nest (verb) = To attempt to complete a nesting cycle, starting with an active nest through successful independence of young from the nest site. Once the attempt has failed or young are not at substantially increased risk by depredation or removal of a nest, nesting is complete.

Nest abandonment = Abandonment of a nesting effort by birds, resulting in a nest that is no longer active. Typically, that nest site will no longer be visited by those individual birds that season, though those same individuals, other individuals, or even other species may quickly establish a new active nest there, and this can make occupancy difficult to determine.

Nest exchange = When one adult of a pair leaves the nest immediately prior to the other adult taking over nest attendance. Note that this occurs only in some species. In some species males do not attend the nest, but in some of these the male will bring food to the female on the nest.

Nesting season = The portion of the year during which behaviors directly related to nest construction and use occur. This period varies among species as well as within species by major regions and by elevation. This period is often shorter than the nesting season for a given species.

Nestling = A bird that has hatched but is not yet old enough to leave the nest. In precocial species, this period can be very brief.

Nest parasite = Species that do not construct a nest or raise their own young, but lay their eggs in the nest of another species. In the Cross Valley Loop Project area, the only species that regularly do this are cowbirds. Cowbirds will often depredate eggs or young in the nest at the time they lay their egg. See also "Cowbird."

Nest-site dependence = Dependence on the nest site by fledglings. For example, in some bird species adults will only feed fledglings if they return to the vicinity of the nest.

Nonnative bird = A member of a species not naturally occurring in California. Nonnative birds are not covered by the MBTA. Many nonnative species occur in California as escaped cage birds or intentionally released species. Examples of common nonnative species considered to have established populations in southern California include ring-necked pheasant, chukar, rock pigeon, Eurasian collared-dove, spotted dove, red-crowned parrot, Eurasian starling, house sparrow, and nutmeg mannikin.

Pair = One male mated to one female. Note that this only applies to monogamous pairs, which is the most common type of bonding in birds; however, many species have other types of bonding. In addition, in some species the female alone will raise the young (e.g., hummingbirds).

Precocial species = Species in which young are active and able to see and move freely almost immediately after hatching and require moderate to little parental care. Ducks, shorebirds, and quail are examples of precocial species.

Predation = Capturing and consuming prey. Thus, for example, a ground nest trampled by large mammals has been depredated, not predated, but a snake consuming the eggs could also be described as nest depredation. See also, "depredation."

Re-nesting = Attempting to nest again in the same year or season after either a successful or unsuccessful attempt to nest. Some bird species routinely make several attempts, even after successful efforts; some species will only attempt to re-nest after a failed effort, and some will abandon nesting for the season/year if nesting fails. Re-nesting efforts can occur at the same or a new nest site, and occur after a period of no nesting or even begin immediately following the first fledging of young in the prior nest (often with one adult feeding the fledglings and the other primarily attending the new nest).

Take = To pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner any migratory bird. This is extended to any part, nest, or egg of any bird covered by MBTA.

Territory = The area an animal actively defends from activities by other members of its own or other species (typically, except for its own mate). Most birds have some form of territory, but it may be only seasonal, may be just the immediate nest site (e.g., in colonially nesting species), may involve excluding only members of the same sex and species, or may be essentially the entire home range.

Chapter 5
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Attachment A

Species Accounts

SPECIES ACCOUNTS

Breeding Biology and Sensitivity to Disturbance of Species Nesting or Potentially Nesting in San Joaquin Cross-Valley Loop Project Corridor

The information in these species accounts was used to establish the initial minimum-distance buffer zones presented in Table 2-1. These accounts should be referred to when making any determination to modify these minimum-distance buffers as conditions in the field may dictate (see Section 2.1). Species-specific information on nest placement and type should serve as an aid in finding nests, and information on incubation periods and time to fledging can be used to estimate when the nest cycle will be completed and any project-related activity that may have been disrupted by the nest can resume. All avian nest monitors must have this plan in their possession when conducting pre-construction surveys or otherwise searching for or monitoring nests. The species presented in this list are those considered to have the potential to nest in the SJXVL project area. In the event that a species not included in this list is found nesting in the project area, it must be evaluated separately.

Nesting, incubation, and nestling information was obtained primarily from Baichch, P. J., and C. J. O. Harrison, 1997, *A Guide to the Nests, Eggs, and Nestlings of North American Birds*, 2nd edition , published by Academic Press. Breeding season information was obtained from *The Birds of North America* series published by The Birds of North America, Inc. (1992-2002) http://bna.birds.cornell.edu/bna. In instances where information specific to lowland California was not specified, other sources such as Kiff, L, and D. Irwin, 1987, The breeding season of Los Angeles County birds, *Western Tanager* 53 (7):4-5, and Unitt, P., 2004, *San Diego County Bird Atlas*, published by the San Diego Natural History Museum were consulted.

Isolated and extreme nest dates are excluded in the nesting season ranges given in this document. Also not reflected in the species accounts is the fact that a few species breed nearly year-round in the San Joaquin Valley under ideal conditions. Examples include barn owl and mourning dove, and in the foothills, acorn woodpecker. Although active nest searches and monitoring may take place only during the optimal time of year for nesting, all construction monitors should be aware that some species may be nesting at other times. If an active nest is found outside the periods when monitors are actively searching for nests, it should be treated no differently than a nest found during the "typical" breeding season. In these rare instances, the same buffer requirements and nest monitoring protocols should be followed.

QUAIL

Sensitivity to disturbance: Due to ground nesting behavior, quail are probably more sensitive to heavy equipment operating in the vicinity and vibrations produced by those vehicles. Once hatched, precocial young move quickly away from the nest with the adults.

Minimum Buffers:

- 100-ft horizontal buffer for ground construction
- 250-ft horizontal buffer for helicopter construction
- 200-ft vertical buffer for helicopter construction

California Quail (*Callipepla californica*)

Nest: on ground in variety of habitats.
Breeding season: early April through early July; will double brood.
Incubation: 21-23 days; female incubates; male stays nearby.
Nestlings: precocial, very active soon after hatching.
SJXVL breeding distribution: oak savannas scrub north and northeast of Woodlake.

GREBES

Sensitivity to disturbance: Grebes build floating nests held in place in the reeds. Like many duck species, their nests are concealed under a dense vegetation cover and as such are well protected except when heavy equipment is nearby and ground vibrations disturb the adults. Once eggs have hatched and young are on the water neither the young or adults are easily disturbed. Nesting habitat for grebes is extremely limited on or within 0.25 miles of the ROW.

Minimum Buffers:

- 150-ft to 250-ft horizontal buffer for ground construction
- 500-ft horizontal buffer for helicopter construction
- 300-ft vertical buffer for helicopter construction

Pied-billed Grebe (*Podilymbus podiceps*)
Nest: typically, in matted, floating vegetation bordering open water.
Breeding season: March through July; double brood.
Incubation: 23-27 days; only female incubates at first then male participates, then only female during hatching.
Nestlings: precocial; parents may carry them on their backs periodically until independent in 4-11 weeks.
SJXVL breeding distribution: potentially nest along route wherever permanent water with emergent shoreline vegetation is present.

BIRDS OF PREY (CATEGORY 1)

Sensitivity to disturbance: Not easily disturbed unless very direct. As cavity nesters these four species seem to adapt well to the proximity of people unless the direct nest structure (tree, building, cliff, bridge, nest box) is disturbed. All four species are sensitive to heavy equipment operations at < 100 feet.

Minimum Buffers:

- 300-ft horizontal buffer for ground construction
- 300-ft horizontal buffer for helicopter construction
- 200-ft to 300-ft vertical buffer for helicopter construction

American Kestrel (*Falco sparverius*)
Nest: cavity in tree or other structure such as building or tower. Will use nest boxes, 9 to 32 ft high.

Breeding season: mid-March through mid-June; may double brood.
Incubation: 29-30 days; mostly the female incubates; male stays nearby and brings food.
Nestlings: semi-altricial, leave nest at 30 days.
SJXVL breeding distribution: oak savannas north and northeast of Woodlake; possibly also in parks.

Barn Owl (*Tyto alba*)
Nest: cavity in tree, building, crevice in rocks, outcrops, cliffs and quarries; up to 65 ft.
Breeding season: late January through mid-May; often double broods. In California known to predictably nest year round in all months during certain peak rodent productivity years.
Incubation: 32-34 days; only female incubates; male stays nearby and brings food.
Nestlings: altricial, fly at 60 days.
SJXVL breeding distribution: throughout.

Western Screech-Owl (*Megascops kennecottii*)
Nest: in open woodlands in natural cavity or old woodpecker hole, 6 to 30 ft high. Will use nest boxes.
Breeding season: early March through mid-June.
Incubation: 21-30 days; uncertain if both or only female incubates.
Nestlings: altricial, fledge at 28 days.
SJXVL breeding distribution: oak savannas north and northeast of Woodlake.

BIRDS OF PREY (CATEGORY 2)

Sensitivity to disturbance: These species all acclimate to the presence of people, depending upon the type and duration of activity. Cooper's hawks, red-shouldered hawks, and great horned owls nesting in southern California include numerous successful urban pairs as well as the pairs nesting in natural areas. Urban red-tailed hawk pairs tolerate small buffers while natural pairs need greater distances between their nest and human activity. Western screech-owls are cavity nesters and are tolerant of nearby human activity unless their nest tree is disturbed. Burrowing owls tend to be very tolerant unless their foraging habitat is eliminated or their nest burrow and escape burrows are chronically disturbed.

Minimum Buffers:

- 300-ft (urban nesters) to 250-ft horizontal buffer for ground construction
- 300-ft (urban nesters) to 300-ft horizontal buffer for helicopter construction
- 200-ft to 300-ft vertical buffer for helicopter construction

Cooper's Hawk (*Accipiter cooperii*)
Nest: in forests in trees, 20-60 ft high.
Breeding season: early April through mid-June; single brood.
Incubation: 36 days; only female incubates; male stays nearby and brings food.
Nestlings: semi-altricial, fly at 30-34 days.
SJXVL breeding distribution: oak savannas north and northeast of Woodlake and perhaps parks around Visalia.

Red-shouldered Hawk (*Buteo lineatus*)
Nest: in moist woodlands in trees, 20-60 ft high.

Breeding season: early March through early June; single brood.
Incubation: 23-25 days; both sexes (but mostly female) incubate.
Nestlings: semi-altricial, fly at 5-6 weeks.
SJXVL breeding distribution: perhaps in well watered park settings with large trees.

Red-tailed Hawk (*Buteo jamaicensis*)
Nest: wide variety of habitats in tall tree, pole, or transmission tower, 35 to 90 ft high.
Breeding season: late February through early May; single brood.
Incubation: 28-32 days; both sexes incubate.
Nestlings: semi-altricial, fly at 6 weeks.
SJXVL breeding distribution: throughout.

Great Horned Owl (*Bubo virginianus*)
Nest: in woodlands in natural cavity in tree, in fork, on rock ledge or in cave. Ground to 90 ft.
Breeding season: late January through mid-May; single brood.
Incubation: 26-35 days; mostly female incubates.
Nestlings: altricial, leave nest at 4-5 weeks.
SJXVL breeding distribution: throughout.

Burrowing Owl (*Athene cunicularia*)
*Nest*s: in burrows in open grassy places or at edge of agriculture.
Breeding season: early April through late June; single brood.
Incubation: 27-30 days; only female incubates; male stays nearby and brings food.
Nestlings: altricial, fledge at 40-45 days.
SJXVL breeding distribution: possibly in grasslands north and northeast of Woodlake and along embankments of irrigation canals.

BIRDS OF PREY (CATEGORY 3)

Sensitivity to disturbance: Because turkey vultures tend to nest in relatively dark nooks and crannies of cliffs or boulder-strewn hillsides in southern California, they usually respond well as long as they can enter their nest caves to swap incubation duties or feed their young. Adults rarely exit the nest to escape the area unless people are in the immediate 10-foot radius of the entrance; however, if off the nest when people or machinery approach their nest too closely for any length of time, they may abandon the nest. Urban nesting white-tailed kites and red-tailed hawks are often tolerant of human activity, but pairs nesting in more natural areas will predictably need larger buffers than the minimum prescribed here. For example, wild red-tailed hawk pairs are often sensitive to climbers on adjacent towers so, as a rule, major construction or climbing should take place at least two towers away from an active tower nest. Similarly, prairie falcons are generally intolerant of people near their cliff nests and respond by diving on people in the vicinity of their nest if aggravated. Peregrines tend to be tolerant but very defensive around their nests, and rarely fail as a result of construction activity. Spotted owls generally nest in remote natural areas within national forests, but they generally tolerate most light activities undertaken by people. The long-eared owl tends not to nest any closer than one-quarter mile from people. Exceptions exist but as a rule long-eared owls are intolerant of people and should be given conservative buffers whenever possible.

Minimum Buffers:

- 300-ft horizontal buffer for ground construction, depending on the species and setting (urban vs. remote) – see paragraph above
- 500-ft horizontal buffer for helicopter construction, depending on the species and setting (urban vs. remote) – see paragraph above
- 300-ft to 500-ft vertical buffer for helicopter construction
- 660-ft to 1,320-ft buffer for praire falcon

Turkey Vulture (*Cathartes aura*)
Nest: on bare soil, wood, leaf litter, punk, straw, etc., up to 20 ft high in secluded, undisturbed dark sites like caves, rock crevices, or maybe even an abandoned building;.
Breeding season early March through early June; single brood.
Incubation: 37-41 days; both sexes incubate.
Nestlings: semi-altricial, fly at 11 weeks.
SJXVL breeding distribution: Rocky outcrops north and northeast of Woodlake.

Northern Harrier (*Circus cyaneus*)
Nest: on ground, in tall grasslands, meadows, and marshes (salt and fresh).
Breeding season: mid-February through early August; single brood.
Incubation: 29-39 days; only female incubates.
Nestlings: altricial, fly at 37 days.
SJXVL breeding distribution: potentially in grasslands north and northeast of Woodlake.

Red-tailed Hawk (*Buteo jamaicensis*)
See "Birds of Prey (Category 2)"

Long-eared Owl (*Asio otus*)
Nest: in dense coniferous or mixed woodland. Use old nests of other birds high in a tree, 10 to 29 ft.
Breeding season: early February through mid-May; double brooded.
Incubation: 25-30 days; only female incubates.
Nestlings: altricial, fledge at 23-24 days.
SJXVL breeding distribution: wherever dense woodland occurs.

Prairie Falcon (*Falco mexicanus*)
Nest: on ledge under overhang on rock outcrop or cliff; usually 30 to 40 feet up on cliff ledge but can be up to 400 ft high.
Breeding season: late March to early May; single brood.
Incubation: 29-31 days; both sexes incubate; male rarely assists but brings food.
Nestlings: semi-altricial, leave nest at 40 days.
SJXVL breeding distribution: Rocky outcrops north and northeast of Woodlake.

BIRDS OF PREY (CATEGORY 4)

Sensitivity to disturbance: Swainson's hawks, peregrine falcons and white tailed kites are more sensitive to disturbance than the birds in Category 3. Swainson's hawks are also listed as California threatened, warranting extra caution to avoid any reasonable chance of spooking birds at their nest.

Minimum Buffers:

- 1320-ft to 2640-ft horizontal buffer for ground construction
- 1320-ft to 2640-ft horizontal buffer for helicopter construction
- 1320-ft to 5280-ft vertical buffer for helicopter construction

Swainson's Hawk (*Buteo swainsoni*)
Nest: In San Joaquin Valley nests in willows, cottonwoods, oaks, eucalyptus, and several other species of exotic landscape trees 6 to 30 ft high.
Breeding season: early March through mid-August; single brood.
Incubation: 28 days; both sexes incubate.
Nestlings: semi-altricial, fly at 4-5 weeks old.
SJXVL breeding distribution: oak savannas north and northeast of Woodlake.

White-tailed Kite (*Elanus leucurus*)
Nest: in small (elderberry) to tall (valley oak, western sycamore) trees near open country,10-60 ft high.
Breeding season: mid-February through mid-August; sometimes triple brooded.
Incubation: 28-30 days; only female incubates; male stays nearby and brings food.
Nestlings: semi-altricial, fly at 34-40 days old.
SJXVL breeding distribution: oak savannas north and northeast of Woodlake.

Peregrine Falcon (*Falco peregrinus*)
Nest: on a cliff ledge, from 25 to 1,300 ft high; cliffs 165 to 650 ft high preferred.
Breeding season: early March through early June; single brood.
Incubation: 28-29 days; both sexes incubate.
Nestlings: semi-altricial, fly at 35-42 days.
SJXVL breeding distribution: possibly rocky outcrops north and northeast of Woodlake.

BIRDS OF PREY (CATEGORY 5)

Sensitivity to disturbance: Both bald and golden eagles are highly sensitive to human disturbance near their nest, golden eagles generally more so than bald. Both tend to be less sensitive to machinery (e.g., helicopters) than human foot traffic.

Minimum Buffers:

- 2640-ft to 5280-ft horizontal buffer for ground construction
- 2640-ft to 5280-ft horizontal buffer for helicopter construction
- 2640-ft to 5280-ft vertical buffer for helicopter construction

Bald Eagle (*Haliaeetus leucocephalus*)
Nest: large platform structure, typically in Blue Oak, usually but not always near a large reservoir, lake or river in the foothills.
Breeding season: early January through late July; single brood.
Incubation: 35-40 days; both sexes, but primarily the female, incubate.
Nestlings: altricial; may fledge anywhere between 8 and 14 weeks.
SJXVL breeding distribution: Potentially oak savannas north and northeast of Woodlake.

Golden Eagle (*Aquila chrysaetos*)
Nest: rock ledges of outcrops or cliffs, can use trees; up to 100 ft high.
Breeding season: February through May; single brood.
Incubation: 43-45 days; female mostly incubates; male may help.
Nestlings: semi-altricial, leave nest at 63-70 day old.
SJXVL breeding distribution: oak savannas north and northeast of Woodlake.

SHOREBIRDS

Sensitivity to disturbance: Killdeer commonly nest near construction yards, probably attracted by the presence of gravel on the roads and puddles from water trucks. They usually become agitated by approaching humans in cars or on foot when about 100 feet out from their ground nest, typically performing distraction displays. When this happens, one should assume that a nest is in the immediate vicinity, leave the area, and observe from a distance to identify the location of the eggs. Stilts always nest near water and usually out in the open. Most pairs will leave the nest when people are about 150 feet away.

Minimum Buffers:

- 125-ft to 150-ft (killdeer) and 200-ft to 250-ft (all other shorebirds in the category) horizontal buffer for ground construction
- 200-ft to 300-ft horizontal buffer for helicopter construction
- 200-ft to 300-ft vertical buffer for helicopter construction

Killdeer (*Charadrius vociferus*)
Nest: on the ground in open places, usually in areas with short grass, sand or gravel.
Breeding season: early March through late June; sometimes double brooded.
Incubation: 24-26 days; both sexes incubate.
Nestlings: precocial, leave nest soon after hatching.
SJXVL breeding distribution: throughout west of foothills.

PIGEONS

Sensitivity to disturbance: Band tailed pigeons nest in oaks and conifers, and unless the tree is disturbed, usually remain on their nest with people in the immediate vicinity. Pigeons and doves typically build flimsy nests which can be easily blown out by excessive helicopter rotor wash.

Minimum Buffers:

- 100-ft horizontal buffer for ground construction
- 200-ft horizontal buffer for helicopter construction
- 200-ft vertical buffer for helicopter construction

Band-tailed Pigeon (Patagioenas fasciata)
Nest: in tree or shrub 8 to 20 ft up, usually in areas where oak trees occur.
Breeding season: mid-March through mid-November; probably several broods.

Incubation: 18-20 days; both sexes incubate.
Nestlings: altricial, fledge at 25-30 days.
SJXVL breeding distribution: oak savannas north and northeast of Woodlake.

DOVES

Sensitivity to disturbance: Urban nesting mourning doves are tolerant of human disturbance of most any kind, but pairs nesting in natural areas can be much more sensitive to disturbance, especially ground-nesting pairs, when they are subjected to human activity for extended periods or to heavy equipment moving earth.

Minimum Buffers:

- 25-ft (urban nesters) to 75-ft horizontal buffer for ground construction
- 200-ft horizontal buffer for helicopter construction
- 150-ft vertical buffer for helicopter construction

Mourning Dove (Zenaida macroura)
Nest: in wide variety of habitats, typically in tree or shrub from ground to 25 ft up.
Breeding season: late March through early September; several broods.
Incubation: 14-15 days; both sexes incubate.
Nestlings: altricial, fledge at 13-15 days. throughout.
SJXVL breeding distribution: throughout.

ROADRUNNERS

Sensitivity to disturbance: Roadrunners are very intolerant of close or continuous human disturbance involving frequent visits to the nest vicinity, many people in the area, or operation of heavy equipment. Habitat removal and earth moving tend to provide an initial pulse of abundant food followed by a dearth of food. Steps should be taken to assure that the buffer contains adequate prey resources or that the surrounding intact natural landscape is readily and safely accessed.

Minimum Buffers:

- 200-ft horizontal buffer for ground construction
- 200-ft horizontal buffer for helicopter construction
- 200-ft vertical buffer for helicopter construction

Greater Roadrunner (Geococcyx californianus)
Nest: in arid areas, low in tree in shrubby thicket, ground to 15 ft up.
Breeding season: early March through mid-July, single brood.
Incubation: 20 days; both sexes incubate.
Nestlings: altricial, leave nest in 11 to 19 days.
SJXVL breeding distribution: grasslands and scrub-covered hills north and northeast of Woodlake.

CAPRIMULGIDAE

Sensitivity to disturbance: As nocturnal aerial foragers these ground nesters are relatively intolerant of human disturbance, and nests often fail if "bumped" from their nests during diurnal hours and the adults are not allowed to return quickly. A substantial buffer or continuous monitoring of nests from a distance is important to ensure successful nesting.

Minimum Buffers:

- 150-ft horizontal buffer for ground construction
- 200-ft horizontal buffer for helicopter construction
- 150-ft to 200-ft vertical buffer for helicopter construction

Lesser Nighthawk (Chordeiles acutipennis)
Nest: on bare ground in sandy or gravelly sites in dry washes, rocky areas, and scrubland.
Breeding season: late April through late July; single brood.
Incubation: 18 to 19 days; only female incubates.
Nestlings: semi-precocial, can walk towards parents soon after hatching.
SJXVL breeding distribution: possibly in sparsely vegetated areas north and northeast of Woodlake.

Common Poorwill (Phalaenoptilus nuttallii)
Nest: on bare open area of rock, gravel or bare earth, often at the base of a shrub.
Breeding season: late March through early July; often double brooded.
Incubation: 20 to 21 days; both sexes incubate.
Nestlings: semi-precocial, adults may move young around frequently.
SJXVL breeding distribution: scrub-covered hills north and northeast of Woodlake.

SWIFTS

Sensitivity to disturbance: Because of their aerial foraging habits and inaccessible nesting sites on cliffs and concrete highway bridges, white-throated swifts are not vulnerable to human disturbance that does not directly intrude on their nest.

Minimum Buffers:

- 50-ft to 100-ft horizontal buffer for ground construction
- 50-ft to 200-ft horizontal buffer for helicopter construction
- 50-ft to 100-ft vertical buffer for helicopter construction

White-throated Swift (*Aeronautes saxatalis*)
Nest: in rock cracks and crevices on cliffs, 10 to 195 ft up.
Breeding season: early May through early July.
Incubation: 20-27 days.
Nestlings: altricial, fledge at around 25 days - little information known.
SJXVL breeding distribution: most likely under freeway overpasses.

HUMMINGBIRDS

Sensitivity to disturbance: As a group, hummingbirds are generally tolerant of close human activity, even at less than 25 feet; however, flowering plants whose flowers attract hummingbirds should be left intact within 200 yards of the nest, wherever possible.

Minimum Buffers:

- 25-ft to 75-ft horizontal buffer for ground construction
- 200-ft horizontal buffer for helicopter construction
- 75-ft to 150-ft vertical buffer for helicopter construction

Black-chinned Hummingbird (*Archilochus alexandri*)
Nest: in trees and shrubs 4 to 10 ft up.
Breeding season: mid-April through mid-June; two or three broods.
Incubation: 13-16 days; only female incubates.
Nestlings: altricial, fledge at 21 days.
SJXVL breeding distribution: well watered parks.

Anna's Hummingbird (*Calypte anna*)
Nest: in wide variety of sites wherever narrow support for nest is present; 2 to 30 ft up.
Breeding season: mid-December through late June; two or three broods.
Incubation: 16-17 days; only female incubates.
Nestlings: altricial, fledge at 25-26 days.
SJXVL breeding distribution: throughout.

KINGFISHERS

Sensitivity to disturbance: require wide horizontal buffers because they are easily spooked. If humans or construction equipment remain close to the nest for any length of time, birds returning to the nest site may not enter the nest. Rarely nests in this region due to limited habitat.

Minimum Buffers:

- 100-ft horizontal buffer for ground construction
- 300-ft horizontal buffer for helicopter construction
- 150-ft vertical buffer for helicopter construction

Belted Kingfisher (*Megaceryle alcyon*)
Nest: self-constructed burrow in river bank or cliff over water.
Breeding season: early April through early July; generally only one brood a year.
Incubation: 22-24 days; both sexes incubate, but extent of male's contribution is unclear.
Nestlings: altricial; fledge in 27-29 days.
SJXVL breeding distribution: potentially in streamside embankments if any exist along the route.

WOODPECKERS

Sensitivity to disturbance: All woodpeckers are cavity nesters, and as such, are somewhat more secluded and protected than open cup-nesting birds that use stick nests. Unless the nest tree or adjacent trees are physically disturbed, woodpeckers are tolerant of temporary human disturbance. Importantly, the live trees and snags that woodpeckers forage in and that surround the nest tree need to be protected through the nesting season.

Minimum Buffers:

- 25-ft to 75-ft (acorn woodpecker) and 175-ft (all other woodpeckers in this category) horizontal buffer for ground construction
- 100-ft (acorn woodpecker) and 200-ft (all other woodpeckers in this category) horizontal buffer for helicopter construction
- 50-ft (acorn woodpecker) and 150-ft (all other woodpeckers in this category) vertical buffer for helicopter construction

Acorn Woodpecker (*Melanerpes formicivorus*)
Nest: in a hole in a tree in open woodland or partly wooded areas; will nest in poles 5 to 25 ft up.
Breeding season: early April through mid-September; two or three broods.
Incubation: 11-12 days; both sexes incubate.
Nestlings: altricial, fledge at 31 days.
SJXVL breeding distribution: oak savannas north and northeast of Woodlake.

Nuttall's Woodpecker (*Picoides nuttallii*)
Nest: in cavity in tree trunk, typically in dead wood, 2 to 60 ft up.
Breeding season: mid-April through late June; single brood.
Incubation: 14 days; both sexes incubate.
Nestlings: altricial, fledge at 29 days.
SJXVL breeding distribution: oak savannas north and northeast of Woodlake.

Northern Flicker (*Colaptes auratus*)
Nest: on ground or up to 100 ft in tree trunk in open or sparsely wooded area; more often in live wood.
Breeding season: early April through early June; single brood.
Incubation: 11-13 days; both sexes incubate.
Nestlings: altricial, fledge at 25-28 days.
SJXVL breeding distribution: oak savannas north and northeast of Woodlake; possibly also in parks.

PASSERINES (CAVITY AND CREVICE NESTERS)

Sensitivity to disturbance: The largest group of birds, Passerines are extremely variable in terms of nesting preferences and tolerance to human disturbance. Many species have adapted well to human-created habitats while those preferring more natural areas (both individual pairs and species) are generally less tolerant. Due to the protected nature of cavity nests, the species that build them seem more tolerant than most open-cup nesting species. If closely monitored in terms of incubation and feeding bouts, all species in this group tolerate significant reductions in buffer width from the

standard of 300 feet if the habitat, terrain, nesting status, and the distance and form of disturbance are carefully evaluated.

Minimum Buffers:

- 100-ft horizontal buffer for ground construction
- 150-ft horizontal buffer for helicopter construction
- 100-ft vertical buffer for helicopter construction

Say's Phoebe (*Sayornis saya*)
Nest: in open areas on ledge with some type of overhang, or under bridge; from ground to 80 ft up.
Breeding season: late March through late June; double brooded.
Incubation: 12-14 days; only female incubates.
Nestlings: altricial, fledge at 14-18 days.
SJXVL breeding distribution: grasslands north and northeast of Woodlake, fallow agriculture fields.

Ash-throated Flycatcher (*Myiarchus cinerascens*)
Nest: in tree cavity in open deciduous woodland; averaging around 13 ft up, but below 20 ft.
Breeding season: early May through early July; single brood.
Incubation: 15 days; only female incubates.
Nestlings: altricial, fledge at 16-17 days.
SJXVL breeding distribution: oak savannas and scrub north and northeast of Woodlake.

Oak Titmouse (*Baeolophus inornatus*)
Nest: natural cavity in tree trunk or branch, 3 to 11 ft up, in oak woodland.
Breeding season: late March through early June; single brood.
Incubation: 14-16 days; only female incubates.
Nestlings: altricial, fledge at 17 days.
SJXVL breeding distribution: oak savannas north and northeast of Woodlake.

White-breasted Nuthatch (*Sitta carolinensis*)
Nest: in deciduous woodland in cavity in dead wood, from ground to 50 ft up.
Breeding season: late March through late June; single brood.
Incubation: 12-14 days; only female incubates; male feeds female.
Nestlings: altricial, fledge at 14-16 days.
SJXVL breeding distribution: oak savannas north and northeast of Woodlake.

Rock Wren (*Salpinctes obsoletus*)
Nest: in crevice on rocky slopes, rock outcrops, and erosion gullies.
Breeding season: late March through mid-June; two or three broods.
Incubation: 12-14 days; only female incubates.
Nestlings: altricial, fledge at 14-16 days.
SJXVL breeding distribution: Rocky outcrops north and northeast of Woodlake.

Bewick's Wren (*Thryomanes bewickii*)
Nest: in open woodlands and shrubby areas, in a tree cavity or on ground, between rocks, or in brush pile, to 20 ft up.
Breeding season: mid-March through early July; two or three broods.
Incubation: 14 days; only female incubates; male feeds female.
Nestlings: altricial, fledge at 14 days.

SJXVL breeding distribution: scrub-covered hills north and northeast of Woodlake.

House Wren (*Troglodytes aedon*)
Nest: wherever there is shrubby cover and thickets; also on or in buildings, machinery; in cavity or crevice of any type, including nest boxes, 4 to 30 ft up.
Breeding season: early April through mid-July; double brooded.
Incubation: 13-15 days; only female incubates.
Nestlings: altricial, fledge at 12-18 days.
SJXVL breeding distribution: throughout

Western Bluebird (*Sialia mexicana*)
Nest: in woodland clearings in tree cavity, 5 to 40 ft up.
Breeding season: mid-April through late June; double brooded.
Incubation: 13-14 days; only female incubates.
Nestlings: altricial, fledge at 20 days.
SJXVL breeding distribution: oak savannas north and northeast of Woodlake.

PASSERINES (BRIDGE, CULVERT, AND BUILDING NESTERS)

Sensitivity to disturbance: Generally, this group of passerines is more tolerant than the preceding group because of their practice of nesting near people; however, since they often build their nest on or in a human-created structure, access to their nesting area must remain unobstructed.

Minimum Buffers:

- 50-ft to 100-ft horizontal buffer for ground construction, depending on degree of nest exposure and the degree to which the nesting pair is accustomed to nearby human activity
- 150-ft horizontal buffer for helicopter construction
- 100-ft vertical buffer for helicopter construction

Black Phoebe (*Sayornis nigricans*)
Nest: on ledge with some type of overhang or under a bridge, often around development.
Breeding season: mid-March through late June; double brooded.
Incubation: 15-18 days; typically only female incubates.
Nestlings: altricial, fledge at 21 days.
SJXVL breeding distribution: throughout near watercourses and well-watered parks.

Say's Phoebe (*Sayornis saya*)
See “Passerines (Cavity and Crevice Nesters)”.

Northern Rough-winged Swallow (*Stelgidopteryx serripennis*)
Nest: in burrow on steep slope or in crevice or hole in bridge or building; 2 to 50 ft high.
Breeding season: late April through mid-June; single brood.
Incubation: 15-16 days; only female incubates.
Nestlings: altricial, fledge at 18-21 days.
SJXVL breeding distribution: potentially throughout near water.

Cliff Swallow (*Petrochelidon pyrrhonota*)

Nest: near water; placed at a 90° juncture of vertical wall and horizontal overhang, on cliff face, building, or bridge. Breeds in dense colonies.
Breeding season: late April through early June; double brooded.
Incubation: 12-14 days; both sexes incubate.
Nestlings: altricial, fledge at 23 days; may return to nest for 2-3 days after fledging.
SJXVL breeding distribution: throughout wherever suitable nesting habitats occur.

Barn Swallow (*Hirundo rustica*)
Nest: near water in open country; typically 6 to 40 ft up in buildings and bridges. Colonial nester.
Breeding season: mid-April through mid-July; double brooded.
Incubation: 14-16 days; both sexes incubate.
Nestlings: altricial, fledge at 17-24 days.
SJXVL breeding distribution: west of dry foothills near water.

House Wren (*Troglodytes aedon*)
See "Passerines (Cavity and Crevice Nesters)".

House Finch (*Carpodacus mexicanus*)
Nest: in cultivated areas and around development in a variety of sites, 3 to 12 ft up; will use same nest for second brood.
Breeding season: late March through mid-July; two or three broods.
Incubation: 12-14 days; only female incubates; male feeds female.
Nestlings: altricial, fledge at 14-16 days.
SJXVL breeding distribution: throughout.

PASSERINES (GROUND NESTERS, OPEN HABITATS)

Sensitivity to disturbance: These species are especially vulnerable because their nest site, if not the nest itself, is exposed to surrounding activity and subject to easy predation by both ground and aerial predators. In addition, because they are ground nesters and are acutely aware of visual and auditory stimuli in the area surrounding the nest site, they may take flight as a result of vibrations produced by vehicles at significant distances from the nest. If the adult is flushed off its nest on hot days, the few minutes away can result in nest failure due to heat stress (eggs and young) and dehydration (young) from high ambient air and ground temperatures.

Minimum Buffers:

- 150-ft horizontal buffer for ground construction
- 200-ft horizontal buffer for helicopter construction
- 150-ft to 200-ft vertical buffer for helicopter construction

Horned Lark (*Eremophila alpestris*)
Nest: on ground in small depression, usually sheltered by plant tufts.
Breeding season: late March through early June; two or three broods.
Incubation: 10-14 days; only female incubates.
Nestlings: altricial, fledge at 9-12 days.
SJXVL breeding distribution: grasslands north and northeast of Woodlake.

Rock Wren (*Salpinctes obsoletus*)

See “Passerines (Cavity and Crevice Nesters)”.

Lark Sparrow (*Chondestes grammacus*)
Nest: in open grassland, usually in depression on ground lined with grasses, ground to 25 ft up.
Breeding season: early April through early July; double brooded.
Incubation: 11-13 days; only female incubates.
Nestlings: altricial, fledge at 9-10 days.
SJXVL breeding distribution: oak savannas and grasslands north and northeast of Woodlake.

Western Meadowlark (*Sturnella neglecta*)
Nest: in open grasslands; domed nest often has tunnel through matted grass to entrance; may breed in small colonies.
Breeding season: mid-March through mid-June; double brooded.
Incubation: 13-15 days; only female incubates.
Nestlings: altricial, fledge at 10-12 days.
SJXVL breeding distribution: grasslands and oak savannas north and northeast of Woodlake.

PASSERINES (UNDERSTORY AND THICKET NESTERS)

Sensitivity to disturbance: Members of this passerine group nest in fairly secluded wooded areas or very dense, shrubby habitats. As such, they can tolerate human disturbance at fairly close range, but their nests should nevertheless be carefully monitored for signs of disturbance.

Minimum Buffers:

- 50-ft to 100-ft (western scrub jay), 100-ft (bushtit, song sparrow, red-winged blackbird, American goldfinch) and 150-ft (all other passerines in this category) horizontal buffer for ground construction
- 200-ft horizontal buffer for helicopter construction
- 150-ft vertical buffer for helicopter construction

Western Scrub-Jay (*Aphelocoma californica*)
Nest: in woodland and scrub in shrub, tree, bush or vine tangle, usually pretty densely covered, 3 to 10 ft up.
Breeding season: mid-March through late June; single brood.
Incubation: 15-17 days; only female incubates, male feeds female; may have unpaired nest helpers.
Nestlings: altricial, fledge at 18 days.
SJXVL breeding distribution: all segments except 4, 10, and northwestern portion of 5.

Bewick's Wren (*Thryomanes bewickii*)
See “Passerines (Cavity and Crevice Nesters)”.

Wrentit (*Chamaea fasciata*)
Nest: in sage scrub and chaparral, 1 to 4 ft off ground.
Breeding season: late March through mid-July; double brooded.
Incubation: 15-16 days; both sexes incubate.
Nestlings: altricial, fledge at 15-16 days.
SJXVL breeding distribution: scrub-covered hills north and northeast of Woodlake.

California Thrasher (*Toxostoma redivivum*)
Nest: in low tree or shrub in sage scrub and chaparral, 2 to 4 ft off ground.
Breeding season: mid-February through early July; double brooded.
Incubation: 14 days; both sexes incubate.
Nestlings: altricial, fledge at 12-14 days.
SJXVL breeding distribution: scrub-covered hills north and northeast of Woodlake.

Orange-crowned Warbler (*Oreothlypis celata*)
Nest: variety of habitats, on ground or in shrub, to 2 ft up.
Breeding season: late April through early July; single brood.
Incubation: 12-14 days; only female incubates.
Nestlings: altricial, fledge at 12-13 days.
SJXVL breeding distribution: potentially in oak and scrub north and northeast of Woodlake.

Common Yellowthroat (*Geothlypis trichas*)
Nest: in low undergrowth by water in reeds over water, near ground to 3 ft up.
Breeding season: mid-April through early July; double brooded.
Incubation: 12 days; only female incubates.
Nestlings: altricial, fledge at 9-10 days.
SJXVL breeding distribution: dense thickets, primarily along watercourses.

Spotted Towhee (*Pipilo maculatus*)
Nest: in low shrubby growth usually on ground or very low in bush, 1 to 5 ft up.
Breeding season: early April through late July; two or three broods.
Incubation: 12-14 days; only female incubates.
Nestlings: altricial, fledge at 9-11 days.
SJXVL breeding distribution: scrub-covered hills north and northeast of Woodlake.

Rufous-crowned Sparrow (*Aimophila ruficeps*)
Nest: in dry rocky areas with sparse undergrowth, on or near ground at base of grass clump.
Breeding season: early April through late June.
Incubation:11-13 days; only female incubates.
Nestlings: altricial, fledge at 8-9 days.
SJXVL breeding distribution: scrub-covered hills north and northeast of Woodlake.

California Towhee (*Melozone crissalis*)
Nest: in shrub or small tree in brushy areas, 1 to 35 ft up, but usually 4 to 12 ft.
Breeding season: mid-March through mid-July; double brooded.
Incubation: 14 days; only female incubates.
Nestlings: altricial, fledge at 10 days
SJXVL breeding distribution: scrub-covered hills north and northeast of Woodlake.

Sage Sparrow (*Amphispiza belli*)
Nest: in chaparral, sagebrush, and other arid scrubs, low in thick bush, ground to 1½ ft high.
Breeding season: late March through late June; double brooded.
Incubation: 13-16 days.
Nestlings: altricial, fledge at 9-10 days.
SJXVL breeding distribution: potentially scrub-covered hills north and northeast of Woodlake.

Song Sparrow (*Melospiza melodia*)

Nest: variety of habitats in low shrubby growth and thickets from ground to 4 ft up.
Breeding season: early March through late July.
Incubation: 12-14 days; only female incubates.
Nestlings: altricial, fledge at 10 days.
SJXVL breeding distribution: dense brush, generally near water throughout.

Lazuli Bunting (*Passerina amoena*)
Nest: in low, thick scrub and riparian habitats, 1 to 10 ft up.
Breeding season: early May through early July; double brooded.
Incubation: 12 days; only female incubates.
Nestlings: altricial, fledge at 10-15 days.
SJXVL breeding distribution: scrub-covered hills north and northeast of Woodlake.

Red-winged Blackbird (*Agelaius phoeniceus*)
Nest: in vegetation at the edge of water, in reeds or shrubs near ground to 14 ft up; semi-colonial.
Breeding season: late March through late June; double brooded.
Incubation: 10-12 days; only female incubates.
Nestlings: altricial, fledge at 10-11 days.
SJXVL breeding distribution: marshes and mustard fields.

American Goldfinch (*Spinus tristis*)
Nest: in variety of habitats but usually associated with water, 1 to 33 ft up.
Breeding season: mid-April through early August; two or three broods.
Incubation: 12-14 days; only female incubates; male feeds female.
Nestlings: altricial, fledge at 11-17 days.
SJXVL breeding distribution: Potentially in well-watered parks and yards with trees.

PASSERINES (SHRUB AND TREE NESTERS)

Sensitivity to disturbance: These species nest relatively high off the ground, and even though their nest site may be more exposed to nearby construction-related activity, they generally maintain a greater vertical distance from most types of disturbance. Therefore, most can tolerate human disturbance relatively close to their nest sites as measured from the ground.

Minimum Buffers:

- 100-ft (American crow, common raven) and 150-ft (all other passerines in this category) horizontal buffer for ground construction, depending on the height of the nest off the ground
- 200-ft horizontal buffer for helicopter construction
- 150-ft vertical buffer for helicopter construction

Cassin's Kingbird (*Tyrannus vociferans*)
Nest: in trees in open country, 8 to 40 ft, sometimes higher.
Breeding season: late April through late June; double brooded.
Incubation: 12-14 days; only female incubates.
Nestlings: altricial, fledge at 14 days.
SJXVL breeding distribution: parks and suburban neighborhoods with large trees.

Western Kingbird (*Tyrannus verticalis*)

Nest: open country in trees and on poles and transmission towers , 5 to 40 ft up.
Breeding season: late April through early June; double brooded.
Incubation: 12-14 days; both sexes incubate.
Nestlings; altricial, fledge at 13-19 days.
SJXVL breeding distribution: parks and suburban neighborhoods with large trees.

Hutton's Vireo (*Vireo huttoni*)
Nest: in live oaks and other trees along streams and canyons, suspended on twig fork, 5 to 35 ft high.
Breeding season: mid-March through late June; double brooded.
Incubation: 14-16 days; both sexes incubate.
Nestlings: altricial, fledge at 14 days.
SJXVL breeding distribution: oak savannas north and northeast of Woodlake.

Yellow-billed Magpie (*Pica nuttallii*)
Nest: in mature oaks 30-60 ft up.
Breeding season: mid-March through ; generally single brooded
Incubation: 16-18 days; only female incubates.
Nestlings: altricial, fledge at 30 days.
SJXVL breeding distribution: possibly in oak savannas north and northeast of Woodlake.

American Crow (*Corvus brachyrhynchos*)
Nest: in variety of habitats in trees, 10 to 70 ft up.
Breeding season: late March through early June; single or double brooded.
Incubation: 18 days; only female incubates; may have unpaired nest helpers.
Nestlings: altricial, fledge at 35 days.
SJXVL breeding distribution: throughout wherever there are trees.

Common Raven (*Corvus corax*)
Nest: in variety of habitats such as sheltered rock ledges or in the fork of trees, or on utility poles and transmission towers, 45 to 80 ft up.
Breeding season: early March through late May; single brood.
Incubation: 20-21 days; only female incubates; male feeds female.
Nestlings: altricial, fledge at 5-6 weeks.
SJXVL breeding distribution: throughout.

Bushtit (*Psaltriparus minimus*)
Nest: hanging nest in tree or shrub, 4 to 50 ft high.
Breeding season: mid-March through late June; probably double brooded.
Incubation: 12-13 days; both sexes incubate.
Nestlings: altricial, fledge at 14-15 days.
SJXVL breeding distribution: oaks and scrub-covered hills north and northeast of Woodlake.

Blue-gray Gnatcatcher (*Polioptila caerulea*)
Nest: cup in tree or shrub in variety of habitats from sparse scrub to heavy woodland, 3 to 80 ft up.
Breeding season: mid-April through mid-July; double brooded.
Incubation: 15 days; both sexes incubate.
Nestlings: altricial, fledge at 12-13 days.
SJXVL breeding distribution: oak savannas north and northeast of Woodlake.

American Robin (*Turdus migratorius*)

Nest: in open areas in tree or shrub, usually in a fork, or on ledge of building, 3 to 25 ft up.
Breeding season: mid-May through late July; two or three broods.
Incubation: 11-14 days; only female incubates.
Nestlings: altricial, fledge at 14-16 days.
SJXVL breeding distribution: well-watered parks and suburban areas with trees.

Northern Mockingbird (*Mimus polyglottos*)
Nest: in shrub in open woodlands, bushes, and in developed areas, 3 to 50 ft up, typically 3 to 10 ft,
Breeding season: late March through late July; two or three broods.
Incubation: 11-14 days; only female incubates.
Nestlings: altricial, fledge at 12-14 days.
SJXVL breeding distribution: throughout, especially in suburban areas and parks.

Phainopepla (*Phainopepla nitens*)
Nest: in desert scrub (desert) or branch of a tree (coastal slope), 4 to 50 ft up.
Breeding season: early March through late May in the desert and late May through mid-August on coastal slope; double brooded.
Incubation: 14-15 days; both sexes incubate.
Nestlings: altricial, fledge at 18-19 days.
SJXVL breeding distribution: oak savannas north and northeast of Woodlake.

Chipping Sparrow (*Spizella passerina*)
Nest: in tree or shrub in open woodlands, 3 to 60 ft high, usually 3 to 20 ft.
Breeding season: late April through late July; double brooded.
Incubation: 11-14 days; only female incubates; male feeds female.
Nestlings: altricial, fledge at 9-12 days.
SJXVL breeding distribution: oak savannas north and northeast of Woodlake.

Black-headed Grosbeak (*Pheucticus melanocephalus*)
Nest: in higher thickets, in trees along streams or in open woodlands, 6 to 12 ft high.
Breeding season: late April through late July; single brood.
Incubation: 12-13 days; both sexes incubate.
Nestlings: altricial, fledge at 12 days.
SJXVL breeding distribution: oak savannas north and northeast of Woodlake.

Brewer's Blackbird (*Euphagus cyanocephalus*)
Nest: usually near water in trees or shrubs, but also in cultivated and urban areas; 18 to 130 ft high, sometimes to 150 ft.
Breeding season: late March through early July; double brooded.
Incubation: 12-13 days; only female incubates.
Nestlings: altricial, fledge at 13 days.
SJXVL breeding distribution: parks, suburban neighborhoods, and commercial centers.

Great-tailed Grackle (*Quiscalus mexicanus*)
Nest: variety of habitats and substrates including cattails, willows, palms, and shade trees, 5 to 15 ft up; colonial breeder.
Breeding season: mid-April through mid-August; double brooded.
Incubation: 13-14 days; only female incubates; male does not participate in nesting other than to defend against predators.
Nestlings: altricial, fledge at 14 days.

SJXVL breeding distribution: potentially anywhere in suburban areas with trees.

Hooded Oriole (*Icterus cucullatus*)
Nest: in shade trees, palms and shrubs, often near houses, 10 to 45 ft up.
Breeding season: mid-April through early August; two or three broods.
Incubation: 12-14 days; only female incubates.
Nestlings: altricial, fledge at 14 days.
SJXVL breeding distribution: suburban areas and parks with palm trees.

Bullock's Oriole (*Icterus bullockii*)
Nest: in areas with scattered large trees, tree rows, or riparian corridors, 6 to 50 ft up.
Breeding season: late April through early July; single brood.
Incubation: 14 days; only female incubates.
Nestlings: altricial, fledge at 14 days.
SJXVL breeding distribution: parks and suburban neighborhoods with large trees.

House Finch (*Carpodacus mexicanus*)
See "Passerines (Bridge, Culvert, and Building Nesters)".

Lesser Goldfinch (*Spinus psaltria*)
Nest: in open country in trees and shrubs, 2 to 30 ft up.
Breeding season: early April through mid-July; two or three broods.
Incubation: 12 days; only female incubates; male feeds female.
Nestlings: altricial, fledge at 11 days .
SJXVL breeding distribution: throughout.

Lawrence's Goldfinch (*Spinus lawrencei*)
Nest: in scattered trees and open woodlands, 3 to 40 ft high on branch.
Breeding season: early April through late July.
Incubation: 12-13 days; only female incubates; male feeds female.
Nestlings: altricial, fledge at 11 days.
SJXVL breeding distribution: oak savannas north and northeast of Woodlake.

American Goldfinch (*Spinus tristis*)
See "Passerines (Understory and Thicket Nesters)".

PASSERINES (TOWER NESTERS)

Sensitivity to disturbance: Some species such as common raven often nest on utility poles and electrical transmission towers in the open. These species need close evaluation, as some pairs by virtue of their acceptance of existing human activity are well adjusted; whereas, pairs nesting on towers in remote areas are often skittish and prone to nest failure early if frequently flushed off eggs.

Minimum Buffers:

- 50-ft to 100-ft horizontal buffer for ground construction under most circumstances, but up to 150 ft for some ravens
- 200-ft horizontal buffer for helicopter construction

- 100-ft to 300-ft vertical buffer for helicopter construction under most circumstances, but up to 300 ft for some ravens

Western Kingbird (Tyrannus verticalis)
See "Passerines (Shrub and Tree Nesters)".

Common Raven (*Corvus corax*)
See "Passerines (Shrub and Tree Nesters)".

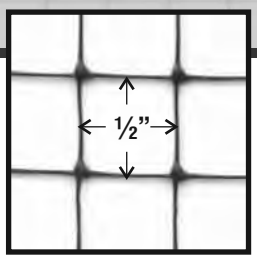
House Finch (*Carpodacus mexicanus*)
See "Passerines (Bridge, Culvert, and Building Nesters)".

Attachment B

Bird Netting Example Specification Sheet

PS

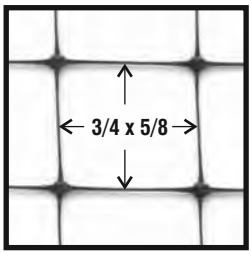
PollyNet™ BIRD NETTING



PollyNet Premium:
Tough, seamless net used for all bird net applications. Small mesh stops birds of all sizes. Economical &UV resistant polypropylene.

Applications:

Windows	Bell Towers
Gazebos	Canopies
Roof Eaves	Dormers
Louvers	Columns
Docks	Bridges
Workshops	Garages
Boat Docks	Fish Ponds
Gardens	Signs
Balconies	I-Beams
Barns/sheds	Storeroom
Crawlspace	Dryer vent



PollyNet Lightweight:
Ultra-light construction. Use for where low visibility & economy are more important than longevity. Low cost.

Applications:

Gardens	Grape Vines
Greenhouses	Nurseries
Berry Crops	Water Tanks
Statues	Landscaping
Hatcheries	Attics
Food Courts	Auditoriums
Duct Work	Piping
Balconies	Potting Sheds
Lattice Work	Seeded Turf

Effective, Durable, Easy To Install and Economical. What More Can You Ask From a Bird Control Netting?

Flexible and easy to cut, PollyNet is an extruded, knotless, UV stabilized, polypropylene bird netting. It is easy to handle, easy to cut, installs quickly and is the most economical bird netting system available. Because the mesh sizes are no larger than 3/4"(1.9cm), PollyNet works for all birds including: sparrows, starlings, pigeons, seagulls, etc. Install PollyNet on, over or around an endless list of objects, openings and structures to protect them from pest birds.

PollyNet has a high strength-to-weight ratio and is dimensionally stable, maintaining its mesh size and shape during installation. Because it is pre-stretched during the extrusion process, a PollyNet installation exhibits minimal stretch or sag. PollyNet is offered in two grades, Premium and Lightweight. Both are made from the same UV resistant black polypropylene material but are used for different applications.

Premium PollyNet - 5 Year UV Warranty

The ½" (1.3cm) square mesh of the Premium PollyNet keeps out all birds including small species. Premium PollyNet comes 14 feet wide and is available in several precut lengths or in bulk rolls. This tough and resilient bird netting is made to withstand the rigors of exterior architectural, agricultural and aquacultural applications.

Premium PollyNet Sizes:
14'x50', 14'x100', 14'x250' and a **14'x3,000' bulk roll**.

Lightweight PollyNet - Disposable Netting

Choose lightweight netting when **low visibility** and **economy are more important than netting longevity**. Lightweight PollyNet has thin strands and large 3/4" x 5/8"(1.9cm x 1.6cm) mesh that makes it very difficult to see when installed. Lightweight comes 17 feet wide and is available in several precut sizes or in bulk rolls.

Lightweight PollyNet Sizes:
17'x50', 17'x100', 17'x250' and a **17'x5,000' bulk roll**.

PollyNet Installation Hardware

Nixalite offers a full line of bird netting installation hardware. For a complete PollyNet installation, we recommend using the **Poly Hardware** to secure the bird netting. Refer to the Nixalite price catalog for details or contact us directly.

Phone: 800.624.1189 or 309.755.8771 Fax: 800.624.1196 or 309.755.0077
Web: www.nixalite.com Email: birdcontrol@nixalite.com

Nixalite® of America Inc.
1025 16th Avenue East Moline, IL. 61244
Experts In Architectural Bird Control Since 1950

PollyNet Bird Netting

Short Form CSI Specifications: CSI Division 10290 - Bird Control

PollyNet™
Available from: ABC/Nixalite
1025 16th Avenue, East Moline, IL 61244,
Phone: 800.624.1189 or 309.755.8771, Fax: 800.624.1196 or 309.755.0077, E-mail: birdcontrol@nixalite.com
Web: www.nixalite.com
CSI Division: 10290/NIX or 10290/ABC

PR-Product Presentation
PollyNet is extruded black polypropylene, knot-free, UV stabilized, bird netting. Available in Premium and Lightweight grades, PollyNet is easy to handle, installs quickly and is the most economical bird netting system available.

PollyNet has a high strength-to-weight ratio and is dimensionally stable, maintaining its size and shape during installation. It will not absorb water and resists the effects from rain, fog, ice and humidity.

PollyNet Installation Hardware
Nixalite offers a complete line of installation hardware for the PollyNet. Easily fasten to wood, masonry, stone, sheet metal, steel, etc.

Premium PollyNet Sizes:
14' x 50' (4.2m x 15.2m), 14' x 100' (4.2m x 30.5m), 14' x 250' (4.2m x 76.2m). Bulk rolls up to 3,000' (914.4m) available.

Lightweight PollyNet Sizes:
17' x 50' (5.1m x 15.2m), 17' x 100' (5.1m x 30.5m), 17' x 250' (5.1m x 76.2m). Bulk rolls up to 5,000' (1,524.0m) available.

UA-Uses, Applications
Install PollyNet to exclude birds from a variety of applications. PollyNet works for all birds, including sparrows, starlings, pigeons, seagulls, etc.

Premium PollyNet:
For architectural, agricultural and aquacultural applications: windows, bell towers, gazebos, canopies, roof eaves, column caps, shipping docks, warehouses, exhaust vents, boat docks, gardens, balconies, HVAC units, etc.

Lightweight PollyNet:
Used for temporary or seasonal bird control applications: gardens, greenhouses, nurseries, berry crops, lattice work, seeded turf, water tanks, etc.

AI-Assembly, Installation
PollyNet is available in many pre-cut sizes. Use the installation hardware and procedures recommended by manufacturer.

MF-Materials, Finishes
PollyNet is made from heavy duty, ultra-violet stabilized polypropylene. Installation hardware is available in polypropylene, stainless steel and galvanized.

TS-Technical Support
Nixalite representatives are available for technical assistance in any aspect of planning, specifying and installation. Free literature and cut sheets available.

PollyNet Thermal Properties:
Melting Point: 320+ degrees F.
Flash Point: 625 degrees F.

PollyNet Chemical Properties:
Polypropylene is inert and resistant to a wide range of chemicals.

SPECIFICATION GUIDELINES

Part 1 - General

1.1 Description
1.1.1 Install PollyNet to exclude pest birds from any open area, structural opening or complicated roost to eliminate the maintenance and repair caused by pest bird droppings and nests.

1.2 Quality Assurance
1.2.1 Obtain and review all planning and technical literature from manufacturer. Contact manufacturer for any planning or installation information that may be pertinent to the installation.

1.2.2 Utilize contractors who are experienced with bird netting and netting installations.

1.3 Submittals
1.3.1 Submit manufacturer's samples, catalog cuts, and other descriptive material.

1.4 Product Handling
1.4.1 Protect PollyNet and hardware systems from damage before, during and after installation.

Part 2 - Products

2.1 Acceptable Manufacturer
2.1.1 ABC/Nixalite of America Inc,
1025 16th Avenue, East Moline, IL 61244
Phone: 800.624.1189 or 309.755.8771,
Fax: 800.624.1196 or 309.755.0077,
E-mail:birdcontrol@nixalite.com,
Web:www.nixalite.com

2.2 Model Designation
2.2.1 **Premium PollyNet**
Construction: Black, UV stabilized, extruded polypropylene.
Mesh size: 1/2" (1.3cm) square.
Netting Sizes: 14' x 10' (4.2m x 3.0m), 14' x 50' (4.2m x 15.2m), 14' x 100' (4.2m x 30.5m), 14' x 250' (4.2m x 76.2m). Bulk rolls up to 3,000' (914.4m) available.

2.2.2 **Lightweight PollyNet**
Construction: Black, UV stabilized, extruded polypropylene.
Mesh size: 3/4" x 5/8" (1.9cm x 1.6cm)
Netting Sizes: 17' x 10' (5.1m x 3.0m), 17' x 50' (5.1m x 15.2m), 17' x 100' (5.1m x 30.5m), 17' x 250' (5.1m x 76.2m). Bulk rolls up to 5,000' (1,524.0m) available.

2.3 Mounting Systems
2.3.1 Use the mounting system recommended by manufacturer.

Part 3 - Execution

3.1 Examination
3.1.1 Examine installation area. Install netting to avoid contact with machinery, vehicles, extreme heat, etc. Remove tree limbs, brush, etc. that could damage the netting. Notify architect of detrimental work conditions. Do not proceed until conditions are corrected.

3.2 Surface Preparation
3.2.1 Surface must be clean and dry at time of installation. Bird droppings shall be removed and disposed of in a safe manner, and in compliance with local and federal regulations.

3.3 Installation
3.3.1 Install PollyNet as recommended by the manufacturer. Installation shall be free of wrinkles, gaps or openings in the netting.

3.4 Inspection
3.4.1 Visually inspect PollyNet installation. Look for conditions that may compromise the effectiveness of the installation.
3.4.2 Repair any detrimental conditions immediately.

OM-Operation, Maintenance
If installed per specifications, PollyNet is virtually maintenance free.

Nixalite® of America Inc.
1025 16th Avenue East Moline, IL. 61244
Experts In Architectural Bird Control Since 1950

***Phone**: 800.624.1189 or 309.755.8771*
***Fax**: 800.624.1196 or 309.755.0077*
***Email:** birdcontrol@nixalite.com*
***Web:** www.nixalite.com*

Attachment C

Bird Spikes Example Specification Sheet

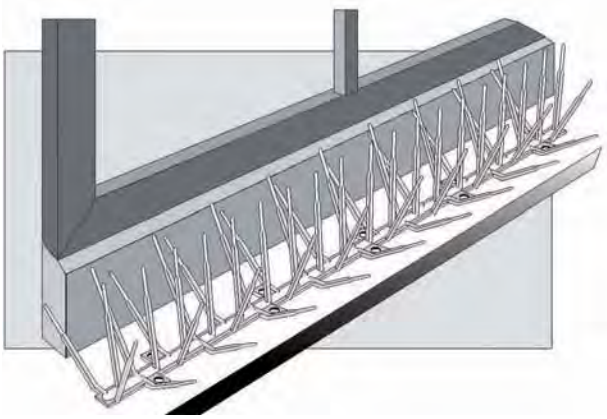
BIRD•B•GONE™ INC. Installation and Applications

BIRD•B•GONE SPIKE Polycarbonate

Description

Patent # US 7243465 US 7596910

Bird-B-Gone Spike Polycarbonate (Formerly Bird Spike 2000) is a physical bird deterrent designed to prevent pest birds from landing. The spike is constructed of durable polycarbonate plastic with U.V. inhibitors. Bird-B-Gone Spikes are easy to install on ledges, I-beams, parapets, sills, pipes, roof peaks, signs and anywhere birds are landing and being a nuisance. It is non-conductive and is the most cost effective, permanent solution for preventing birds from landing.



Widths: 3", 5", & 7"

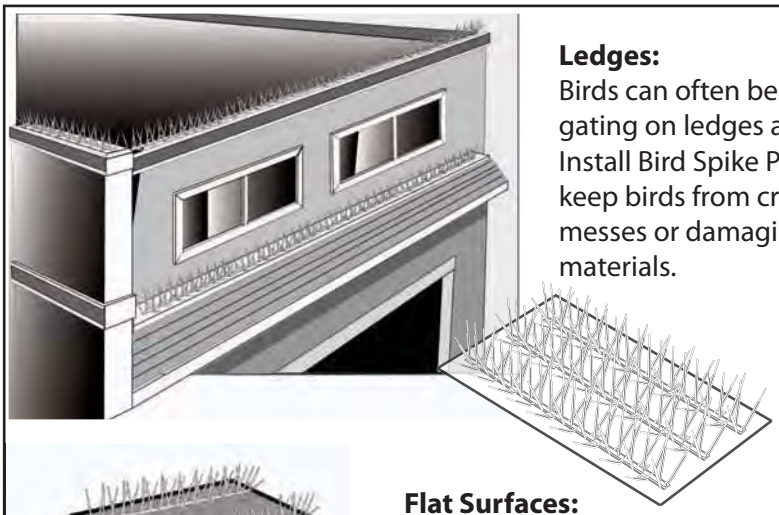
Length: 2' Sections

Colors: Crystal Clear, White, Tan, Brown, Grey, Black, & Brick Red. Custom colors also available.

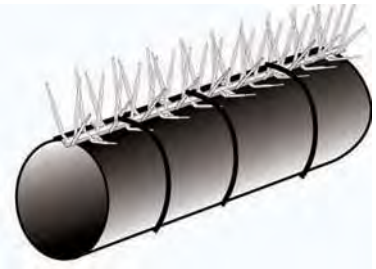
Packaging: Bird-B-Gone Spike Polycarbonate is packaged with 25 two foot sections per box. Each box has 50'

Applications

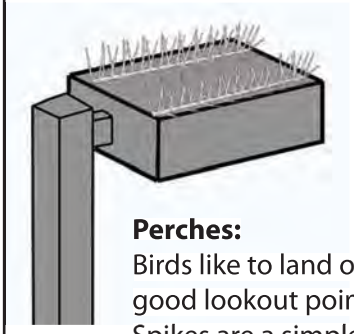
Bird-B-Gone Spike Polycarbonate is a versatile product that can be easily installed onto a variety of surfaces:



Ledges:
Birds can often be found congregating on ledges and rooftops. Install Bird Spike Polycarbonate to keep birds from creating unsightly messes or damaging building materials.



Conduits:
Bird Spikes can be attached to conduits, gutters and pipes using common hose clamps, nylon ties or wire lashings.



Flat Surfaces:
Bird Spike can be installed in multiple rows for wider areas.

Perches:
Birds like to land on high surfaces as it provides a good lookout point for food and predators. Bird Spikes are a simple way to eliminate these landing spots.

Curved Surfaces:
Bird Spike Polycarbonate is flexible and can be installed by using common hose clamps, nylon ties, or wire lashings.

IMPORTANT! Observe all cautions and warnings listed in instructions prior to installation.

BIRD·B·GONE™ INC.

Installation Instructions Polycarbonate Bird Spikes

Caution! READ AND FOLLOW ALL INSTRUCTIONS PRIOR TO ATTEMPTING TO INSTALL BIRD-B-GONE SPIKE - POLYCARBONATE. SPIKES ARE SHARP...BE SURE TO WEAR GLOVES AND SAFETY EYE WEAR. KEEP OUT OF REACH OF CHILDREN AND PETS. DO NOT INSTALL WHERE HUMAN PHYSICAL CONTACT IS POSSIBLE.

1. Thoroughly clean all surfaces before installing Bird Spikes.

Suggestion: Use a 10% bleach or ammonia solution to disinfect the area. It is important that all debris is removed including overhanging branches, leaves, and nesting materials before disinfecting the area.

DUE TO INFECTIOUS DISEASES ASSOCIATED WITH BIRD FECES, BE SURE TO USE EXTREME CARE WHEN REMOVING NESTS AND DROPPINGS.

2. Determine method for attaching Bird Spike.

***For Wood:** Use wood screws to secure Bird Spikes into a wood surface. There are two sets of holes between each "fan" of spikes. Make sure the ends are secured tightly and at least one screw is placed every six inches.

***For Concrete:** Outdoor construction adhesive can be used to secure Bird Spikes down to a variety of surfaces. Bird-B-Gone Spike - Polycarbonate has a glue trough along the base. Bird-B-Gone sells a polyurethane adhesive meant for outdoor use. Each tube will cover approx. 25 feet of spike. Silicone adhesives are not recommended. For extra security, screw or bolt down the spikes along with using an adhesive.

3. When using Adhesives:

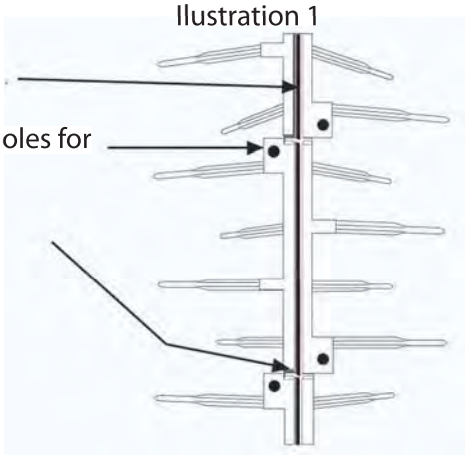
- Run a bead line of adhesive down the underside of the spike. (Illus #1) Also put a dollop of adhesive on each screw hole, allowing the adhesive to mushroom up for more effective adhesion.

-Carefully place strip onto the surface. Ensure that no more than 1 inch of open space is left around the edges or by the back wall.

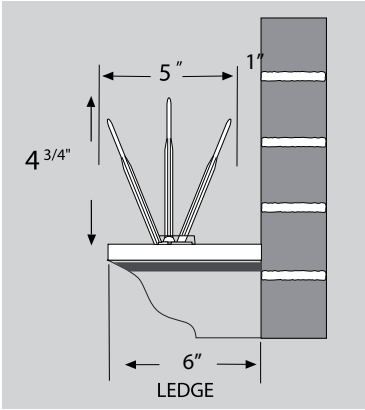
4. Adapting to Size:

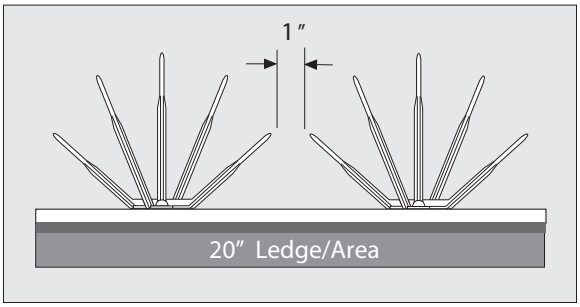
Bird-B-Gone Spike Polycarbonate comes in 2 foot sections, but can easily be cut down into smaller lengths if needed using tin snips, wire cutters, a hacksaw etc.

Ilustration 1



All spikes are 4-3/4" tall





If you have any questions regarding Bird Spike Installation call us at 1-800-392-6915 / 949-472-3122

Bird-B-Gone, Inc. 1-800-392-6915
www.birdbgone.com / email: nobirds@birdbgone.com Fax: 949-472-3116

Patent # US 7243465 US 7596910

Attachment D

Repeller Ribbon Example Specification Sheet

Tangle Guard Repeller Ribbon

A holographic foil ribbon that provides economical and humane spot control for nuisance birds and animals.

Repeller Ribbon is a safe, non-toxic and humane method for discouraging nuisance birds from roosting in gardens, home orchards, berry patches, trees, and structures.

Made in 25 and 100 foot long rolls, the Repeller Ribbon is a holographic Mylar foil that provides temporary spot control for nuisance birds by producing visual and audible discomfort zones. A light breeze can produce bright reflections, sudden movement and a metallic rattle which encourages pest birds and nuisance animals to away.

For simple spot control, installation is easy. With scissors, cut several pieces of Repeller Ribbon 2 to 3 foot long. Position these pieces of ribbon where nuisance birds and animals will see its flash and hear its metallic rattle. Fasten each piece at one end using velcro, string, twine, staples, etc. Make sure the Repeller Ribbon can move freely.

Use with Nixalite's Deer Blocker Deer Fence as Avoidance Flagging ! This is required for the first few months of the installation to ensure an effective deer barrier. Cut the ribbon into 16" to 24" lengths. Position each ribbon 4 feet up from the ground, every 10 feet of fence.

Use with simple garden poles to create a quick barrier fence to keep geese and other waterfowl from walking out of the water and into your yard. Run two rows of ribbon tied to simple posts or poles along the water's edge.

For more uses and applications, contact Nixalite.

Spot Control:

- Gardens
- Small Orchards
- Hobby Vineyards
- Trees, Shrubs
- Parking Areas
- Garage, Storage
- Boat Slips
- Gazebos, Sheds
- Small Ponds
- Barns, Stables
- Many More!

Use with other Nixalite products:

- Bird Scare Predator Eyes
- Scarecrow Motion Activated Sprinkler
- Deer Blocker Deer Fencing Systems
- Simple Barrier Fencing for Geese

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Fax: *800.624.1196 or 309.755.0077*
Email: *birdcontrol@nixalite.com*
Web: *www.nixalite.com*

Where the World Shops for Humane Bird and Animal Control.

Attachment E

Nest Platform

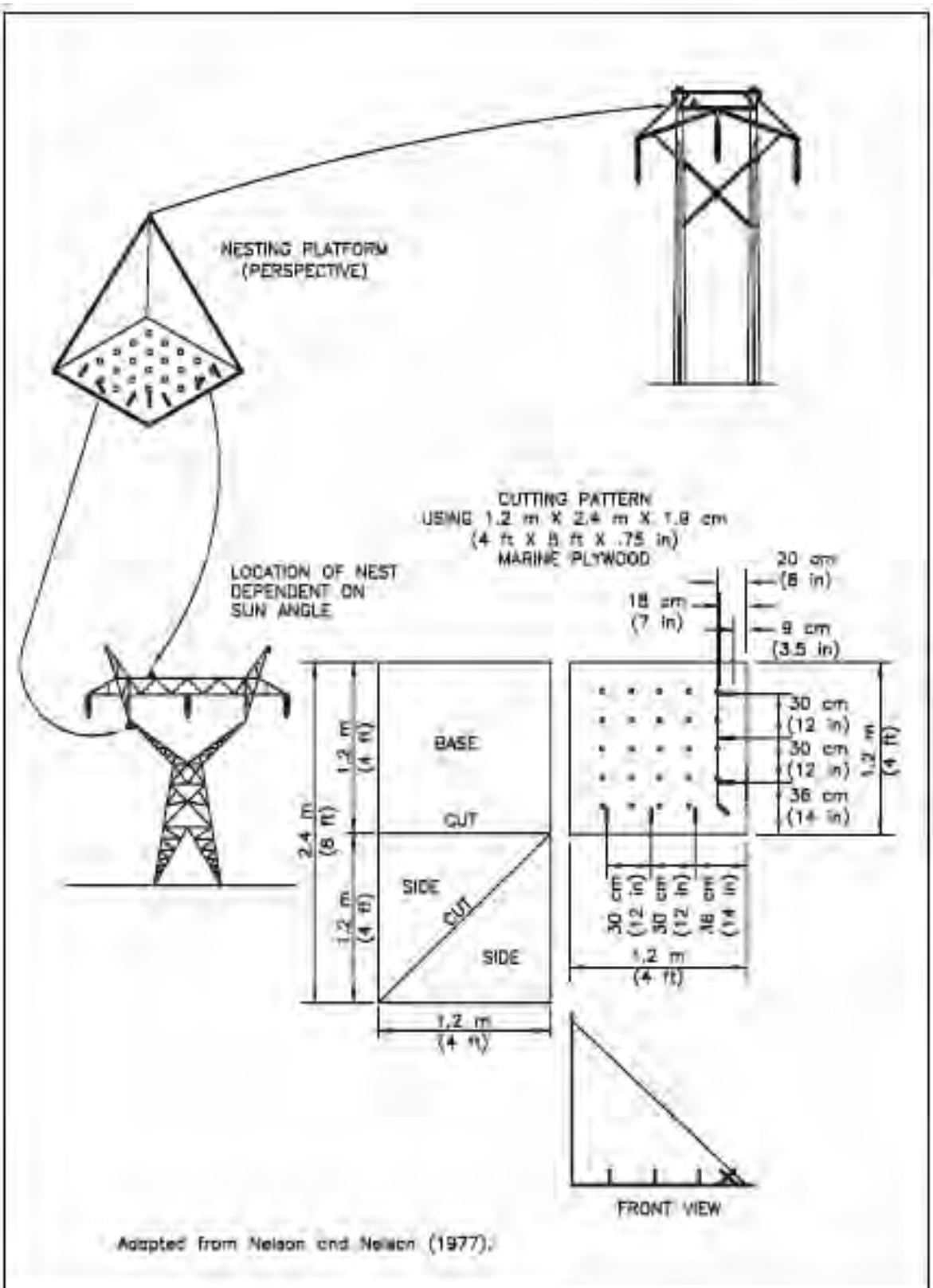
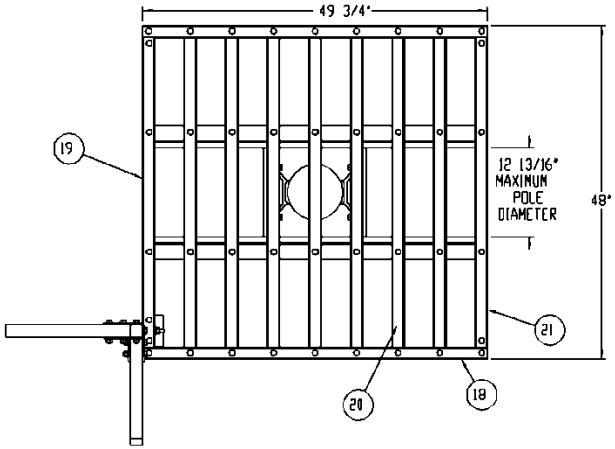
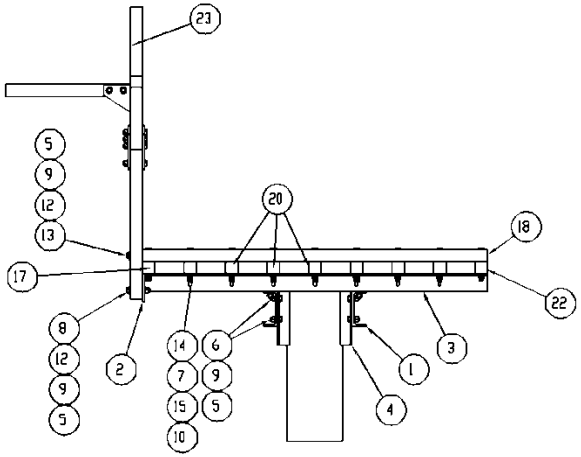
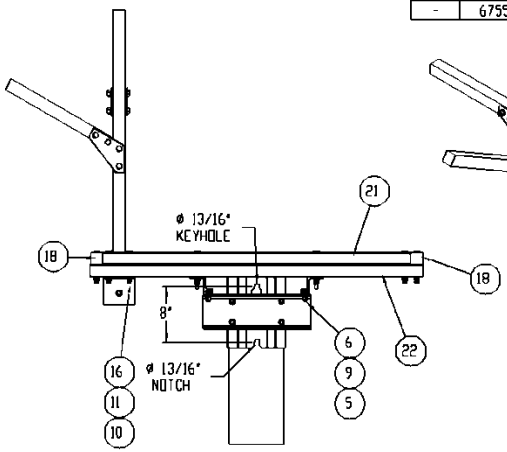


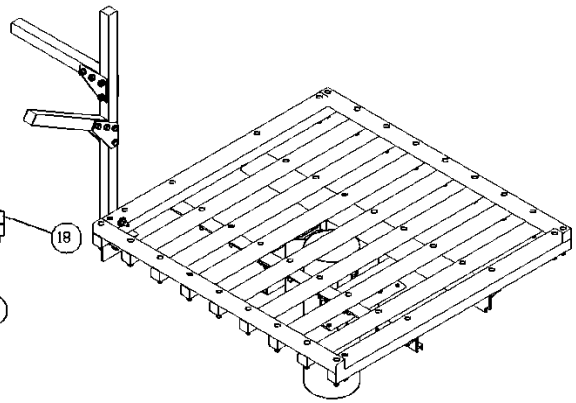
FIGURE 6.4: The Morley Nelson raptor nest platform.



ITEM	PART NUMBER	QTY.	DESCRIPTION	Length
1	00926	2	CHANNEL, 5" X 2"	15 1/2"
2	03418	1	ANGLE, 3" X 4" X 1/4"	4 1/2"
3	14278	2	ZT SECTION	49 3/4"
4	14279	2	POLE GAIN	10 1/4"
5	30009	14	NUT, HEX, 1/2" (.018 OS)	
6	30019	12	BOLT, HEX, 1/2" X 1-1/4"	1 1/4
7	30025	35	3/8" TYPE "A" WIDE FLATWASHER	
8	30030	1	BOLT, HEX, 1/2" X 3"	3
9	30039	14	1/2" REGULAR HELICAL LOCKWASHER	
10	30045	41	NUT, HEX, 3/8" (.017 OS)	
11	30049	2	3/8" REGULAR HELICAL LOCKWASHER	
12	30051	3	1/2" TYPE "A" WIDE FLATWASHER	
13	30105	1	BOLT, HEX, 1/2" X 5" (3" MIN THREAD)	5
14	30126	14	BOLT, CAR HEAD, 3/8" X 3-1/2"	3 1/2
15	30285	39	3/8" DOUBLE COIL LOCKWASHER	
16	30335	27	BOLT, CAR HEAD, 3/8" X 4-1/2"	4 1/2
17	40177	1	APITONG BRACE	48"
18	40178	2	APITONG BRACE	49 3/4"
19	40179	1	APITONG BRACE	44 1/2"
20	40180	7	APITONG BRACE	48"
21	40181	1	APITONG BRACE	44 1/2"
22	40182	1	APITONG BRACE	48"
23	51276	1	RPD-DRY1	
-	67554	1	ID LABEL	







CHANGE / REVISION DESCRIPTION	C.N. NO.	CHANGE DATE
-	-	-

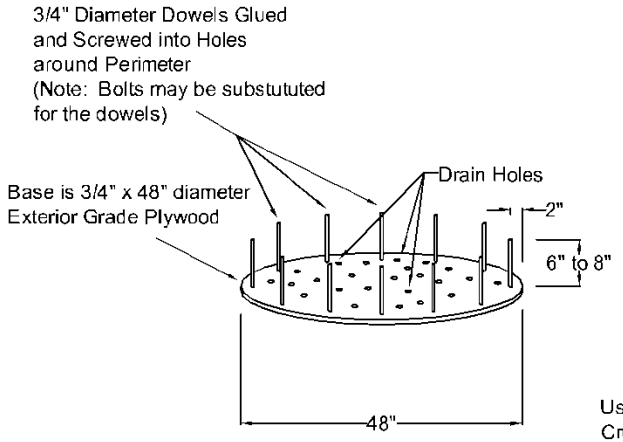
REVISION LEVEL -

51405 PART NUMBER

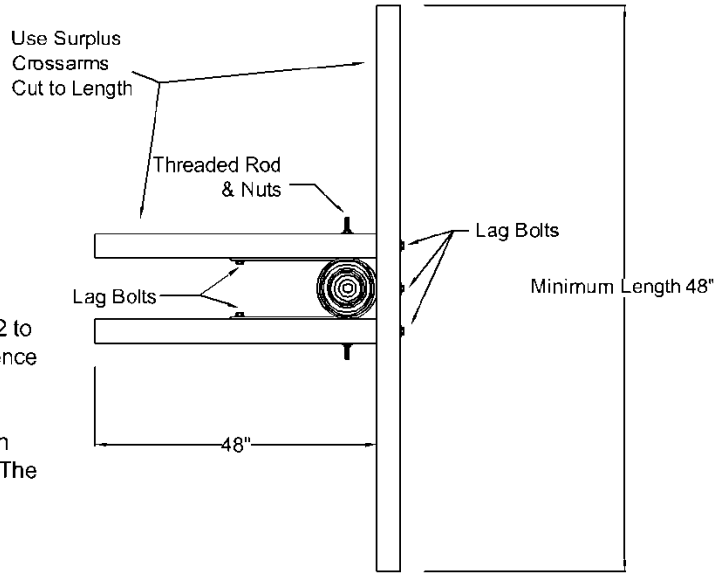
ALUMA-FORM, Inc.
3625 OLD GETWELL ROAD,
MEMPHIS, TN 38118-6072 U.S.A.
TEL (901) 362-0101

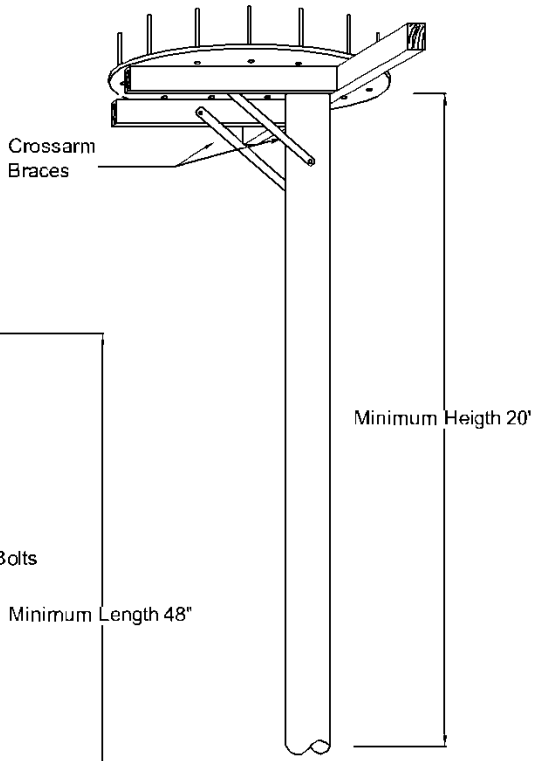
SCALE	1:15	DESCRIPTION	RPD-FCX
PROJECT CODE	FCX	MATERIAL	-
WEIGHT	111.89#	SECTION #	-
REVIEWED	APPROVED	DRAWN BY	CARLISLE
		RELEASE DATE	14-AUG-08
		RELEASE C.N.	3828
		PART NUMBER	51405
		REVISION	-

UNLESS OTHERWISE SPECIFIED, STANDARD ALUMA-FORM, INC. MANUFACTURING TOLERANCES APPLY



PLATFORM





POLE STRUCTURE

NOTES:

1. Sticks approximately 1/2" or less in diameter and 2 to 3 ft. in length are woven around dowels to create a fence to secure additional nest material.

2. Nests may be constructed on the platform while on the ground. Wire the nest materials to the platform. The larger and bulkier the nest is, the more likely it will be used.

3. Material for pole structure, Braces, Crossarms, Lag Bolts, Nuts, Washers, and Threaded Rod are all Surplus.

4. Affix platform to pole structure crossarms with lag bolts. Use Large washers to reduce wear on platform

EDM

OSPREY NEST PLATFORM

Construction Drawing

SCALE: NOT TO SCALE

SHEET: 1 OF 1

Attachment F

Burrowing Owl Management Plan

SOUTHERN CALIFORNIA EDISON
SAN JOAQUIN CROSS VALLEY LOOP PROJECT

BURROWING OWL MANAGEMENT PLAN

PREPARED BY:

Southern California Edison
1218 S. 5th Avenue
Monrovia, CA 91016
Contact: Joanna "Asia" B. Gregory
626-462-2591

March 2013

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1.1.1 Project Description 1
1.1.2 Burrowing Owl Survey History 1
1.1.3 Burrowing Owl Mitigation Measure 3
1.2 Species Biology 3
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2.2 Impact Avoidance 2
2.3 Impact Reduction 2
2.3.1 Training 2
2.3.2 Monitoring 2
2.3.3 Shielding 3
2.3.4 Perches 3
2.3.5 Construction Restrictions 3
2.4 Passive Relocation Process 4
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Chapter 1
Introduction

This Burrowing Owl Management Plan (Plan) provides avoidance and minimization measures that will be applied across Southern California Edison's (SCE) San Joaquin Cross Valley Loop Transmission Project (Cross Valley Loop) to reduce potential indirect and direct impacts to western burrowing owl (owl or burrowing owl, *Athene cunicularia*) individuals and occupied burrows. This Plan has been created to ensure compliance with the San Joaquin Cross Valley Loop Transmission Project Final Environmental Impact Report (FEIR) (CPUC 2010) by implementing the requirements of Mitigation Measure (MM) 4.4-5 for the protection of burrowing owls.

1.1 Project Background

1.1.1 Project Description

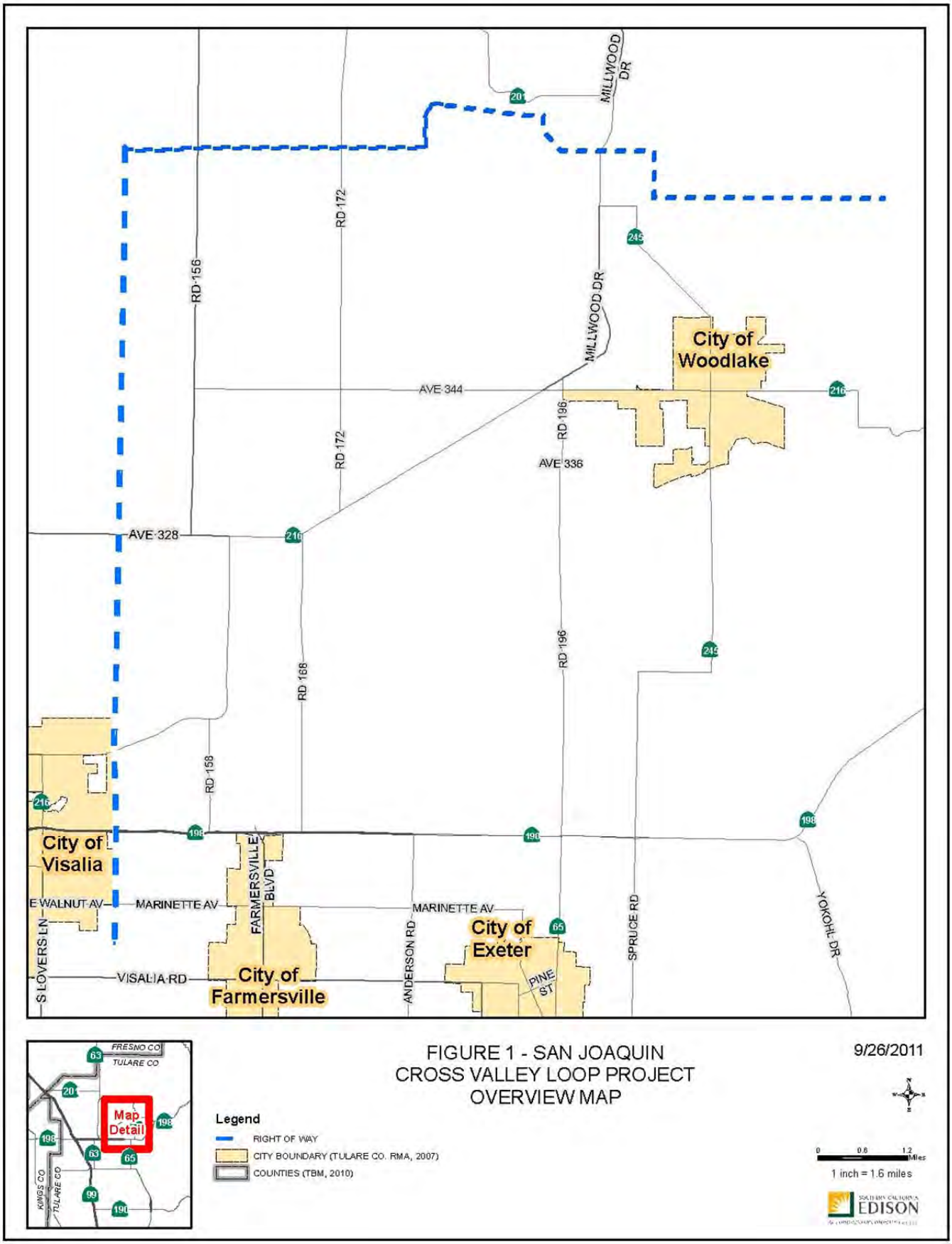
The Cross Valley Loop Project is located within and east of the City of Visalia in Tulare County, California. The Cross Valley Loop Project entails the construction of a new, double-circuit, 220-kilovolt (kV) transmission line intended to maintain safe and reliable electric service to customers and to serve forecasted electrical demand in the southwestern portion of the San Joaquin Valley. The Cross Valley Loop corridor begins at SCE's Rector Substation, located in eastern Visalia, and continues north along existing SCE right-of-way (ROW) for approximately 11.1 miles. From there, it continues 12.2 miles east, then north, and eventually winds along the base of Lone Oak Mountain to loop into the existing Big Creek 3–Springville 220 kV transmission line (Figure 1-1). The existing north-south SCE ROW will remain a width of 150 feet and the new east-west ROW is proposed to be 100 feet wide

1.1.2 Burrowing Owl Survey History

Habitat Assessments and focused burrowing owl surveys have been completed as part of the Cross Valley Loop project including:

- 2011 Raptor Surveys for Southern California Edison San Joaquin Cross Valley Loop Transmission Project, Tulare County, California (Quad Knopf 2011).

A discussion of the burrowing owl survey results and current existing conditions regarding burrowing owl observations and occurrences, as well as presence of suitable habitat in the Cross Valley Loop transmission line corridor is found in Chapter 3 of this Plan.


MILLWOOD DR
RD 172
RD 156
MILLWOOD DR
City of Woodlake
AVE 344
RD 196
RD 172
AVE 336
AVE 328
RD 168
RD 196
RD 158
City of Visalia
E WALNUT AV
MARINETTE AV
FARMERSVILLE BLVD
MARINETTE AV
City of Exeter
S LOVERS LN
VISALIA RD
City of Farmersville
ANDERSON RD
PINE ST
SPRUCE RD
YOKOHL DR
FRESNO CO
TULARE CO
KINGS CO
TULARE CO
Map Detail
Legend
RIGHT OF WAY
CITY BOUNDARY (TULARE CO. RMA, 2007)
COUNTIES (TBM, 2010)
FIGURE 1 - SAN JOAQUIN
CROSS VALLEY LOOP PROJECT
OVERVIEW MAP
9/26/2011
0 0.6 1.2 Miles
1 inch = 1.6 miles
SOUTHERN CALIFORNIA EDISON

1.1.3 Burrowing Owl Mitigation Measure

The following is the specific mitigation measure (Mitigation Measure 4.4-5) described in the Cross Valley Loop Transmission Project FEIR:

Mitigation Measure 4.4-5: SCE and/or its contractors shall conduct preconstruction surveys and implement measures to avoid impacts to burrowing owls.

- A qualified biologist shall conduct preconstruction surveys for burrowing owls 14 to 30 days prior to the start of each new construction phase, using the most current CDFG protocol. Surveys shall cover grassland areas within a 500-foot buffer from all project construction sites within suitable grasslands habitat, checking for adult and juvenile burrowing owls and owl nests. If owls are detected during surveys, occupied burrows shall not be disturbed.
- Construction exclusion areas (e.g., orange exclusion fence or signage) shall be established around occupied burrows, where no disturbance shall be allowed. During the nonbreeding season (September 1 through January 31), the exclusion zone shall extend 160 feet around occupied burrows. During the breeding season (February 1 through August 31), exclusion areas shall extend 250 feet around occupied burrows.
- If the above requirements cannot be met, passive relocation of onsite owls may be implemented as an alternative, but only during the nonbreeding season and only with prior CDFG approval. Passive relocation shall be accomplished by installing one-way doors on the entrances of burrows located within 160 feet of the project area. The one-way doors shall be left in place for 48 hours to ensure the owls have left the burrow. The burrows shall then be excavated with a qualified biologist present. Construction shall not proceed until the project area is deemed free of owls.

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1.2 Species Biology

This distinctive, small owl is a California state species of special concern. Burrowing owls are also protected from direct take (in this case, killing, injuring, or causing failure of an active nesting effort) by both the federal Migratory Bird Treaty Act and the CDFG Code (Section 3503.5 and other sections). This owl is generally most active near dawn and dusk (Zarn 1974). In the survey protocols and the FEIR, the breeding season is defined as February 1 through August 31 (CDFG 1995, California Burrowing Owl Consortium [CBOC] 1993). Fledglings appear to reach independence in August and September (Martin 1973), although this may be a more gradual process in non-migratory populations. In non-migratory burrowing owls, pair bonds often continue year-round; pairs produce only a single brood per year, but they will re-nest in response to early nest failures (Haug et al. 1993). Burrowing owls in the western United States are only rarely known to construct their own burrows (Haug et al. 1993). Many researchers and observers have noted a strong association between burrowing owls and burrowing mammals, especially ground squirrels (*Spermophilus* spp.). Burrowing owls utilize underground burrows for shelter and nesting. Soils suitable for burrows may limit distribution in natural areas; however, the species will also occupy man-made niches such as banks and ditches, piles of broken concrete, and even abandoned structures (Haug et al. 1993).

Grinnell and Miller (1944) describe suitable burrowing owl habitat in California as "open, dry, nearly or quite level, grassland; prairie; desert floor." The CBOC protocol (1993) notes that shrubland should be considered potential habitat if the shrub cover is below 30 percent (CBOC 1993). In coastal Southern California, a substantial fraction of burrowing owls are found in microhabitats highly altered by humans, including flood control and irrigation basins, dikes, banks, abandoned fields surrounded by agriculture, and road cuts and margins. Several factors in combination probably explain the species' distribution on local scales: vegetation density, availability of suitable prey, availability of burrows or suitable soil, and disturbance (primarily from humans). In a few areas, the threat of predators may be an important limiting factor. Threats include deaths caused directly by humans (including vehicle collisions), excessive disturbance by humans and pets, pesticide use (resulting in death, loss of prey populations, and loss of burrow-constructing animals), habitat degradation and loss, and predatory behavior by nonnative animals, especially pets. Burrowing owls are greatly reduced in numbers in coastal southern California as compared to historical populations (Garrett and Dunn 1981; Unitt 2004), with the species now nearly extirpated from many areas (Hamilton and Willick 1996).

Chapter 2
Approach

The Cross Valley Loop Project will implement a phased approach to avoiding and reducing potential impacts to burrowing owl. The first step will be to reduce or move the potential disturbance footprint when occupied burrowing owl burrows and active nests are detected in the vicinity (i.e., within 250 feet during the breeding season or within 160 feet outside of the breeding season, as per the Nesting Bird Management Plan). Some of the Cross Valley Loop work activities have some flexibility for their location and the timeframes of which construction activities can be scheduled, to the greatest extent feasible, to avoid direct and indirect impacts to burrowing owls. If work activities and disturbance footprints do occur within 250 feet of an active nesting burrowing owl burrow or adjacent to known occupied burrowing owl burrows outside the breeding season, a series of indirect impact reduction measures will be implemented, which would include construction monitoring by a qualified burrowing owl biologist. Only when direct and indirect impacts are unavoidable and avoidance is infeasible, will passive relocation (artificial burrow creation, and/or offsite existing burrow enhancement, and burrow collapse) be utilized as a method for avoiding potential direct or indirect mortality. For the management approaches described below, approved burrowing owl biologists that have experience in surveying, monitoring, and relocation of the species will be consulted and utilized.

2.1 Preconstruction Surveys and Clearance Sweeps

Prior to construction of any component of, or associated with, the Cross Valley Loop Project where suitable habitat have been identified, a focused preconstruction survey will be conducted to determine the presence and location of any burrowing owls by a qualified biologist. Per the FEIR, within 30 days prior to construction, a preconstruction burrowing owl survey will be performed by the qualified biologist within the disturbance limits, including access roads, and a 500-foot buffer (survey area) that have potentially suitable burrows; the survey will follow protocol approved by the CDFG and established by the California Burrowing Owl Consortium (CBOC) (1993). Pedestrian transects will be spaced to allow for 100 percent visual coverage of the ground surface, as accessible. Areas that are not accessible will be surveyed using binoculars and/or spotting scopes. Survey visits will be performed during the periods of: (1) from one hour before to two hours after sunrise; or (2) from two hours before to one hour after sunset. Survey visits will not be performed during heavy precipitation, high winds (>20 mph), or dense fog. All burrows and occupied burrows will be mapped using Global Positioning System (GPS) technology. Each burrow will be determined to be occupied or not occupied based upon the field evidence including the presence of owls and/or owl sign including, their droppings, pellets, tracks, feathers, or other debris often deposited at the burrow entrances by the owls.

Biological clearance sweeps will be completed within three business days of the start of construction. During construction and prior to work each day, daily morning biological clearance sweeps will be conducted.

2.2 Impact Avoidance

SCE will work closely with the contractor to reduce or adjust the disturbance areas (for example, an access road, wire stringing site, etc.) in order to avoid direct and indirect impacts to occupied burrowing owl burrows as identified during the preconstruction surveys, clearance sweeps, or during the protocol, focused burrowing owl surveys. The primary goal would be to avoid take of active nesting burrowing owl burrows through the implementation of a 250 foot environmentally sensitive area buffer. Additionally, to avoid take of burrowing owl individuals, occupied burrows identified outside the nesting season will be avoided through the implementation of a 160 foot environmentally sensitive area buffer.

2.3 Impact Reduction

If construction disturbance is to occur during the nesting season within 250 feet of occupied and/or active nest burrows or adjacent to the disturbance limits during the non-breeding season, the following measures will be implemented, as applicable, by the qualified biologist to reduce potential indirect impacts to occupied burrowing owl burrows. If an active nesting burrow is identified, a standard 250 foot environmentally sensitive area buffer will be implemented. If avoidance of a 250 foot buffer is not feasible during the nesting season, a reduced buffer will be recommended and requested from the CDFG and notification sent to the CPUC. Recommendations of reduced buffers will be determined by construction type, activity, and duration; natural history; individual behavior; stage of the reproductive cycle; known tolerances; and site conditions at each specific active nesting burrow. As described below, worker training, monitoring, shielding, perch installation, and construction restriction measures apply to the entire Cross Valley Loop Project and would benefit burrowing owl where they occur by reducing the potential for impacts to the species.

2.3.1 Training

Per the Cross Valley Loop FEIR, SCE or its contractor is required to provide a Worker Environmental Awareness Program (WEAP) training of special-status and sensitive biological resources, including burrowing owl, to the construction crews and all monitors involved with the Cross Valley Loop Project. The WEAP training will be used to educate personnel on identification of the species; their locations within the Cross Valley Loop Project areas; the mitigation measure requirements; the mitigation, minimization, and avoidance measures to reduce potential direct and indirect impacts; and consequences of violations of the mitigation measures.

2.3.2 Monitoring

Per the Cross Valley Loop FEIR, qualified biologists will be on-site during construction to ensure work is being conducted according to the FEIR MMs. Any burrowing owls occurring in close proximity to the construction activity will be closely monitored, and any observed behavioral impacts would be immediately managed by implementing further measures discussed in this section, as determined appropriate by the biological monitor and SCE. Monitoring will provide regular updates on locations and status of all known burrowing owls detected during preconstruction and focused survey efforts, implementation of mitigation measures, and any new suitable burrows located within the work area and buffer.

2.3.3 Shielding

If disturbance must occur inside the 250-foot buffer during the breeding season and if found to be required by the qualified biologist for any occupied burrows during the non-breeding season, shielding the construction activity from the line-of-sight of the occupied burrowing owl burrow and/or active nest will be considered. There are several options that can be selected dependent on site-specific conditions. One option would be to utilize portable chain-link fencing (five-foot height) with shade cloth, constructed so that wind may pass through. Another option may include erecting hay bales. Prior to the implementation of shielding methods, a plan will be submitted to the CDFG for concurrence.

2.3.4 Perches

Appropriate perches may be erected surrounding the burrow so that it could provide safe locations for the burrowing owl to utilize. Appropriate perches may reduce the distance an owl moves away from the burrow when disturbed and thus, reducing potential nest abandonment and predation risk. These would be placed at least one week prior to any construction activity. Perches would consist of wooden "T" stakes inserted into the ground or other materials that would be suitable for each specific occupied burrow and/or active nest. Prior to the implementation of perching methods, a plan will be submitted to the CDFG for concurrence.

2.3.5 Construction Restrictions

The following construction restrictions would be implemented where and when feasible to reduce impacts to burrowing owl and their occupied burrows and/or active nests. A reduced buffer plan will include options to manage impacts associated with the construction type, activity, and duration at each active nesting burrow. The primary goal would be to avoid take of active nesting burrowing owl burrows through the implementation of a 250 foot environmentally sensitive area buffer. Additionally, to avoid take of burrowing owl individuals, occupied burrows identified outside the nesting season will be avoided through the implementation of a 160 foot environmentally sensitive area buffer.

For active nesting burrows, a reduced environmentally sensitive area buffer may be implemented with approval from the CDFG. For occupied burrows identified outside the nesting season, the buffer may be reduced to 5 feet with notification provided to CDFG. If a buffer reduction greater than 5 feet is proposed, a plan must be submitted to CDFG for review and approval. If construction must occur inside of the buffer, a reduced buffer plan may include the following components: work will be conducted only outside the highest activity levels of the owls, defined as two hours after sunrise and two hours before sunset; construction activity that must pass an occupied burrowing owl burrow will be completed in a strategic fashion, to the greatest extent practicable, such that a burrowing owl does not flush into an area of potential mortality (i.e. a busy street); establishment of no parking, idling, or loitering zones along access roads leading to active construction areas; and shielding will be installed as a barrier to extreme mortality hazards such as busy roads.

2.4 Passive Relocation Process

If direct impacts to an occupied burrowing owl burrow are unavoidable, or the burrowing owl biologist determines that indirect impacts could cause occupied burrow abandonment, passive relocation will occur. Active relocation will not be conducted as part of this Plan.

Passive relocation (Trulio 1995) is the most common method of removing burrowing owls from sites prior to clearing/grubbing activities. One method of passive relocation involves the installation of one-way doors at the burrow entrance(s) outside of the nesting season. Clark and Plumpton (2005) present modified dryer vents as one-way doors. Alternatively, no one-way doors would be required if occupied burrows are actively monitored at dawn (1 hour before sunrise to 2 hours after sunrise) and dusk (2 hours before sunset to 1 hour after sunset) over a 48-hour period to monitor and document owl activities. When biologists have directly observed that all owls are away from their burrows, the burrows would be collapsed using approved methods. Burrows will be collapsed using hand tools. Burrows will be collapsed systematically to allow for visual inspection of each chamber prior to proceeding to the next chamber. If a scoping device is used, excavation of burrow chambers will be alternated with use of the scope to confirm that deeper chambers are unoccupied. Each burrow will be refilled with dirt and/or rocks to prevent reoccupation by burrowing owls or other species, such as San Joaquin kit fox. Passive relocation of owls and collapsing of burrows where passive relocation has taken place will follow the accepted protocol as described in the Burrowing Owl Consortium Protocol Guidelines (CBOC 1993).

The passive relocation process will start with creation of artificial burrows or the identification and enhancement of existing burrows on adjacent SCE-owned property with suitable habitat. Passive relocation will be conducted after burrows are installed or enhanced. Occupied burrows shall not be disturbed during the nesting season (1 February through 31 August) unless a qualified biologist approved by CDFG verifies through non-invasive methods that either the birds have not begun egg-laying and incubation or that juveniles from the occupied burrows are foraging independently and are capable of independent survival. Passive relocation outside of the nesting season may be permitted pending evaluation of detailed, site-specific passive relocation plans and receipt of formal written approval from the CDFG authorizing the passive relocation. The site-specific passive relocation plan would be submitted to CDFG for approval and would be provided to the CPUC.

2.4.1 Artificial Burrow Construction

Upon CDFG approval of the site-specific passive relocation plan, at least one week prior to the start of any relocation, artificial burrows will be constructed in adjacent, SCE-owned property with suitable habitat near the occupied burrow to be removed. The location of these artificial burrows will be strategically selected based on local site conditions, proximity of Cross Valley Loop Project disturbances, and property accessibility and land-ownership. The ultimate goal will be to relocate them as far from the work activity as feasible, but as close to the burrows being removed as possible. Artificial burrows will be constructed at a 2:1 mitigation ratio per burrowing owl observed to occupy burrows within the construction area.

2.4.1.1 Underground

As applicable, a backhoe or similar heavy equipment will be used to dig a trench for the burrow entrance and exit openings, accessway, and a nesting chamber. Based on methodologies outlined in the literature, each artificial burrow will consist of a nest box, composed of an upside down

sprinkler valve box, placed so the bottom is 4 feet underground so that the average temperature in the burrow will be approximately 75 degrees Fahrenheit. The open bottom of the nest box will have hardware cloth stretched across it to prevent potential predators from digging underneath it, as well as allow moisture to escape. Extending from the nest box will be an access tunnel made from black 4-inch flexible perforated irrigation hose (to prevent flooding of burrows due to rain events), and extending a minimum of 12 feet from the box. The first six feet of hose are laid at the same level as the box. The second six feet of hose are laid at 90 degrees from the first six feet and will slope gently upward to ground level. For protection from dogs and other predators, a rigid 6-inch PVC pipe will be used as a sleeve over the 4-inch flexible perforated irrigation hose. Each opening will also consist of an apron of dirt spread by hand to mimic the original burrow to the extent possible. White-painted stakes will be placed around the burrow openings to mark the burrow location and to attract burrowing owls.

2.4.1.2 Aboveground

An alternative design of an artificial burrow, a mound or aboveground burrow, may be utilized due to its attractiveness to burrowing owl (P. Bloom, personal communication) and when excavation is not permitted in an area. The artificial nest chamber and entrance tubes used are the same as for an underground burrow, except these items are arranged flat on the ground. Some soil is applied by hand to keep the nest chamber and tubes in place before a backhoe is used to build the mound. Soils should be piled to a five-foot depth on isolated mounds to approach the temperature stability of an underground burrow.

2.4.2 Existing Offsite Burrow Enhancement

Upon CDFG approval of the site-specific passive relocation plan, at least one week prior to the start of any relocation, natural existing burrows will be evaluated and enhanced in adjacent SCE-owned property with suitable habitat. The enhancement process will be completed in 3 general steps: (1) a burrow survey; (2) burrow evaluation; and (3) physical enhancement. The first step is to conduct a burrow suitability survey of adjacent areas of suitable habitat to determine the existence and suitability of existing burrows for burrowing owl. If burrows are found, the second step will be to complete a burrow evaluation. The evaluation process will include inspecting any natural burrows to determine that they appear vacant, in good condition (not susceptible to collapse), that the burrows entrance is intact, and that the burrow is of a sufficient depth to provide thermoregulation. Natural burrows meeting these conditions will be selected for physical enhancement (Step 3) based on local site conditions, proximity of Cross Valley Loop Project disturbances, and property accessibility and land-ownership. The ultimate goal will be to relocate them as far from the work activity as feasible, but as close to the burrows being removed as possible. Physical burrow enhancement can include constructing a substantial apron, securing and widening the burrow entrance, providing suitable perches adjacent to the burrow, and baiting the burrows with prey items to entice the displaced burrowing owls to the burrow vicinity. Existing burrow enhancement will be conducted at a 2:1 mitigation ratio per burrowing owl observed to occupy burrows within the construction area.

2.4.3 Passive Relocation

If direct impacts to an occupied burrowing owl burrow are unavoidable, or the CPUC-approved burrowing owl biologist determines that indirect impacts could cause occupied burrow

abandonment, a CDFG-approved passive relocation will be implemented. Specifically, qualified biologists will actively monitored at dawn (1 hour before sunrise to 2 hours after sunrise) and dusk (2 hours before sunset to 1 hour after sunset) over a 48-hour period to monitor owl activities. When biologists have directly observed that all owls are away from their burrows, the burrows would be collapsed using approved methods. Down-hole cameras may be used to determine vacancy and some burrows may require hand excavation to ensure no harm to burrowing owls. Once it is confirmed that burrowing owls are absent, the burrow is collapsed/removed and construction may be initiated. For occupied burrows and other vacant burrows within the disturbance footprint, all burrows will be collapsed once confirmed to be absent of burrowing owls. For other burrows not within the disturbance footprint but within the buffer during the nesting season, exclusionary devices may remain in place to prevent future burrowing owl occupation until construction is complete if described so in the implemented CDFG-approved passive relocation plan. All burrows located in the buffer will be preserved and not destroyed as they will be uncovered at the end of construction.

2.4.4 Monitoring

Monitoring will be conducted after the burrowing owl passive relocation process is complete, up until the onset of ground disturbance due to construction to ensure that owls do not re-establish themselves. The artificial burrows or enhanced replacement burrows will be monitored for a period that will be defined in the site-specific relocation plan to determine if they are being utilized by owls. The extent and timing of all monitoring will be detailed in the site-specific relocation plan. During the first breeding season (February 1 through August 31) after construction of the artificial burrows or the burrow enhancement, focused surveys following the CBOC guidelines (1993) will be conducted.

2.5 Reporting

For the Cross Valley Loop Project FEIR, SCE will be preparing daily monitoring logs, as well as weekly summary logs which will include information regarding work activities in areas with burrowing owl and any passive relocation activities. All reporting will be in compliance with the FEIR, and regulatory conditions.

Chapter 3
Species Overview

Qualified biologists have conducted burrowing owl habitat assessments and protocol-level focused surveys along the Cross Valley Loop transmission corridor in 2010 and 2011. The following section summarizes the data collected in 2010 and 2011.

3.1 Burrowing Owl Survey Results

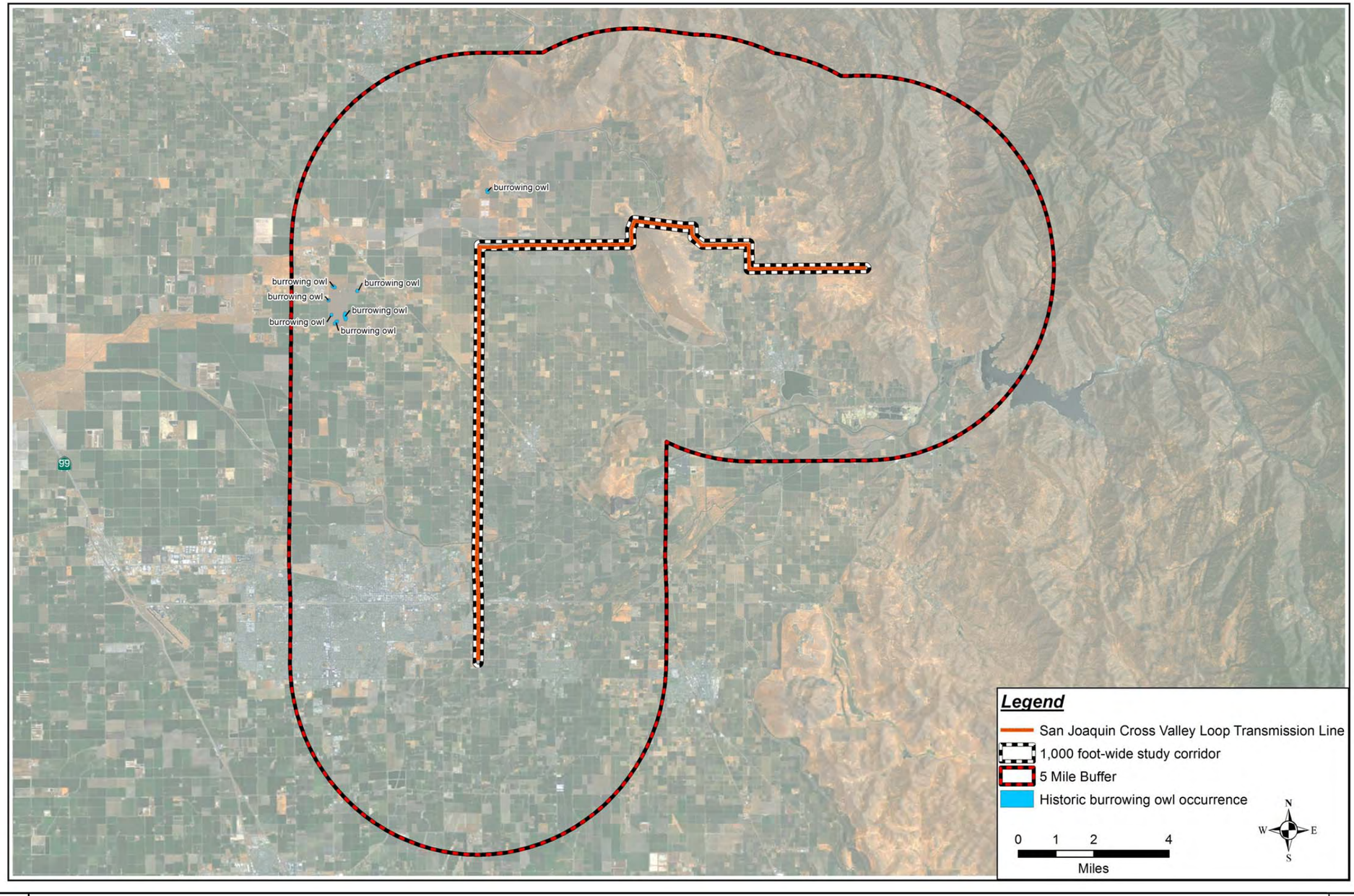
There are five historical records of the burrowing owl (EOID 69904, EOID 69899, EOID 69905, EOID 72574, and EOID 72586) listed within five miles of the transmission line route (Figure 3-1). The nearest occurrence (EOID 69905) is located approximately 1.4 miles north of the route. Two adults were observed at two burrows located approximately 0.8 mile east–southeast of St. Mary's Church just south of Sontag Ditch on February 9, 2006. The surrounding habitat consisted of California annual grassland and the Northern Claypan vernal pool (Quad Knopf 2011).

The western portion of the Cross Valley Loop transmission line between Rector Substation and the Friant-Kern Canal (approximately 15.3 miles of the total 23 mile transmission line) is characterized by intensive agricultural (i.e., orchards, vineyards, and row crops) and residential developments with little topographic relief (Figures 3-2a and 3-2b). These areas are less suitable to support burrowing owls. The remainder eastern eight miles of the transmission line, east of Friant-Kern Canal, crosses an area comprised of active rangeland in hummocky and rolling terrain consistent with southern Sierra Nevada foothill topography. Although there were a few burrows of suitable size to support burrowing owl occupancy (burrow entrance ≥ 5 inches diameter) west of Friant-Kern Canal, all of the burrowing owl sightings and active burrowing owl burrows were identified east of the Friant-Kern Canal during 2011 surveys (Figures 3-3a and 3-3b). This distribution is likely influenced by the prevalence of rangeland, primarily consisting of open annual grassland, typically preferred by burrowing owls within the eastern portion of the corridor (Quad Knopf 2011).

A total of four burrowing owl adults and two active burrows were identified by Quad Knopf within a 1,000 foot-wide study corridor, 500 feet to each side of the transmission center line for a total of 1,000 feet, (Figures 3-3a and 3-3b) east of the Friant-Kern Canal in 2011 (Quad Knopf 2011). One of the adult burrowing owls (ID 3) was associated with a burrow determined to be active in 2011 based on the presence of cast pellets and prey remains near the burrows entrance. ID 3 was located approximately 150 feet north of the transmission center line. Another adult burrowing owl (ID 5) was sighted approximately 150 feet from the transmission line and 100 feet from active burrow ID 3; and an additional adult burrowing owl (ID 6) was located approximately 230 feet north of the 1,000 foot-wide study corridor (730 feet from the transmission center line). It should be noted that each of these three sightings (ID 3, ID 5, and ID 6) may have been associated with the same individual, since they were made on separate survey dates. The second active burrow (ID 2) was identified less than 350 feet south of active burrow and adult ID 3, although no adult was observed near its entrance. Neither of these two burrows was found to be intact during subsequent visits; cattle-grazing was suspected to have been the cause of both burrow collapses. The fourth burrowing owl (ID 4) was identified near the east terminus of the study corridor approximately 500 feet from the transmission center line. Burrowing owl ID 4 appeared to be a transient forager because it was

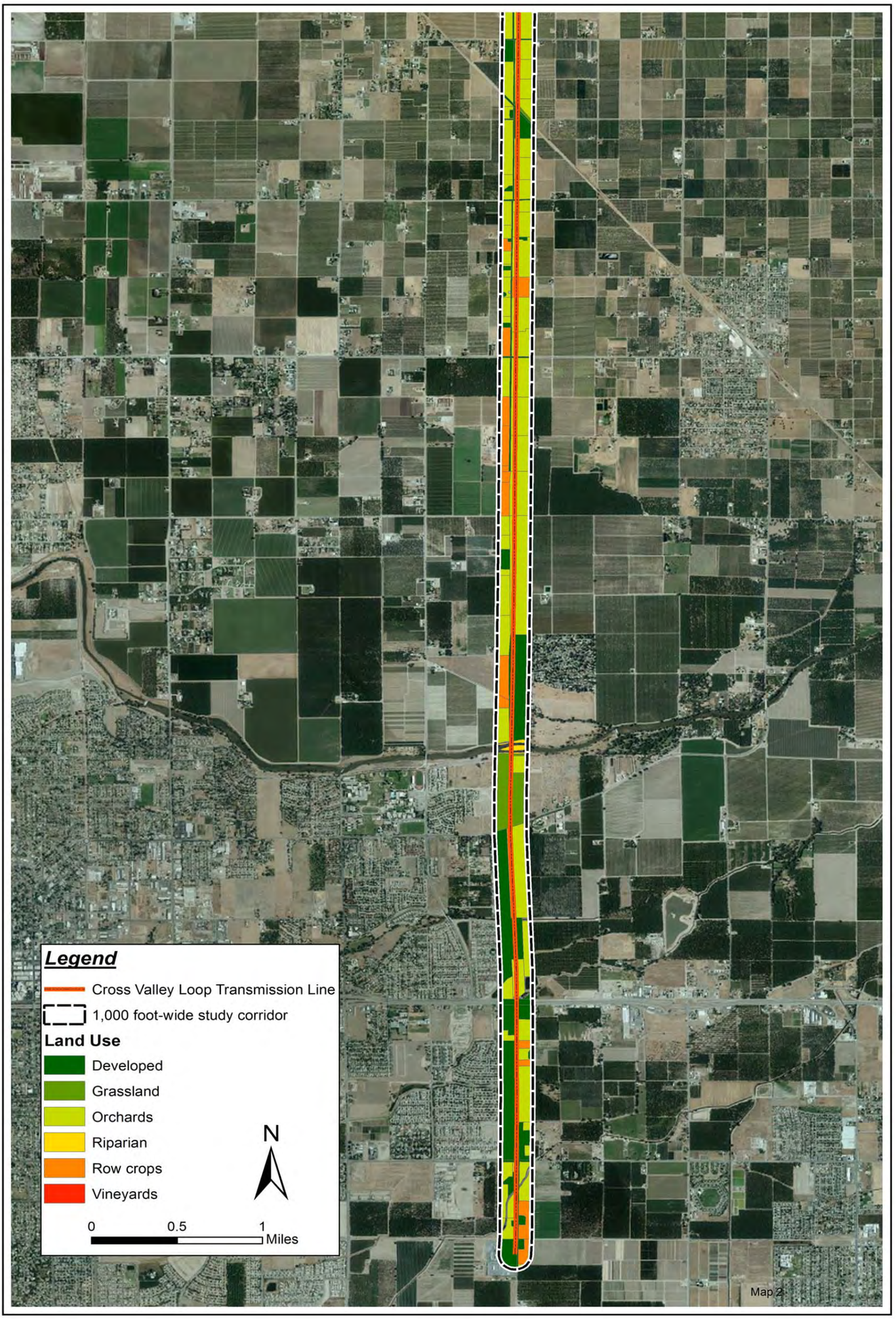
not associated with any active burrows. Additionally, a fifth burrowing owl (ID 1) was observed near an active burrow approximately 0.5 mile south of the eastern end of the transmission line study corridor, well outside of the study corridor. All of the sightings were made between October 19, 2010, and August 4, 2011.

In accordance with MM 4.4-5 and CBOC, a qualified biologist will conduct preconstruction surveys for burrowing owls 14 to 30 days prior to the start of each new construction phase. Additional burrowing owl burrows may be identified based on future surveying. These burrows will be assessed on a case-by-case basis and in accordance with the strategies outlined in this Plan.



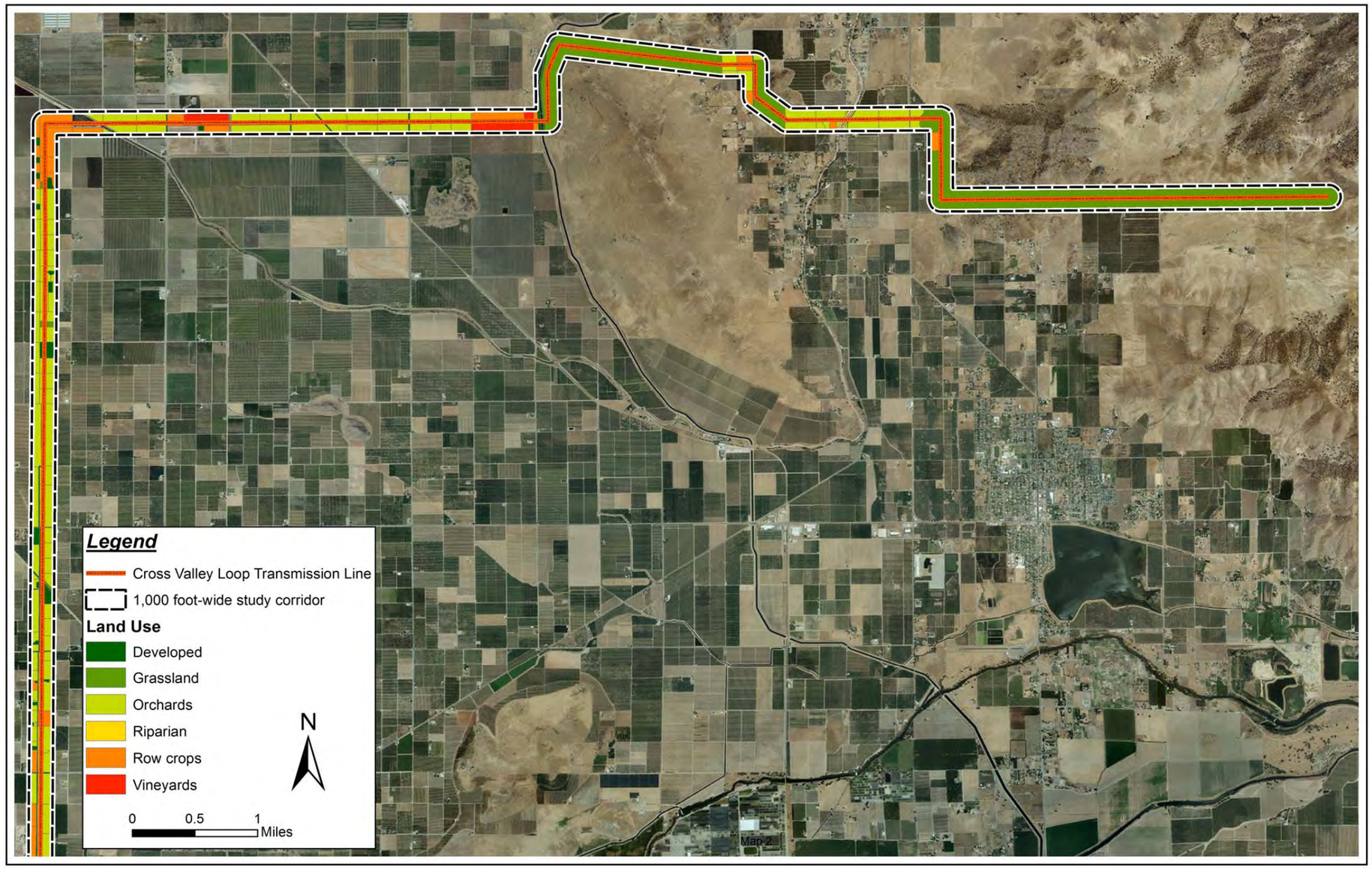
HISTORIC OCCURRENCE OF BURROWING OWLS IN CROSS VALLEY LOOP PROJECT AREA

Figure 3-1



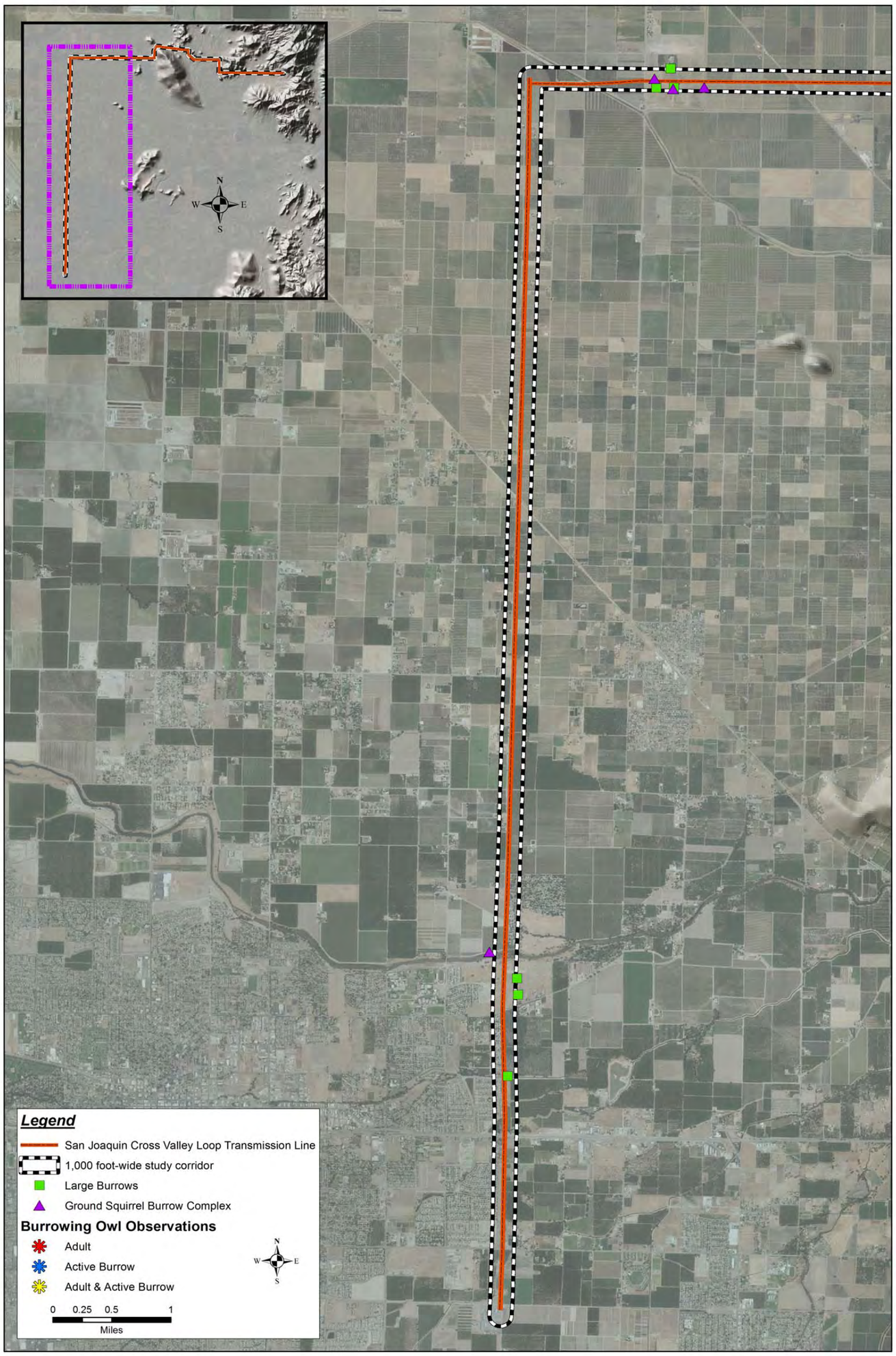
CROSS VALLEY LOOP PROJECT LAND USE

Figure
3 - 2a



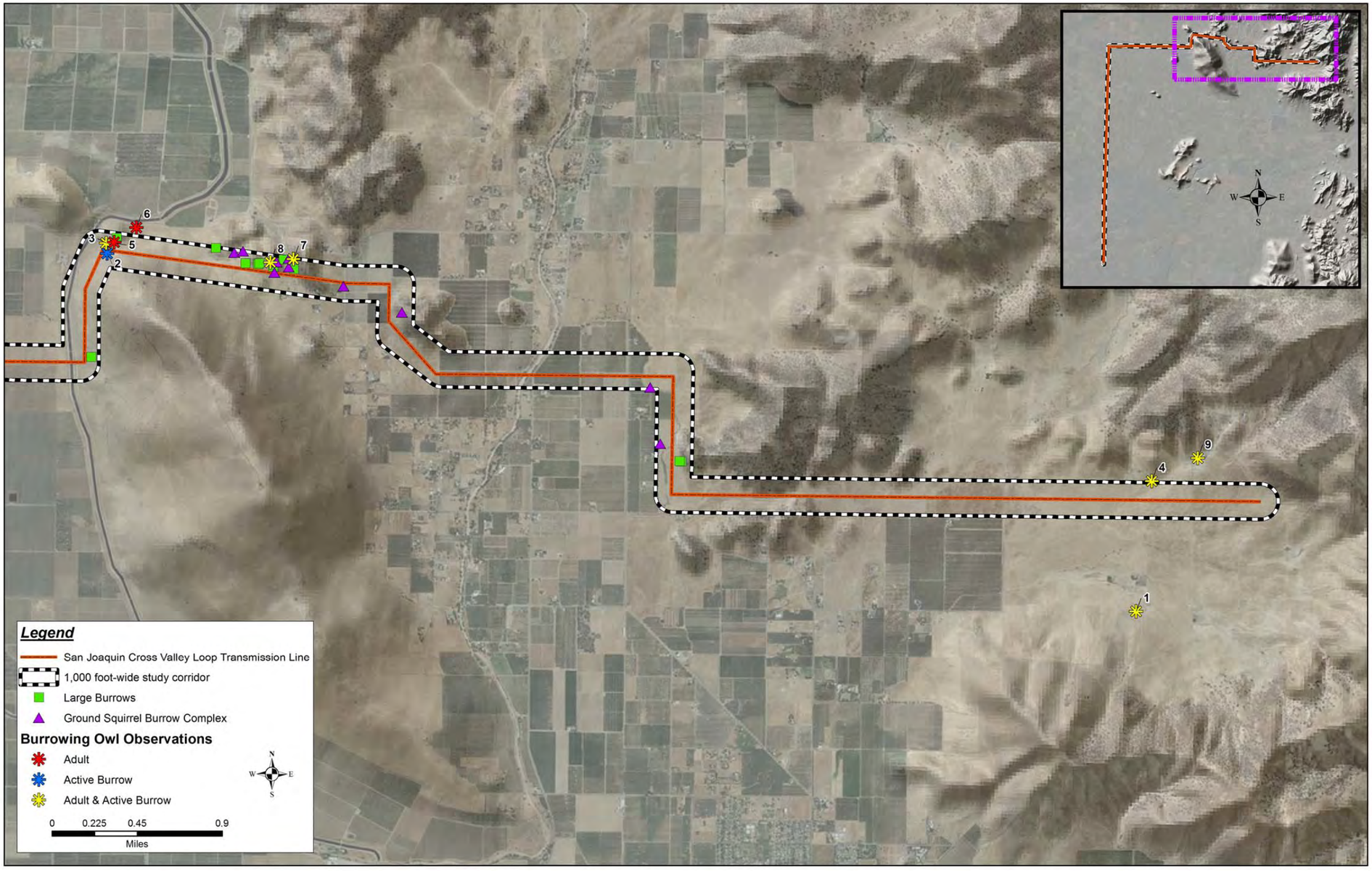
CROSS VALLEY LOOP PROJECT LAND USE

Figure 3-2b



RECENT BURROWING OWL POTENTIAL BURROWS AND OBSERVATIONS IN THE CROSS VALLEY LOOP TRANSMISSION CORRIDOR

Figure 3 - 3a



RECENT BURROWING OWL POTENTIAL BURROWS AND OBSERVATIONS IN THE CROSS VALLEY LOOP TRANSMISSION CORRIDOR

Figure 3 - 3b

Chapter 4
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Attachment G

Bird Nest Data Summary

Attachment G
Bird Nest Data Summary

Southern California Edison Tehachapi Renewable Transmission Project, Segments 1 to 3 (TRTP), 2008

The Tehachapi Renewable Transmission Project (TRTP) Segments 1 to 3 is a series of new and updated electric transmission lines and substations that will deliver electricity from new wind farms in the Tehachapi area to SCE customers and the California transmission grid. The California Public Utilities Commission (CPUC) approved TRTP Segments 1 to 3 in March 2007 and construction of Segments 1, 2, and 3a has been completed as of December 2009 and the segments are fully energized. Work continues on the restoration plans for these completed segments. Construction of Segment 3b is still underway. The connection of Segment 3b to Windhub is part of the project intended to meet interconnection needs by Renewable Generators. The construction of these non-network transmission facilities will begin when sufficient capacity on the lines is requested by generators.

Segment 1 includes approximately 26.5 miles of 500kV transmission lines from the Antelope Substation in Lancaster to the Pardee Substation in Santa Clarita. The project includes installation of 117 new steel-lattice support towers, substation modifications, optical ground wire installation, new access roads, and improvements to existing access roads (SCE 2011a). Segment 2 includes 21.0 miles of new 500 kilovolt transmission line and 220 kilovolt transmission lines and modifications at the Vincent substation to Lancaster. Segment 3a includes 25.6 miles of 500 kilovolt and 220 kilovolt transmission lines connecting SCE's Antelope Substation in Lancaster to a new substation west of Mojave in Kern County. Segment 3b includes 9.6 miles of 220 kilovolt transmission lines from Mojave to east of Tehachapi.

During the 2008 nesting season, nest monitoring detected 57 bird nests in the survey area associated with the TRTP, Segments 1 to 3. These nests included sixteen species. Eighteen were observed to have fledged successfully during the monitoring season. All nest buffers were initially set to 300 feet. Some nest buffers were reduced, but only with approval by the California Department of Fish and Game (CDF&G).

American Crow (*Corvus brachyrhynchos*)

Two American crow nests were observed in vegetation during TRTP construction biological monitoring during the 2008 nesting season. Chicks successfully fledged from one of the nests. The success of the other nest is unknown because all work and associated monitoring was completed prior to fledging.

Bewick's Wren (*Thryomanes bewickii*)

One Bewick's wren nest was observed on the ground near a newly constructed road during TRTP construction biological monitoring in 2008. This nest was apparently abandoned.

Bullock's Oriole (*Icterus bullockii*)

One Bullock's Oriole nest was detected in natural vegetation in the survey area for tower construction biological during TRTP construction monitoring in 2008. Chicks fledged about 1 month after the nest was first detected.

California Quail (*Callipepla californica*)

Two California Quail nests were detected on the ground in the vicinity of tower construction during TRTP construction biological monitoring in 2008. Eggs were observed on one nest. The other was obscured by scrub vegetation and could not be observed directly. Birds did not fledge during construction monitoring. Neither nest had fledged by the completion of construction monitoring.

California Towhee (*Pipilo crissalis*)

One California Towhee was detected on vegetation within three feet of the edge of a road during TRTP construction biological monitoring. After the initial detection, no activity was observed at the nest.

Common Raven (*Corvus corax*)

A total of 13 common raven nests were observed during TRTP construction biological monitoring in 2008. Nesting sites included trees, power support towers, and cliffs. Chicks successfully fledged from three of the nests and, and two nests failed. The remaining nests were not monitored to nest completion.

House Finch (*Carpodacus mexicanus*)

Nineteen house finch nests were detected during TRTP construction biological monitoring in 2008. Nests were located in support towers, construction equipment, Of the nineteen house finch nests detected, six successfully fledged and eight failed. Construction and associated monitoring ended before the fate of the other nests could be determined.

Killdeer (*Charadrius vociferus*)

One killdeer nest was detected outside of the Mojave Yard during TRTP construction biological monitoring in 2008. Young successfully fledged from this nest.

Lesser Goldfinch (*Spinus psaltria*)

One nest was detected outside of the Mojave Yard during TRTP construction biological monitoring in 2008. A buffer area of about 8 to 10 feet was established around the nest. Construction and biological monitoring were completed prior to fledging.

Northern Mockingbird (*Mimus polyglottos*)

One northern mockingbird was detected during TRTP construction biological monitoring in 2008. This nest was abandoned prior to completion.

Red-tailed hawk (*Buteo jamaicensis*)

Two red-tailed hawk nests were detected on structures during TRTP construction biological monitoring in 2008. The adults abandoned one of the nests and, with approval from USFWS, BMD, Aspen, and CDFG, the eggs were relocated to the Wildlife Rescue Center. However, the eggs failed to hatch. No specific reason for nest abandonment was noted during biological monitoring. Young from the other nest appeared to have fledged successfully.

Rufous-Crowned Sparrow (*Aimophila ruficeps*)

One rufous-crowned sparrow was detected in natural vegetation about 110 feet away from a project work area during TRTP construction biological monitoring in 2008. A buffer of 100 feet was established and the nest was observed on several occasions. However, no eggs were laid, and the nest was determined to be inactive.

Violet Green Swallow (*Tachycineta thalassina*)

Violet green swallows were observed flying into a crack in a cliff face in the survey area during TRTP construction biological monitoring in 2008. Further monitoring did not detect nesting activity.

Western Bluebird (*Sialia mexicana*)

One western bluebird was detected in a construction trailer during TRTP construction biological monitoring in 2008. An attempt to remove the nest material upon detection, but a few days later the bird was seen bringing food to the site. Two weeks later bluebirds were seen flying in & out of the cavity, but 17 days after discovery, no bluebirds were seen so the nest was considered inactive.

Western Kingbird (*Tyrannus verticalis*)

Nine western kingbird nests were detected on project structures during TRTP construction biological monitoring in 2008. Of these, four fledged young successfully. One of the nests was relocated, two were abandoned, one appeared to have been preyed on by common ravens, and the outcome of the other nest could not be determined.

Western Scrub-Jay (*Aphelocoma californica*)

One possible scrub jay nest was detected in a construction trailer during TRTP construction biological monitoring in 2008. However, the nest was never occupied during monitoring.

Southern California Edison Tehachapi Renewable Transmission Project (TRTP), Segments 1 to 3, 2009

During the 2009 nesting season, nest monitoring detected 176 bird nests in the survey area associated with the TRTP, Segments 1 to 3 project. These nests included 24 species and 23 nests where the birds that constructed them were not seen or identified. Twenty-one nests were observed to fledge successfully during the monitoring season. All nest buffers were set to 300 feet in 2009, except as described below.

American Kestrel (*Falco sparverius*)

Two American Kestrel nests were detected on a structure during TRTP construction biological monitoring in 2009. One nest was not monitored (monitor notes do not explain why). The other was presumed to have fledged, although this could not be verified.

Ashy-throated Flycatcher (*Myiarchus cinerascens*)

Two ashy-throated flycatcher nests were detected during TRTP construction biological monitoring in 2009. One located on vegetation was presumed to have fledged. The other, located in a tower section (banana) was abandoned after sky crane activity and failed.

Bushtit (*Psaltriparus minimus*)

Two bushtit nests were detected during TRTP construction biological monitoring in 2009. These nests were in vegetation located 150 to 200 feet from the project. Both nests were active at the time they were discovered but were not monitored.

California Towhee (*Pipilo crissalis*)

Two California towhee nests were detected during TRTP construction biological monitoring in 2009. One was located 20 feet from a tower, and failed (eggs did not hatch). The other was located approximately 6 feet off of an access road and 150 feet from a tower. This nest was not monitored.

Common Raven (*Corvus corax*)

Common raven nests were among the most numerous bird nests, 44 were detected during TRTP construction biological monitoring in 2009. Forty-one of the common raven nests were located on towers; two were located in construction yards, and one in vegetation. Partial nests at 14 locations were removed, and many of these were rebuilt and removed more than once. In addition, several nests fell to the ground or otherwise were lost. Four nests were active when identified, but not monitored through to fledging.

European Starling (*Sturnus vulgaris*)

Two European starling nests were detected during TRTP construction biological monitoring in 2009. These nests were located in towers with no construction activity and were not monitored.

Goldfinch - Other (Fringillidae)

One goldfinch (either an American or lesser) nest was detected high in a deodar cedar located 20 feet from a structure removal. With CDFG approval the structure was removed. The biologist monitor reported that one bird remained on the nest during the work, and that the other member of the pair returned to the nest. Since work was complete, the nest was not monitored to completion.

Great Blue Heron (*Ardea herodias*)

Two great blue heron nests were detected during TRTP construction biological monitoring in 2009. One was an inactive located in a tower. This nest was temporarily removed and stored so that it could be re-erected after work was completed. The other great blue heron was located in a tree located 200 feet from the work area. Since no work occurred at the site until late summer, the nest was not monitored.

Great Horned Owl (*Bubo virginianus*)

One great horned owl nest was detected during TRTP construction biological monitoring in 2009. The nest had been identified previously and was located in a juniper bush 150 feet from the construction area. This nest fledged young successfully in 2009.

House Finch (*Carpodacus mexicanus*)

Forty-nine house finch nests were detected during TRTP construction biological monitoring in 2009. Four nests that were located in equipment or materials in construction yards fledged young successfully. Twenty-three nests failed from predation or other loss of eggs from the nests. Two of the nests were inactive when first discovered. The remainder of the nests were not in active construction areas and were not monitored.

House Wren (*Troglodytes aedon*)

One house wren was detected in vegetation during TRTP construction biological monitoring in 2009. This nest fledged successfully.

Hummingbird – Other

One house wren was suspected in vegetation during TRTP construction biological monitoring in 2009. Because the nest was out of sight of construction activity it was not monitored during construction.

Lark Sparrow (*Chondestes grammacus*)

One lark sparrow nest was detected during TRTP construction biological monitoring in 2009. This nest was located on the ground 100 feet from a tower site. Although the birds appeared easily agitated and may have been affected by construction activity, they fledged young successfully.

Loggerhead Shrike (*Lanius ludovicianus*)

Two loggerhead shrike nests were detected during TRTP construction biological monitoring in 2009. One was 120 feet east of a tower, and was lost with no discernable cause. The other nest was located along an access road. The outcome of that nest was not determined.

Mourning Dove (*Zenaida macroura*)

Two mourning dove nests were detected during TRTP construction biological monitoring in 2009. One was located 200 feet from the work area. Neither nest was monitored.

Red-tailed hawk (*Buteo jamaicensis*)

Eighteen red-tailed hawk nests were detected during TRTP construction biological monitoring in 2009. One nest on a tower successfully fledged, four were active but were not monitored long enough to determine the outcome, the others were partial nests that were removed from towers with approval from CDFG. Red-tailed hawks showed persistence in their continued nesting attempts despite continued nest removal.

Red-winged Blackbird (*Agelaius phoeniceus*)

More than ten red-winged blackbird nest were detected at the Pardee construction yard during TRTP construction biological monitoring in 2009. Nests were removed until it was determined that there would not be continued work at the yard. The remainder of the nests were left and monitoring was discontinued.

Sage Sparrow (*Amphispiza belli*)

Three sage sparrow nests were detected during TRTP construction biological monitoring in 2009. Young birds fledged successfully from two of the nests, one located 50 feet from an access road and 200 feet from a crane pad, and the other located 50 feet from a tower. Eggs were never laid at the third nest.

Spotted Towhee (*Pipilo maculates*)

One partial spotted towhee nest was detected during TRTP construction biological monitoring in 2009. This nest was never completed.

Swallow – Other (*Hirundinidae*)

Swallows were observed entering and leaving a small hole in a bank located 40 feet from an access road during TRTP construction biological monitoring in 2009. Young are presumed to have fledged from this nest location.

Unknown

Twenty one unidentified bird nests were detected during TRTP construction biological monitoring in 2009. Six of these nests were removed before eggs were laid, four were inactive, and the others were not within active construction areas and so were not monitored.

Western Kingbird (*Tyrannus verticalis*)

Ten western kingbird nests were detected during TRTP construction biological monitoring in 2009. Six of these nests failed for reasons that were not discernable. One of the nests was inactive and was removed from a structure. The other nests were not in active construction areas and were not monitored.

Western Scrub-Jay (*Aphelocoma californica*)

Three western scrub jay nests were detected during TRTP construction biological monitoring in 2009. One nest was lost to predation, another nest that was located 200 feet from a tower construction disturbance area failed for unknown reasons, and the other nest was not monitored after construction was completed, so the outcome is unknown.

Wren (Troglodytidae)

Chicks were observed in the nest of an unidentified wren species in a nest located in a small hole in the east bank of a road cut during TRTP construction biological monitoring in 2009. These birds are presumed to have fledged.

Wrentit (*Chamaea fasciata*)

One wrentit nest was detected during TRTP construction biological monitoring in 2009. The nest was located within 100 feet of a tower. The monitor advised no work at the site until fledging occurred. Young fledged successfully.

Southern California Edison Tehachapi Renewable Transmission Project (TRTP), Segments 4 to 11, 2010

The Tehachapi Renewable Transmission Project (TRTP) consists of new/upgraded substations and a total of 175 miles of transmission line segments. Project work will include transmission tower component and substation installation, road construction, line-pulling and vehicle parking, and involve the use of cranes, transport trailers, and miscellaneous vehicles. The TRTP passes through the Cities of Lancaster and Palmdale, the Antelope Valley in the western Mojave Desert, spans the Sierra Pelona and San Gabriel Mountains within the Angeles National Forest (ANF), and extends through the San Gabriel Valley to the City of Ontario.

In 2010, construction on the TRTP, Segments 4 to 11 project was initiated during the nesting season in Segments 7, 8, 10, and the Vincent Substation. Segment 7 includes the reconstruction of approximately 16 miles of an existing 220 kV transmission line to 500-kV standards, between the Mesa substation in Monterey Park and the Rio Hondo substation in Baldwin Park (SCE 2011b). Segment 10 includes building a new single-circuit 500-kV transmission line traveling approximately 16.8 miles in new ROW between the approved Windhub Substation and the proposed new Whirlwind Substation (component of Segment 9). Segment 8 of the TRTP includes rebuilding approximately 33 miles of existing Chino-Mesa 220-kV T/L to 500-kV standards from a point approximately two miles east of the existing Mesa Substation (the "San Gabriel Junction") to the existing Mira Loma Substation. In addition, the Segment 8 component also includes rebuilding approximately seven miles of the existing Chino-Mira Loma No. 1 line from single-circuit to double-circuit 220-kV structures. The Vincent Substation project is a component of Segment 9 and includes rerouting of portions of two existing 220-kV lines into Vincent Substation using currently idle towers. An upgrade and expansion of the existing Vincent Substations will be completed to accommodate new 500-kV and 220-kV equipment. The total Vincent expansion footprint is approximately 20 acres.

During the 2010 nesting season, biological monitoring during construction of the TRTP, Segments 4 to 11 detected 144 nests belonging to 26 species of birds. Buffer distances ranged from 0 to 300 feet and the distance from nests to the worksite varied from 0 to over 300 feet. Monitoring generally did not continue during the entire duration of a nest, so fledging success was generally not determined.

Acorn Woodpecker (*Melanerpes formicivorous*)

One acorn woodpecker nest was entered in the nesting bird database from the TRTP in 2010. However, the comments associated with this nest refer to a burrowing owl burrow. It appears that either this species or the observation was incorrectly entered.

Allen's Hummingbird (*Selasphorus sasin*)

One Allen's Hummingbird nest was detected during biological monitoring for the TRTP in 2010. The nest buffer was 99 feet. The outcome of this nest was not monitored.

American Goldfinch (*Spinus tristis*)

Two American goldfinch nests were detected during biological monitoring for the TRTP in 2010. The nest buffers were both 300 feet. The outcomes of these nests were not monitored.

Bewick's Wren (*Thryomanes bewickii*)

One Bewick's wren nest was detected during biological monitoring for the TRTP in 2010. The nest buffer was 300 feet. The outcome of this nest was not monitored.

Black Phoebe (*Sayornis nigricans*)

One black phoebe nest was detected during biological monitoring for the TRTP in 2010. The nest buffer was 300 feet. The outcome of this nest was not monitored.

Bullock's Oriole (*Icterus bullockii*)

Five Bullock's oriole nests were detected during biological monitoring for the TRTP in 2010. The nest buffers were 300 feet. The outcomes of these nests were not monitored.

Burrowing Owl (*Athene cunicularia*)

Three burrowing owl nests were detected during biological monitoring for the TRTP in 2010. The nest buffers were 250 feet. The outcomes of these nests were not monitored.

Bushtit (*Psaltriparus minimus*)

Six bushtit nests were detected during biological monitoring for the TRTP in 2010. The nest buffers were 300 feet. The outcomes of these nests were not monitored.

California Quail (*Callipepla californica*)

One California quail nest was detected during biological monitoring for the TRTP in 2010. The nest buffer was 300 feet. The outcome of this nest was not monitored.

California Thrasher (*Toxostoma redivivum*)

One California thrasher nest was detected during biological monitoring for the TRTP in 2010. The nest buffer was 300 feet, although distance to work is approximately 417 feet. The outcome of this nest was not monitored.

California Towhee (*Pipilo crissalis*)

Nine California towhee nests were detected during biological monitoring for the TRTP Project in 2010. The nest buffers were between 0 and 300 feet. One of these nests fledged young successfully. The outcome of the other nests was not monitored.

Coastal Cactus Wren (*Campylorhynchus brunneicapillus*)

Six coastal cactus wren nests were detected during biological monitoring for the TRTP in 2010. The nest buffers were 150 to 300 feet. The outcomes of these nests were not monitored.

Common Raven

Five common raven nests were detected during biological monitoring for the TRTP in 2010. The nest buffers were 0 to 300 feet. Two nests did not appear to be active. The outcome of the other nests was not monitored.

Great Horned Owl (*Bubo virginianus*)

One great horned owl nest was detected during biological monitoring for the TRTP in 2010. The nest buffer was 100 feet. This nest successfully fledged.

Hooded Oriole (*Icterus cucullatus*)

Three hooded oriole nests were detected during biological monitoring for the TRTP in 2010. The nest buffers were 300 feet. The outcomes of these nests were not monitored.

House Finch (*Carpodacus mexicanus*)

Fifty-four house finch nests were detected during biological monitoring for the TRTP in 2010. The nest buffers were 0 to 300 feet. The outcomes of these nests were not monitored.

Killdeer (*Charadrius vociferus*)

One killdeer nest location was detected during biological monitoring for the TRTP in 2010. The nest buffer was 300 feet. The outcome of this nest was not monitored.

Loggerhead Shrike (*Lanius ludovicianus*)

One loggerhead shrike nest was detected during biological monitoring for the TRTP in 2010. The nest buffer was 300 feet. The outcome of this nest was not monitored.

Mourning Dove (*Zenaida macroura*)

Sixteen mourning dove nests were detected during biological monitoring for the TRTP in 2010. The nest buffers were 50 to 300 feet. The outcomes of these nests were not monitored.

Northern Mockingbird (*Mimus polyglottos*)

Twelve northern mockingbird nests were detected during biological monitoring for the TRTP in 2010. The nest buffers were 0 to 300 feet. The outcomes of these nests were not monitored.

Other

Seven unidentified bird nests were detected during biological monitoring for the TRTP in 2010. The nest buffers were 300 feet. The outcomes of these nests were not monitored.

Red-tailed hawk (*Buteo jamaicensis*)

Three red-tailed hawk nests were detected during biological monitoring for the TRTP in 2010. The nest buffers were 300 feet. One nest fledged young successfully. The outcomes of these nests were not monitored.

Red-winged Blackbird (*Agelaius phoeniceus*)

One red-winged blackbird nest was detected during biological monitoring for the TRTP Project in 2010. The nest buffer was 300 feet. Young fledged successfully from this nest.

Song Sparrow (*Melospiza melodia*)

One possible song sparrow nest site was detected during biological monitoring for the TRTP in 2010. Adults were seen transporting nest building materials. The nest buffer was 300 feet. The outcome of this nests was not monitored.

Western Kingbird (*Tyrannus verticalis*)

One western kingbird nest was detected during biological monitoring for the TRTP in 2010. The nest buffer was 300 feet. The outcome of this nest was not monitored.

Western Scrub-Jay (*Aphelocoma californica*)

Two western scrub jay nests were detected during biological monitoring for the TRTP in 2010. The nest buffers were 300 feet. The outcomes of these nests were not monitored.

El Casco System Project, 2010

The El Casco System project includes construction of the 28 acre El Casco Substation in the Norton Younglove Reserve in Riverside County, upgrades to the Zanja and Banning Substations located in Yucaipa and Banning, about 15.4 miles of transmission line upgrades, and telecommunications improvements (CPUC 2011a). Construction in the vicinity of the nests noted by the biologists monitoring nests during the 2010 monitoring season included: foot traffic, vehicle traffic, underground and tower mounted fiber optic cable installation, cable splicing, materials storage and access.

During the 2010 nesting season, biological monitoring during construction at the El Casco System Project detected 75 nests belonging to 22 species of birds. Buffer distances ranged from 25 to 300 feet and the distance from nests to the worksite varied from 0 to over 300 feet. Chicks fledged from 48 nests. Seventeen nests failed, and the remainder was either still active when construction and associated monitoring ceased, or were inactive for reasons that could not be determined.

American Crow (*Corvus brachyrhynchos*)

One American crow nest was detected during biological monitoring of the El Casco System Project. The buffer for this nest was 50 feet; the nest was located in a tree 50 feet from access and 360 feet from construction. Fledging was confirmed at this nest.

American Goldfinch (*Spinus tristis*)

One American goldfinch nest was detected during biological monitoring of the El Casco System Project. The buffer for this nest was 25 feet; the nest was located in a tree 25 feet from intermittent traffic on an access road. Fledging was confirmed at this nest.

Anna's Hummingbird (*Calypte anna*)

Five Anna's hummingbird nests were detected during biological monitoring of the El Casco System Project. The buffers for these nests were all 25 feet. Fledging occurred at two nests, one nest was abandoned, and construction and monitoring was completed prior to fledging of the other two nests. The one nest that failed was built low in a chain-link fence with no concealing vegetation. The failed nest was built during construction and foot and vehicle traffic was frequent within about 5 feet of the nest.

Bewick's Wren (*Thryomanes bewickii*)

Two Bewick's wren nests were detected during biological monitoring of the El Casco System Project. The buffers for these nests were both 25 feet, although the nearest work was located 150 feet away from both of the nests. Neither nest could be observed directly, due to dense foliage. Monitoring ended prior to fledging at either nest.

Black-Chinned Hummingbird (*Archilochus alexandri*)

One black-chinned hummingbird nest was detected during biological monitoring of the El Casco System Project. The buffer for this nest was 25 feet; the nest was located in a tree approximately 100 feet from an access road. This nest appears to have been lost to predation.

Bushtit (*Psaltriparus minimus*)

Two bushtit nests were detected during biological monitoring of the El Casco System Project. The buffers for these nests were both 25 feet, although the nearest work (intermittent road access) was located 60 to 85 feet from the nests. One nest disappeared entirely, possibly due to raccoon predation. Monitoring ended prior to fledging at the other bushtit nest.

Cassin's Kingbird (*Tyrannus vociferans*)

One Cassin's kingbird nest was detected during biological monitoring of the El Casco System Project. The buffer for this nest was 25 feet; the nest was located in a fan palm 50 feet from an access road. This nest appears to have successfully fledged.

Cliff Swallow (*Petrochelidon pyrrhonota*)

Several cliff swallow nests in one location under a bridge were detected during biological monitoring of the El Casco System Project. The buffer for this nest location was 25 feet. Since the nests were located on a bridge with road traffic, no monitoring was required.

Common Raven (*Corvus corax*)

Five common ravens were detected during biological monitoring of the El Casco System Project. The buffers for these nests were 100 to 300 feet. Fledging occurred at four of the nests. One nest located 40 to 50 feet above the ground in a lattice tower failed prior to fledging. It appeared that one of the adults of the failed nest pair was disabled. No work occurred within 300 feet of this failed nest between the time it was known to be active and when it was reported lost.

Cooper's Hawk (*Accipiter cooperii*)

One Cooper's hawk nest was detected during biological monitoring of the El Casco System Project. The buffer for this nest was 300 feet; the nest was located in a eucalyptus tree approximately 300 feet from the road. This nest successfully fledged.

Great Horned Owl (*Bubo virginianus*)

One great horned owl nest was detected during biological monitoring of the El Casco System Project. The buffer for this nest was 100 feet; the nest was located in a eucalyptus tree approximately 90 feet from a road. A coyote was seen eating a chick on the ground and there was no sign of other chicks so the nest was considered lost.

House Finch (*Carpodacus mexicanus*)

Twenty six house finch nests were detected during biological monitoring of the El Casco System Project. The buffers for these nests were all 25 feet, except for one nest that was built in the I-beam support of a trailer. A 10 foot buffer was approved for that nest, and the immediate area was flagged off to prevent access. That nest was one of 19 that successfully fledged. Of the nests that failed, three were abandoned, one was lost to predation, and the chicks died in one nest died of unknown causes. The outcome of the other nest was not discernable.

House Wren (*Troglodytes aedon*)

Three House wren nests were detected during biological monitoring of the El Casco System Project. The buffers for these nests were all 25 feet. Two of the nests fledged successfully and one failed. The successful nests were located 25 and 50 feet and behind sound barriers from construction. The failed was located 150 feet and behind a sound barrier from construction activity. However, the failed nest appeared to have been preyed on by a pair of ash-throated flycatchers.

Lawrence's Goldfinch (*Spinus lawrencei*)

One Lawrence's goldfinch was detected during biological monitoring of the El Casco System Project. The buffer on this nest was 25 feet, although the nearest work (access road) was 140 feet away. This nest successfully fledged.

Lesser Goldfinch (*Spinus psaltria*)

Seven lesser goldfinch nests were detected during biological monitoring of the El Casco System Project. The buffers for these nests were all 25 feet. Three of the nests fledged successfully, three were lost to predation, and one was located in dense foliage 23 feet up in a cottonwood tree where it was not possible to discern the outcome.

Northern Mockingbird (*Mimus polyglottos*)

One northern mockingbird nest was detected during biological monitoring of the El Casco System Project. This nest in an ornamental shrub had a 25 foot buffer, although the young apparently fledged when no construction work was occurring.

Northern Rough-Winged Swallows (*Stelgidopteryx serripennis*)

One northern rough-winged swallow nest was detected during biological monitoring of the El Casco System Project. This nest was located in a hollow support of a water tower 25 feet from an access road. This nest apparently fledged successfully at a time when there was no construction activity nearby.

Nuttal's Woodpecker (*Picoides nuttallii*)

One Nuttal's woodpecker nest was detected during biological monitoring of the El Casco System Project. The nest buffer was 25 feet, and no heavy work was allowed within 50 feet of the nest. The

nearest work was 100 feet away, and behind a sound barrier. This nest appeared to have fledged young successfully.

Red-tailed hawk (*Buteo jamaicensis*)

Two red-tailed hawk nests were detected during biological monitoring of the El Casco System Project. Both nest had 300 foot buffers and young fledged successfully from both nests.

Say's Phoebe (*Sayornis saya*)

One Say's phoebe nest was detected in the understructure of a PCS trailer during biological monitoring of the El Casco System Project. A 10 foot buffer was established, limiting activity around the trailer to the front side, away from the nest. However, one egg and one nestling were found dead and a third nestling either fledged or died.

Western Bluebird (Sialia mexicana)

Two western bluebird nests were detected during biological monitoring of the El Casco System Project. Both nest had 25foot buffers and young fledged successfully from both nests. These nests were located 70 to 75 feet from an access road entrance, and road traffic was the only construction activity.

Western Kingbird (*Tyrannus verticalis*)

Five western kingbird nests were detected during biological monitoring of the El Casco System Project. All of these nests were located in power system components (insulators, power poles, and on top of a capacitor). Buffers were 25 feet on all of these nests. Young fledged successfully from four of the five nests. The other nest failed, although the monitor noted that the birds showed no signs of disturbance from nearby work.

Kimball Substation Project, 2010

The Kimball Substation Project includes construction of a new substation in Chino, CA, modification of approximately 6.7 miles of 66 kV subtransmission lines, and addition of additional circuits above and below ground, and installation of fiberoptic cable and telecommunications equipment to connect the Kimball Substation to SCE's existing telecommunication system (CPUC 2011b).

During the 2010 nesting season, biological monitoring during construction at the Kimball Substation and associated transmission lines detected 140 nests belonging to 20 species of birds. Buffer distances ranged from 0 to 400 feet and the distance from nests to the worksite varied from 0 to 600 feet. Chicks fledged from 76 nests. Forty-one nests failed, and the remainder were either still active when construction and associated monitoring ceased, or were inactive for reasons that could not be determined.

American Avocet (*Recurvirostra Americana)*

One American avocet nest was detected in the vicinity of the project and was monitored for impacts, although it was located approximately 600 feet from project activities. Young successfully fledged during the monitoring period.

American Crow (*Corvus brachyrhynchos*)

Eighteen American crow nests were detected during construction monitoring at the Kimball Substation project and associated transmission work. Buffer distances varied from 0 to 200 feet and the distance from the nest to the worksites varied from 0 to 400 feet. No buffers were established for nests that were constructed after project work was already underway, since these birds were clearly acclimated to the construction activity. Eight of the nests fledged, including two nests with no buffer that were located at the corner of the project site. Of the ten nests that failed, three were likely lost to predation, three appeared to have been abandoned due to territorial conflicts with other American crows, and four were abandoned for no discernable reason.

American Goldfinch (*Spinus tristis*)

Two American goldfinch nests were detected. Both were separated from the project by a major road (Kimball Avenue), so no buffer was established. These nests were 146 and 180 feet from project activities. One of these nests failed due to predation, as the nest was removed from the tree in which it had been built. The fate of the other nest is not known, as it was not affected by the project and was not monitored through fledging or failure.

Barn Swallow (*Hirundo rustica*)

One barn swallow nest was detected 300 feet from a pole construction site. A 300 foot buffer was established. Young birds fledged from this nest.

Black Phoebe (*Sayornis nigricans*)

Eight black phoebe nests were detected during construction monitoring at the Kimball Substation and associated transmission lines. Buffer distances of 30 to 300 feet were established from these nests. Seven of the nests fledged successfully. One pair of Black Phoebe successfully fledged young and began raising a second brood during the monitoring period. The other nest was located in a culvert and it was not possible to determine the outcome of that nest.

Black-Necked Stilt (*Himantopus mexicanus*)

Seven black-necked stilt nests were detected on properties near the Kimball Substation project site. Buffer distances were 280 to 600 feet, and were on the opposite side of a major roadway (Kimball Avenue) from the project site. During the monitoring period, five of the 6 nests fledged successfully, and the sixth nest had young on the nest at the time of the last observation.

Brewer's Blackbird (*Euphagus cyanocephalus)*

Four Brewer's Blackbird nests were observed during biological monitoring of the Kimball Substation project. Three of the nests were on the opposite side of a major roadway (Kimball Avenue) from the project site, and the fourth was separated from the project by a fence. Buffer distances were 50 to 80 feet. These nests were presumed to have been successful, although fledging was not observed since there was no project work or monitoring occurring at the time.

Bullock's Oriole (*Icterus bullockii*)

Two Bullock's orioles were detected during biological monitoring of the Kimball Substation project. One of the nests was on the opposite side of a major roadway (Kimball Avenue) from the project site. Buffer distances were 25 to 145 feet. One nest were presumed to have been successful, although fledging was not observed since there was no project work or monitoring occurring at the time. The other nest was abandoned for unknown reasons, although it was noted that landscaping work unrelated to the Kimball Substation project occurred in the vicinity of the nest.

Cassin's Kingbird (*Tyrannus vociferans*)

Four Cassin's Kingbird nests were detected during biological monitoring of the Kimball Substation project. Nests were located in a transmission tower, a wooden transmission support pole, and in trees. Buffers were 50 to 300 feet. One nest fledged successfully, one the other nests became inactive while there was no construction activity or monitoring, so the fate of these nests was not determined.

Cliff Swallow (*Petrochelidon pyrrhonota*)

One cliff swallow nest was detected during biological monitoring of the Kimball Substation project. The nest buffer was 100 feet and the nest was separated from the project by heavy traffic on Schleisman Road. Young successfully fledged from this nest.

House Finch (*Carpodacus mexicanus*)

Six house finch nests were detected during Kimball Substation construction monitoring. Nests were located in support towers, construction equipment, buildings, and trees. Buffer distances ranged from 25 to 400 feet. Of the house finch nests detected, two successfully fledged and the outcome of the other four could not be determined during monitoring.

Killdeer (*Charadrius vociferus*)

Eight killdeer nests were detected during Kimball substation biological monitoring. Buffers of 100 to 370 feet were established. Of the eight nests that were monitored, three successfully fledged, two were disturbed by non-SCE human activity unrelated to the Kimball Substation project, one appeared to have failed due to predation, and the fate of the others could not be determined during monitoring.

Lesser Goldfinch (*Spinus psaltria*)

One lesser goldfinch nest was detected during Kimball substation biological monitoring. This nest was located in a tree on the opposite side of a major roadway and about 100 feet from the project activity. Because of the roadway, no buffer was established around this nest. The nest was lost prior to fledging, possibly from naturally occurring high winds at the time.

Loggerhead Shrike (*Lanius ludovicianus*)

Two loggerhead shrike nests were detected during Kimball substation biological monitoring. A 100 foot buffer was established from one of the nests, the other was inactive prior to construction so no buffer was established. Both nests appeared to have failed due to predation.

Mourning Dove (*Zenaida macroura*)

Thirteen mourning dove nests were detected during Kimball substation biological monitoring. Buffer distances ranged from 30 to 300 feet. Young successfully fledged from two of the nests. Eight nests failed; six from predation, and two were abandoned for unknown causes. The outcome of the remaining nests could not be determined during monitoring, and may have fledged.

Northern Mockingbird (*Mimus polyglottos*)

Twelve northern mockingbird nests were detected during Kimball substation biological monitoring. Buffer distances of 20 to 200 feet were established. Eight of the nests successfully fledged, and four failed during the monitoring. Two of the nests failed to predation, one was located in a tumbleweed that apparently blew away, and one was abandoned after landscaping sprinklers (unrelated to the Kimball Substation project) damaged the nest.

Red-tailed hawk (*Buteo jamaicensis*)

Three red-tailed hawk nests were detected during Kimball substation biological monitoring. All were located in trees located on nearby properties. Buffers ranged from 80 to 300 feet. Young birds

successfully fledged from two of the nests. The one nest that failed was abandoned after trash blew onto the nest. There was no SCE activity in the area at the time the nest was abandoned.

Red-Winged Blackbird (*Agelaius phoeniceus*)

Five red-winged blackbirds were detected during Kimball substation biological monitoring. The nests were all located in vegetation on adjacent properties. Buffer distances were 250 to 300 feet. One of the nests fledged successfully. One nest was destroyed by non-SCE personnel mowing vegetation, and the vegetation supporting the other three failed nests collapsed or was knocked over and the nests apparently subject to predation.

Song Sparrow (*Melospiza melodia*)

Twenty song sparrow nests were detected during Kimball substation biological monitoring. These nests were located in tumbleweeds and grasses. Buffers were 30 to 300 feet. Young birds fledged successfully from sixteen of the nests. Three nests failed; two appeared to have been knocked over by high winds, and the third was built on grass at ground level, and was apparently lost to predation.

Western Kingbird (*Tyrannus verticalis*)

Twelve western kingbird nests were detected during Kimball substation biological monitoring. Nest buffers were 0 to 300 feet. Five nests were successful, fledging young during the monitoring period. One nest was abandoned, probably due to the close proximity of a red-tailed hawk nest. The other nests had not yet fledged young at the time that construction was complete and monitoring ended.

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Attachment H

Effects of Human Activity on Reproductive Success in Birds

ATTACHMENT I

EFFECTS OF HUMAN ACTIVITY ON REPRODUCTIVE SUCCESS IN BIRDS

H. Lee Jones and Peter H. Bloom

INTRODUCTION

In May 2010, Bloom Biological, Inc. (BBI) was asked by Southern California Edison (SCE) to recommend a set of minimum allowable buffers, or set-backs, from construction activity to avoid disruption of active bird nests and remain in compliance with government regulations against take. The result of that effort can be found in the SCE Tehachapi Renewable Transmission Project (TRTP), Segments 4–11: Draft Nesting Bird Management Plan. The purpose of this paper is to provide justification for the buffers recommended by BBI and to describe the rationale behind their derivation.

The Migratory Bird Treaty Act (MBTA) states, in part, that "it shall be unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, kill, [or] attempt to take, capture, or kill…any migratory bird, [or] any part, nest, or eggs of any such bird…." Additionally, the California Fish and Game Code Section 3503 states that "It is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto." Section 3503.5 specifically states that "It is unlawful to take, possess, or destroy any birds in the orders Falconiformes or Strigiformes (birds-of-prey) or to take, possess or destroy the nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto."

Construction projects that remove habitat for birds generally run little risk of violating either the MBTA or the applicable California Fish and Game codes; however, during the nesting season they do run a significant risk of destroying, either directly or indirectly, nests recently built or rebuilt and about to receive eggs, viable eggs, nestlings, and fledglings still unable to engage in sustained flight. For these reasons the resource agencies and the California Public Utilities Commission (CPUC) require that utility companies and other companies or persons that engage in construction projects where birds may nest make every reasonable effort to avoid "take" of migratory and native non-game birds as defined in these regulations. An effective way to minimize take is by restricting such work to areas far enough away from active nests (i.e., through the establishment of buffer zones) to assure that the parents do not abandon the nest as a result of construction-related disturbance. Such disturbance can take the form of excess noise, movement of vehicles and construction equipment, general human activity near a nest, or direct destruction of a nest during normal construction activities. In order to make every reasonable effort to avoid take, SCE has employed biologists qualified to locate and monitor active nests and establish an appropriate buffer zone around each nest within which work is to be restricted until the young have fledged and are free-flying.

BBI, ICF and SCE share the same mutual intent to err on the side of the resource, in this case the success of each native bird's nesting attempt that is potentially impacted by the TRTP project. The challenge is to determine how large a buffer zone is necessary to minimize the chance of take. Bird species respond differently to human related disturbances, and individuals of a species often respond differently as well, potentially due to their degree of direct human experience, making the establishment of adequate buffer zones even more challenging. Buffer zones that are unnecessarily large can result in costly project delays; whereas buffers that are too small can result in unnecessary failure of a nest or take.

During the 2010 nesting season in southern California, SCE-employed ornithologists and biological monitors implemented buffer zones of varying sizes and monitored nests within these restricted zones to determine the of each nest. Some *de facto* buffer zones were more than adequate (for example, a 400-foot buffer zone for a house finch nest) because no construction work was planned in the area of the

nest. Others were only as large as necessary to avoid nest abandonment while allowing construction activities to proceed outside the buffer zone. These nests were closely monitored for signs of disturbance that could result in abandonment, and when necessary, the buffer size was increased or work was suspended in the area until the nest was no longer active and the fledged young were capable of sustained flight.

BBI biologists analyzed the nest data from 2010 for two SCE projects in Southern California, the El Casco System Project that extends from Mentone and Redlands to Banning, and the Kimball Substation Project in eastern Chino, both in southwestern San Bernardino County. A total of 207 nests of 32 different species were monitored during construction of these two projects. Nest data recorded for the TRTP, while extensive, was not suitable for types of analyses on the relationship between nest success rates and buffer size conducted for this study.

DEFINITIONS

Three terms used throughout this paper are defined with respect to their use herein. "Active nests" and "successful nests" are terms that have been interpreted in a variety of ways, and there is no one correct definition. "Minimum allowable buffer" is also defined.

Active Nest

Active nests of native bird species are protected in the State of California by both State and federal law as stated above. The MBTA in particular states that it is unlawful to take any migratory bird or its nest or eggs. While the U.S. Fish and Wildlife Service (2000) has clarified that the federal regulations do not pertain to inactive nests, the regulations at both the State and federal levels never clearly define what an active nest is. Indeed, many publications in the ornithological literature use the term "active nest", but never precisely define the term. It is likely, therefore, that most authors assume that the term "active nest" is implicit and needs no further explanation. One notable exception regarding raptors, however, is Postupalsky (1974) who defined an active nest "as a nest in which eggs had been laid". This definition was subsequently followed by Baral and Gautam (2007) in a study of vultures in India. From regulatory bodies, the Virginia Department of Game and Inland Fisheries (2010) defined an active Osprey (*Pandion haliaetus*) nest as "a nest containing eggs or occupied by dependent (flightless) young."

A variety of environmental assessments have defined the term "active nest" within their mitigation measures. In an Environmental Assessment for Dyess Air Force Base, CDM (2007), it was stated that "an active nest is defined as a nest that contains eggs, hatchlings, or other signs of activity." As part of a Habitat Conservation Plan in Solano County, LSA Associates (2009) defined an active nest for raptors as "a site (i.e., tree) at which nest building/refurbishment, egg-laying, incubation, or feeding of young is occurring. Nesting shall be considered complete once the young have fledged and are capable of flight or the adults have abandoned the nest for a minimum of seven days." Also, in the case of raptors, the U.S. Bureau of Land Management (2008) defined an active nest for a Resource Management Plan as "any nest that has been occupied in the last seven years".

The 2010 nest data and the analyses of that data in this report define an active nest as one that contains one or more eggs or young. For future work, this definition may change to include nests that are under construction, at least for some groups of birds like raptors and special status species.

BBI has a long history of working with birds of prey which may or may not add fresh nesting material to a nest, depending upon the family (Falconidae, Cathartidae) or order (Strigiformes), or in the case of non-raptors, the Caprimulgiformes, that lay eggs on the ground with no nest. Based upon the ecology and behavior of distinct avian species, BBI views an active nest of any bird species as one that has had recent sticks added to it during the normal nesting season or in the case of non-stick utilizing species, a

pair in the nest cavity, or ledge, etc., exhibiting courtship rituals typically leading to copulation with or without eggs being laid.

Successful Nest

In this study, a successful nesting attempt is defined as a nest from which a minimum of one young has fledged regardless of how many eggs were laid or how many young hatched. Although the fate of the young after fledging and prior to their ability to maintain sustained flight and thus avoid construction equipment was not considered in our nest success calculations, to the best of our knowledge no dependent young were killed directly or indirectly from construction or construction-related activities in 2010, so success rates would not have been affected if dependent young had been included.

Other studies have defined nest success in different ways, making it difficult to compare the results of one study with the next. For example, many studies in the literature have looked at annual success rates, which may combine two or more broods(e.g., McClure 1943 and Hochachka et al. 1989). Others have defined reproductive success in terms of the number of young produced in a season by one pair (e.g., Blancher and Robertson 1984) or the mean number of young produced per nest (e.g., Gamble et al. 1996 and Tweit and Tweit 2000). Still others (e.g., Hochachka et al. 1989) compare male and female fecundity (i.e., number of offspring produced) separately. There also is a large difference between the number of young fledged/active nest vs. the number of young fledged/successful nest. Only those publications that give the percentage of nests that produced at least one fledgling, or for which that figure can be derived, are cited for comparative purposes in this report.

Minimum Allowable Buffer

Minimum allowable buffers are the smallest buffer zones allowable that provide protection of nesting birds from a level of disturbance that would cause abandonment of the nest. In most cases, these were the initial buffers established, to be expanded if and when the nesting birds showed any sign of agitation. In some cases, larger buffers were established initially, then shortened if the biological monitor determined that a reduced buffer would not unduly disturb the nesting pair. The minimum allowable buffers were the ones used in computing nesting success.

The red-tailed hawk (*Buteo jamaicensis*) provides a good example of why minimum buffer zones must be considered on a case-by-case basis. It is a raptor that predictably and frequently nests on utility towers and that exhibits a wide range of responses to various forms of human disturbance near their nest. While BBI has suggested that a 300-foot buffer will be adequate for some pairs to prevent nest abandonment (ICF International and Bloom Biological, Inc. 2011), the majority of pairs are much less tolerant, and depending upon the intensity and duration of the human disturbance, may abandon their nesting attempt for that year. In most cases, the buffer will need to be increased due to the intolerance of some pairs. By example, if incubating eggs or brooding small young, many adults will depart their nest if the adjacent tower is climbed. Most pairs nesting in more natural areas such as the Angeles National Forest or on the Antelope Valley floor will not tolerate a human on their nest tower or an adjacent tower even when more than 300 feet away. Breeding pairs that have selected substation towers are generally relatively tolerant, the obvious difference being that substation pairs receive a near constant daily variety of stimuli from a wide range of distances to their nesting towers, including vehicular traffic and other substation operation and maintenance activities.

SUMMARY OF THE LITERATURE

BBI could find few published papers on the minimum size buffer zones should be in order to protect nesting birds from human disturbance, but a number of papers indirectly address this issue and are

described below. We address separately the effects of human activity on nesting birds and the effects of anthropogenic noise and traffic on nesting birds.

Effect of Human Intrusion on Nesting Birds

While a number of studies in the literature have addressed the effects of human disturbance on birds, few if any have attempted to correlate distances from construction and construction-related activities with the degree of reproductive success in birds, and more specifically, to provide recommendations for establishing adequate no-work buffer zones to minimize disturbance. Studies that have correlated human intrusion with degree of reproductive success include Gramza (1967), Ellison and Cleary (1978), Tremblay and Ellison (1979), Westmoreland and Best (1985), Rodgers and Smith (1995), Gutzwiller et al. (1997), Swarthout and Steidl (2003), Weidinger (2008), and Grubb et al. (2010).

Perhaps most relevant among these studies is the one by Weidinger (2008). Weidinger found that nest predation on open-nesting songbirds did not increase after repeated nest monitoring visits, especially in situations where nest densities in man-altered habitats are high. Stated another way, overall nest success was not negatively influenced by periodic nest-visitation, which is consistent with most previous studies on songbirds (Gotmark 1992, O'Grady et al. 1996, Mayer-Gross et al. 1997, Ortega et al. 1997). However, the Weidinger study and at least one previous study (Mayer-Gross et al. 1997) suggest that observer effect differs among songbird species within a given study system and that conclusions drawn from one study cannot be generalized, not only across ecologically distant groups (e.g., colonial seabirds vs. songbirds; Gotmark 1992) but also within ecologically similar groups (e.g., open-nesting songbirds). The Weidinger study showed that, apart from nesting habitat and nest site, the local predators and nest-defense ability of different species groups (here, thrushes vs. Old World warblers) should be considered when assessing an observer effect on nest predation. Weidinger stressed that further studies would be needed to assess possible species-specific observer effects.

In another study that indirectly relates to the effects of human intrusion on nesting songbirds, Gutzwiller et al. (1997) found that some bird species curtail singing bouts when humans intrude into their defended breeding territory, the presumption being that the intrusion thus diminishes the quality of those sites for producing young. These effects develop in the absence of habitat alteration or other detectable ecological changes. However, the results of the study were equivocal, with no detectable effect in most instances, but with a significant effect in a few instances. For some species under some circumstances, levels of intrusion as low as one or two hours per week during the breeding season can reduce the occurrence and weekly consistency of primary song (Gutzwiller et al. 1994). Primary song is important for securing territories, attracting mates, and maintaining pair bonds (Searcy and Andersson 1986, Radesater et al. 1987, Welty and Baptista 1988, Kelsey 1989). Because human intrusion can influence singing behavior (Gutzwiller et al. 1994), it has the potential to influence the seasonal timing of primary song and, therefore, the timing of important breeding activities.

Other studies have examined the effects of human disturbance on colonial waterbirds. Birds that nest in colonies are especially susceptible to human disturbance because of their high-density nesting habits. In a study in Florida, Rodgers and Smith (1995) examined flushing response distances of birds and used this information to determine set-back distances for observing waterbird nesting colonies. They found that most birds were more susceptible to humans approaching their colony on foot than they were to approaching motorboats. They determined that set-back distances (i.e., buffer zones) of 100 meters were adequate to protect colonies of wading birds (herons, ibises, and storks) from observers on foot, and 180 meters was adequate to buffer mixed tern/skimmer colonies from human disturbance.

Tremblay and Ellison (1979) found that visits to black-crowned night-heron (*Nycticorax nycticorax*) colonies just before or during laying provoked abandonment of newly constructed nests and either direct predation of eggs or abandonment of eggs followed by predation. Investigator disturbance later in

the nesting cycle caused mortality of young in some situations. Frequent disturbance also discouraged the settlement of late-nesting night-herons, late clutches being more likely in colonies visited only twice than in colonies visited 10-15 times. Clutch size and fledging success of successful early nests were the same in frequently and infrequently disturbed colonies.

Ellison and Cleary (1978) found that frequent visits to double-crested cormorant (*Phalacrocorax auritus*) colonies caused nest abandonment and gull predation under some circumstances and discouraged late-nesting birds from settling in disturbed experimental colonies. Initiation of late clutches was found to be more prevalent in relatively undisturbed control colonies. Interestingly, birds were less susceptible to disturbance in the second year of their study, but for some reason other than habituation. Thus, Ellison and Cleary's results were somewhat inconclusive in that behavior of birds was profoundly different in the second year. In both years, human intrusion early in the nesting cycle caused more nest failures than later in the nest cycle, which is consistent with other studies.

In a study on the effects of disturbance on mourning dove (*Zenaida macroura*) nesting success, Westmoreland and Best (1985) compared nests for differences in daily survival probabilities and discrepancies in the relationships between nest-site features and nesting outcome. At 3-day intervals, attending adults were flushed from disturbed nests; whereas undisturbed nests were checked from a distance so that adults did not flush. Disturbed nests had significantly lower daily survival probabilities. This trend was evident during both the incubation and nestling stages, but was significant only during the former. For disturbed nests, two nest-site features (nest-bowl depth and nest support) were related to success. In contrast, success of undisturbed nests was related to four variables (substrate height above nest level, relative light intensity above the nest, nest concealment, and nest width). These results indicate that standard nest-checking procedures influence nesting success and confound interpretation of relationships between nest-site features and nesting outcome.

It is clear from these studies that the effects of human intrusion on reproductive success are equivocal. Effects vary both between and within species according to the nature of intrusion, type of intrusion (e.g., walking humans vs. motorboats), intrusion frequency, susceptibility to predation (e.g., cormorants nesting near gull colonies), and other parameters.

Effect of Noise and Traffic on Nesting Birds

Noise is another factor that has been widely assumed to play a role in relative reproductive success in birds. Studies that specifically address or allude to noise as a disturbance factor include those by Platt (1977), Andersen et al. (1989), Ellis et al. (1991), Delaney et al. (1999), Palmer et al. (2003), and Hathcock et al. (2010). For example, noise compatibility standards, noise ordinances, and environmental noise regulations generally place thresholds of "acceptable" external noise levels for human comfort at 60 to 65 dBA depending on the location and circumstances. Construction activities resulting in persistent noise levels above these thresholds typically require mitigation, often the construction of a sound wall between the construction zone and the receptor area. Consistent with these established thresholds, for nesting songbirds and listed species, construction related noise levels above 60 dBA typically require mitigation to reduce these noise levels to less than 60 dBA. This requirement dates back at least to the late 1980s, prior to any definitive scientific research on the effects of noise on wildlife. Therefore, any extrapolation of "acceptable" noise thresholds for humans to noise thresholds for impacts on wildlife prior to 1990 would have been speculative.

A number of scientific studies conducted in the last 25 years, however, have addressed the issue of noise-related disturbance in birds, especially noise associated with air traffic. In one of the earlier studies, Ellis et al. (1991) found that noise levels from low-flying jet aircraft were not associated with reproductive failure in the various species of raptors they studied. Delaney et al. (1999) examined the effects of helicopter noise on Mexican spotted owls (*Strix occidentalis lucida*) and found that the owls did

not flush when helicopters were more than 105 meters away. On the other hand, Loe and Beyers (in press) recommend a "limited operating period" (LOP) within 0.25-mile of an active California spotted owl nest in all southern California national forests. Johnson and Reynolds (2002) examined the effects of noise from low-flying jet aircraft on the Mexican spotted owl and found that the owls' responses to low-flying F-16 jets did not exceed responses to natural events. In a recent study, Hathcock et al. (2010) determined that Mexican spotted owl nest site selection in suitable breeding habitat at the Los Alamos National Laboratory was not affected by peak noise levels of 80 dBA generated during nearby explosives tests. On the other hand, Platt (1977) found that nesting gyrfalcons (*Falco rusticolus*) exposed to spring helicopter overflights were less likely to reoccupy the same nest site the following year than were other gyrfalcons, and Palmer et al. (2003) found subtle effects of overflying jets on the parental behavior of peregrine falcons (*Falco peregrinus*). But they found no evidence that the falcons' pattern of nest attendance differed by exposure to such overflights.

Andersen et al. (1989) compared the behavioral responses of nesting red-tailed hawks to recently initiated low-flying helicopter overflights with responses of nesting red-tails to long established low-flying helicopter overflights. Predictably, they found that 53% of birds in an area where low-flying overflights were recently initiated, as opposed to 8% in an area where low-flying overflights had been occurring for nearly 40 years. However, these overflights did not appear to influence nesting success at either study area.

In apparent contrast to these studies, researchers studying the effects of highway traffic noise on songbirds in Europe reached different conclusions. For example, Reijnen and Foppen (1994) found that willow warbler (*Phylloscopus trochilus*) nesting populations close to roads in Britain were less dense and were less successful at breeding than birds nesting farther from roads. They considered noise to be possibly an important contributing factor. In a subsequent paper, Reijnen et al. (1995) investigated the importance of noise from and visibility of cars as possible factors affecting density of 43 woodland species. A regressive model with noise load as the only independent variable produced the highest correlation. When visibility of cars was controlled, the number of species showing density reductions was much higher on plots with a high noise load than on ones with a low noise load.

That the impacts of traffic noise may not apply universally comes from a study closer to home on California gnatcatchers (*Polioptila californica*) nesting in the rights-of-way of several major thoroughfares, including Interstate 8, in San Diego County. Famolaro and Newman (1998) found that gnatcatchers nested frequently enough in both natural and restored coastal sage scrub habitat adjacent to these highways to warrant planting suitable coastal sage scrub in highway landscaping. They concluded that "[b]ecause California Gnatcatchers use highway rights-of-way so extensively, additions, improvements, and maintenance should be implemented…to avoid or minimize adverse effects to areas occupied or potentially occupied by the species."

Similarly, the senior author and others have observed that California gnatcatcher population densities in the Montebello Hills near downtown Los Angeles are not diminished adjacent to Montebello Boulevard, a four-lane divided highway adjacent to the property (unpublished data from a study in progress). In northwestern Riverside County, least Bell's vireos (*Vireo bellii pusillus*) nesting along a narrow riparian corridor immediately adjacent to both the Union Pacific railroad line and San Timoteo Canyon Road have shown a 2400% increase in the past ten years, primarily due to the removal of invasive plant species, subsequent restoration of native vegetation, and trapping and removal of brown-headed cowbirds (*Molothrus ater*), a brood parasite (Aimar, Hoffman, and Zembal 2010). Yet up to 60 trains a day, each producing noise levels in excess of 90 dBA, pass within a few yards of nesting vireos for a distance of more than five miles in this same area (SCE, unpubl. data).

DERIVATION OF MINIMUM ALLOWABLE BUFFER ZONES AROUND ACTIVE NESTS

While the literature on the relationship between human activity and nesting success in birds has some utility, there is very little on how large effective buffer zones around bird nests must be in order to minimize the negative effects on reproduction. For this reason, our recommendations for minimum allowable buffers around active nests in the Nesting Bird Management Plan (ICF International and Bloom Biological, Inc. 2011) are based on our collective experience with many species, extrapolations to other species, and our knowledge (from professional experience and the literature) of the effects of nest monitoring, noise, general human activity, human-induced predation, etc. on nest success.

The minimum buffers we recommend in the NBMP are just that, the minimum distance under ideal circumstances at which the effects of light construction activity[1] should be minimal. Buffers should be increased, or work stopped[2], at the first sign of disturbance.

Results of 2010 Nest-Monitoring Studies for Two SCE Projects in Southern California

During the 2010 nesting season, SCE employed biologists to find and monitor active nests and establish buffer zones around these nests in an effort to prevent nest failure as a result of construction and construction-related activities. Buffer zones varied widely from site to site and according to the perceived sensitivity of each species to disturbance. In many instances, nests were well removed from work areas and no buffer zone was required. In these cases, the distance from the nest to the nearest work area was recorded, and this distance became a *de facto* buffer zone. These nest monitoring results were recorded on spreadsheets which included a description of the nest site, whether or not the birds successfully fledged young, and if not, the perceived reason for nest failure, and the nature of work in the area. We have analyzed the results of these data and have highlighted eight species or species groups which collectively account for more than 70% of the nest data obtained. Interestingly, for all but one species or species group for which more than ten or more nests were monitored[3], we found an inverse relationship between size of the buffer zone and reproductive success. In other words, on average, the smaller the buffer zone, the greater the chance of reproductive success in all the birds for which sufficient nest data are available. This seemingly surprising result has several plausible explanations. As Weidinger (2008) suggests, humans in the vicinity of active nests may have a deterrent effect on predators during and for up to two hours after their presence. As long as the human activity does not visibly disturb the adult birds (e.g., flushing from the nest, visible agitation, or nest defense), the resulting slight to moderate decrease in nest predation would confer an advantage on the pair's effort to successfully fledge young. In assuring that construction-related activity is restricted to a distance beyond which the birds become agitated, the mere presence of closely monitored construction activity in the area would discourage diurnal predators like crows and jays for the length of time the activity is underway and for a short time afterward.

The 2010 nest data for the five species, two species pairs, and one species triplet discussed below and summarized in Table 1 were adequate to give rough estimates of reproductive success. Although the reproductive success for these species appears to compare favorably with success rates in general, data from the literature typically show annual success rates (percentage of pairs fledging at least one young in a year) rather than "per brood" success rates, so the figures are often not directly comparable. For some species, no information on reproductive success is available. In the accounts below, reproductive success rates obtained from the literature, where comparable, are compared and contrasted with the success rates found in our study.

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[1] Light construction activity is considered to be foot traffic, manual labor, and the temporary use of motor vehicles and light construction equipment such as a bobcats, manlifts, utility trucks, or bucket trucks (NBMP, Section 2-1).

[2] Certain critical construction activities cannot be stopped immediately when a nest is found or a known nest is disturbed. These are listed and discussed at the end of this appendix.

[3] For phoebes (10 nests), this was not the case.

Table 1. Summary of results for species with 10 or more monitored nests.

				Buffer Range		Average Buffer Size	
Species	Monitored Nests	Nests That Fledged Young	Nests That Failed	All Buffers	Buffers Used in Analyses	Nests That Fledged Young	Nests That Failed
House Finch	28	21 (75%)	7 (25%)	5-400 ft	5-30 ft	23.2ft (n = 19)	24.2 ft (n = 7)
American Crow	27	15 (56%)	12 (44%)	10-600 ft	10-200 ft	73.2 ft (n = 11)	96.4 ft (n = 11)
Song Sparrow	19	16 (84%)	3 (16%)	30-340 ft	30-100 ft	51.9 ft (n = 13)	80.0 ft (n = 3)
Kingbirds	16	14 (88%)	2 (13%)	15-330 ft	15-330 ft	127.7 ft (n = 14)	157.5 ft (n = 2)
Goldfinches	12	7 (58%)	5 (42%)	25-150 ft	25-150 ft	81.4 ft (n = 7)	85 ft (n = 5)
Northern Mockingbird	11	7 (64%)	4 (36%)	20-200 ft	20-200 ft	72.1 ft (n = 7)	121.3 ft (n = 4)
Mourning Dove	10	2 (20%)	8 (80%)	30-400 ft	30-150 ft	30 ft (n = 2)	86.0 ft (n = 8)
Phoebes	10	8 (80%)	2 (20%)	8-500 ft	8-200 ft	93.3 ft (n = 6)	54 ft (n = 2)

House Finch

The house finch (*Carpodacus mexicanus*) is one of the most tolerant of human activity of all North American birds (Hill 1993). This species frequently nests in association with human dwellings, including construction sites. In 2010, 32 active nests were monitored, mostly at the Zanja Substation near Mentone, but also at and near the El Casco Substation between Redlands and Beaumont and at and near the Kimball Substation in Chino. In most cases a minimum 25-foot buffer zone was established around each nest; however, in some cases this zone was smaller or larger. For example, one nest on the underside of a construction trailer at the El Casco Substation was only 5 feet from the trailer entrance, although shielded from view of workers entering and leaving the trailer. The nest successfully fledged five young. At the other extreme, a nest at the Kimball Substation was found while construction personnel were working next to it. Work ceased in the area until the young fledged; the nearest work thereafter was roughly 400 feet away, the *de facto* buffer zone. In many cases, the 25-foot buffer zone was measured vertically or at an angle between horizontal and vertical. For example, many house finches nested on the steel beams of the Zanja Substation 115kV rack structure 20 to 30 feet overhead. Light work was allowed directly underneath these beams during the period these nests were active.

At Zanja Substation, 21 house finches succeeded in establishing active nests despite ongoing efforts to discourage their nesting in the existing and newly constructed substation infrastructure. Many pairs succeeded in building nests and laying eggs, especially on weekends when biologists were not present to remove nests that were under construction. Of the 32 active nests found overall on the El Casco and Kimball system projects, 21 successfully fledged young, seven failed, and the fate of four was unknown

because monitoring ceased when work in the area was completed. Excluding the latter four nests, the success rate was 75% (Table 1). Although this success rate would appear to correlate favorably with success rates under normal conditions, reliable data on reproductive success rates are not available for this species according to the review by Hill (1993).

When reproductive fate is compared over different buffer zone sizes up to 30 feet in width, the average buffer zone radius for successful nests was 23.2 feet and for unsuccessful nests was 24.2 feet. All three of the nests with a buffer zone radius of less than 15 feet were successful. Monitoring was discontinued at three of the five nests with buffer zones greater than 30 feet in width and the outcomes are not known. Two others, with *de facto* buffer zones of 180 feet and 400 feet, were successful. These were excluded from analysis because the buffer zones were so much wider than the next widest at 30 feet, a comparison would have been meaningless.

American Crow

In 2010, 27 American crow (*Corvus brachyrhynchos*) nests were monitored, all but one of these at or near the Kimball Substation in Chino. Buffer zones established for crow nests varied from effectively zero (no buffer established) to 600 feet, but most were in the range of 40 to 200 feet. Fifteen of 27 nests succeeded in fledging young, including the one with no buffer, and 12 nests failed, for a reproductive success of 56%. For comparison, in one study in British Columbia, 13 of 16 nests (81%) produced at least one fledgling (Campbell et al. 1997), and in Encino, California, of 147 nesting attempts over six years, 63% fledged at least one young (Caffrey 2000). In a study in Illinois by Black (1941), 6 of 11 nests (55%) produced young of banding age (percent fledged was not given).

When reproductive success is compared over different buffer zone widths up to 200 feet in radius (22 nests), the average buffer zone radius for successful nests was 73.2 feet and for the unsuccessful nests was 96.4 feet (Table 1).

Song Sparrow

In 2010 at and near the Kimball Substation, 21 song sparrow (*Melospiza melodia*) nests were monitored. A 30-40-foot buffer zone was established around most nests; although, in some cases this zone was smaller or larger, for example, up to 200 feet in two instances. Two nests 300 and 340 feet from construction were not monitored and thus were not included in the analysis. Sixteen monitored pairs fledged young, three nests failed, and the fate of two others was not known because work was completed in the area while the nest was still active and monitoring ceased. The success rate from the 19 nests with known results was 84%. Although not directly comparable, this rate of success is similar to, if not slightly higher than, the general reproductive success rate recorded in the literature. As would be expected, reproductive success varies markedly between populations and under different environmental and physical conditions. For example, Hochachka et al. (1989) found that on Mandarte Island in British Columbia, 82% of males and 85% of females successfully fledged at least one young in a given year (per nest success rates not given).

When reproductive success is compared over different buffer zone sizes up to 100 feet in radius, the average buffer zone radius for successful nests was 51.9 feet and for the three unsuccessful nests was 80 feet.

Kingbirds

Sixteen Western kingbird (*Tyrannus verticalis*) and five Cassin's kingbird (*Tyrannus vociferans*) nests were monitored and combined into one species group. Of these 12 western and two Cassin's were known to be successful (a success rate of 87.5%) and two failed (both western). Monitoring was

discontinued on five other nests where work had either been completed prior to the end of the nest cycle or was suspended until the nest fate was known. One successful western kingbird nest was not included in the analysis because immediately after it was discovered only 8 feet from a work area, all work was suspended until the nest cycle was completed. The new, *de facto* buffer, if any, was not given.

Most nesting success rates derived from the literature reviewed in Gamble et al. (1996) for western kingbird and Tweit and Tweit (2000) for Cassin's kingbird gave the mean number of fledglings produced per nest attempt but not the number of nests that fledged at least one young. However, Goldberg (1979) found that in central Arizona 17 of 38 Cassin's kingbird nests, or 44.7%, fledged at least one young.

Buffer zones around nests ranged from 15 to 330 feet[4]. The failed nests had buffer zones of 15 and 300 feet (average 157.5 feet), successful nests ranged from 20 feet to 330 feet[2] (average 127.7 feet).

Goldfinches

The three goldfinch species in California all have similar nesting requirements and breeding biology. For this reason, we pooled the data on these species to give us 13 active goldfinch nests for analysis. Of the nests monitored, nine were lesser goldfinch (*Spinus psaltria*) nests, two were Lawrence's goldfinch (*Spinus lawrencei*) nests, and two were American goldfinch (*Spinus tristis*)[5] nests. One American goldfinch was not included in the analysis, as the fate of the nest was unknown; thus the 12 goldfinches had a nesting success rate of 58% (Table 1).

We could find no information in the literature on reproductive success rates for lesser or Lawrence's goldfinches. For American goldfinch, the data are not comparable to the El Casco and Kimball data, but J. Wojnowski (unpubl. data summarized by McGraw and Middleton, 2009) found that 15% of males and 20% of females produced no young in a season.

The average buffer zone for successful nests was 81.4 feet, and for unsuccessful nests, 85 feet (Table 1).

Northern Mockingbird

Twelve northern mockingbird (*Mimus polyglottos*) nests were monitored, but monitoring was suspended on one when work was completed prior to the young fledging, thus its fate was unknown. Seven nests successfully fledged young and four nests did not, for a success rate of 63.6% (Table 1). This compares quite favorably with a general reproductive success rates of 36.4 to 61% from the literature. In a study in southeastern Pennsylvania and Maryland that spanned more than a decade (Derrickson unpubl. data in Derrickson and Breitwisch 1992), 36.4% of nests were successful, and in another study in central Florida (Zaias and Breitwisch 1989), 39.4% of the nesting attempts monitored were successful; however, in both of these studies all active nests were monitored, even those that did not receive eggs. In Illinois 61% of nests were successful (Graber et al. 1970).

Buffer zones established specifically or *de facto* ranged from 20 feet to 200 feet. When reproductive success is compared over different buffer zone widths up to 200 feet, the average buffer zone for the seven successful nests was 72.1 feet and for the four unsuccessful nests was 121.3 feet (Table 1).

Mourning Dove

[4] The low numbers of 15 and 20 feet were vertical buffer zones; the birds nested 15 and 20 feet, respectively, above the work area.

[5] An American goldfinch nest in the El Casco data was a misidentified as lesser; this has been corrected in the analysis.

Thirteen mourning dove nests were monitored in 2010, all at and near the Kimball Substation. Of these, the fate of three was unknown. Among the others, two nests successfully fledged young and eight did not, for a success rate of 20% (Table 1). Studies from the literature showed, that nest success varied annually and spatially across the breeding range of this wide-ranging North American species. In Iowa, McClure (1943) determined that annual success ranged from 37–58%; in Illinois, Hanson and Kossack (1963) found a 52–87% success rate; and in California, Miller et al. (2001) found only a 30–41% nest success rate. Sayre and Silvey (1993) reported an average nest success of 48% across the entire range of the species.

In the El Casco and Kimball study data, the buffer zone for both of the two successful nests was 30 feet; for the eight that failed, the average buffer zone was 86 feet (Table 1).

Phoebes

As with the goldfinches, nest data were pooled for phoebes, even though only one Say's phoebe (*Sayornis saya*) nest was monitored. Of the nine black phoebe (*Sayornis nigricans*) nests, eight were successful and one failed, as did the Say's phoebe nest, resulting in a success rate for phoebes of 80% (Table 1).

In Santa Barbara County, Schroeder (1985) found that 73% of 745 black phoebe nests he studied fledged at least one young. In Santa Clara County, Wolf (1951) found a successful fledging rate of 59% from 25 nests, and in Trans-Pecos, Texas, Ohlendorf (1976) had a successful fledging rate of 71% from 21 nests. For Say's Phoebe, J. Shuckman (unpubl. data cited in Shuckman and Wolf 1998) found overall nest success (percentage of pairs fledging at least one young/season) was 53.3%. The El Casco/Kimball data set is small and not conducive to statistically significant analysis, but the success rate from this small sample was higher than in any of these more extensive studies.

Buffer zones for successful phoebe nests at El Casco and Kimball averaged 93.3 feet and for the two failed attempts averaged 54 feet (Table 1).

Other Species

For the other twenty species monitored, too little data are available for meaningful analysis. Among raptors, both Cooper's hawks (*Accipiter cooperii*) successfully fledged young and four of five red-tailed hawks successfully raised young; however, the one great horned owl (*Bubo virginianus*) nest failed when high winds blew the chick out of the nest and it was eaten by a coyote. One very aggressive Cooper's hawk pair successfully fledged four chicks from a nest on the edge of a golf fairway, and a very tolerant pair successfully fledged three chicks from a well concealed nest on the backside of a eucalyptus grove by the El Casco Substation access road. In both cases, construction activities were light and for brief periods.

<u>Assignment of Minimum Allowable Buffer Zones for These and Other Species</u>

Minimum allowable buffers for more than 120 species potentially nesting in the TRTP area, grouped into 21 categories, are given in Table 2-1and Attachment B of the TRTP Segments 4–11 Draft Nesting Bird Management Plan are the collective effort of the two authors who, together, have nearly 100 combined years of experience studying birds and most aspects of their biology and behavior. Bloom is an internationally recognized expert on most aspects of raptor breeding biology and also has an intimate knowledge of a number of other species such as the pigeons and doves, greater roadrunner, swifts, ravens, and crows. He also has broad experience with most of the other species. Jones has studied songbirds and near songbirds such as woodpeckers and hummingbirds since childhood. Together, Bloom and Jones have banded more than 25,000 nestlings of about 60 species and have monitored

activities at nests of an additional 30-40 species. Both Jones and Bloom have had extensive experience as avian nest monitors, including, for Jones, the El Casco System project in 2010.

Because there is nothing substantial in the published literature on establishment of effective buffer zones around active nests, Bloom and Jones have drawn heavily on their own professional experience to formulate the recommended minimum allowable buffers given for more than 120 species that have the potential to breed in the TRTP area (Table 2-1 of the Nesting Bird Management Plan). For convenience, these species have, where possible, been placed in 21 groups with species sharing similar nesting environments and/or similar levels of response to human intrusion.

Waterfowl

Only two species are likely to nest within the TRTP area, mallard and American coot. Both build nests that are concealed from view by emergent vegetation, and incubating birds rely on their concealment to protect them and their nest from encroachment. A 100-foot horizontal buffer zone under most circumstances should be adequate to assure that most construction-related activities do not contribute to nest failure. For helicopter work, however, this buffer zone is increased to 300 feet horizontally and 150 feet vertically, primarily to avoid damage to the nest from rotor wash (15 to 18 mph at 75 to 150 feet).

Recommended minimum horizontal buffer for ground construction: 100 ft.
Recommended minimum horizontal buffer for helicopter construction: 300 ft.
Recommended minimum vertical buffer for helicopter construction: 150 ft.

Quail

Two species of quail, mountain and California, nest within the TRTP area, but the former is restricted to Segment 6. Like waterfowl, quail have well concealed nests and they are often more sensitive to human disturbance potentially because they do not have the added security provided by water, an effective barrier to most types of intrusion. Conversely, quail may be less sensitive to overhead helicopter activity, as long as it is brief.

Recommended minimum horizontal buffer for ground construction: 75 ft.
Recommended minimum horizontal buffer for helicopter construction: 200 ft.
Recommended minimum vertical buffer for helicopter construction: 150 ft.

Herons

Herons are colonial nesters. As demonstrated by Rodgers and Smith (1995), Tremblay and Ellison (1979), and others, colonial nesters are more sensitive to disturbance than non-colonial nesters. This is likely due to at least two characteristics of colonial species, they are more conspicuous to predators, and when the most sensitive individual in colony flushes the rest usually follow suit. The disruption not only causes the potential failure of one nest, but of all nests in the colony. The recommended allowable buffers have been expanded accordingly for all three categories. It should be noted that heron colonies have been intensively studied and the young banded at many locations throughout North America and Europe. When the climbing and banding bouts are brief, reproductive success has not been dramatically affected (Bloom professional experience). In southern California, Bloom banded more than 500 black-crowned night-herons at one colony in one season, and the colony was equally active the following year where nest trees remained. Similarly, Bloom has banded approximately 100 young great blue herons at other colonies in both northern and southern California and noted no reduction in the number of active nests in the following year, nor any abnormal loss in productivity at the nests that were entered. This suggests that human disturbances that are short in duration are acceptable even though very direct and briefly intense.

Recommended minimum horizontal buffer for ground construction: 150–200 ft.

Recommended minimum horizontal buffer for helicopter construction: 500 ft.
Recommended minimum vertical buffer for helicopter construction: 300 ft.

Birds of Prey: Category 1

Category 1 has the species that are least susceptible to disturbance at the nest. These include the cavity nesters American kestrel, barn owl, western screech-owl, and northern pygmy-owl. Like other cavity nesters, brooding raptors in this category are not likely to flush until their cavity tree or other substrate is physically disturbed. All but the kestrel are nocturnal and would not be active during hours that construction activity would be taking place. The non-brooding member of a kestrel pair; however, may become agitated by the close approach of a human on foot, but likely not by humans in vehicles and other equipment, as these are not generally seen as a direct threat to the nest.

Recommended minimum horizontal buffer for ground construction: 100 ft.
Recommended minimum horizontal buffer for helicopter construction: 200 ft.
Recommended minimum vertical buffer for helicopter construction: 150 ft.

Birds of Prey: Category 2

Category 2 consists of birds that frequently nest in or near urban environments. Urban-nesting birds are more accustomed to human activity in the vicinity of their nest than are pairs of the same species that nest in more remote areas. But because they are open nesters, their nests are more vulnerable to destruction by humans and other large mammals. While there is a great deal of variation between individual pairs as to their susceptibility to disturbance, even among those accustomed to nesting in areas with moderate human activity, most are not affected by light activity nearby as long as it is not perceived as threatening. The recommended minimum buffers are supported by the El Casco and Kimball project data analyzed in this report. A Cooper's hawk nest 130 feet from sub-transmission tower replacement activity and even closer to golfers on an adjacent golf course successfully fledged three chicks. A great horned owl nest 90 feet from the El Casco Substation access road that was routinely carrying heavy construction equipment during the period the nest was active failed because high winds blew the chick out of the nest, not because of construction-related activity.

Recommended minimum horizontal buffer for ground construction: 150 ft.
Recommended minimum horizontal buffer for helicopter construction: 200–300 ft.
Recommended minimum vertical buffer for helicopter construction: 200 ft.

Birds of Prey: Category 3

The most sensitive raptor species are in Category 3. This category includes red-tailed hawk, which is also a Category 2 species, because red-tailed hawks in areas with low human disturbance can be much more sensitive to human activity near the nest than those living in more urban environments. For these individuals, minimum buffer zones start at 300 feet and may increase to 500 feet and beyond, depending on the circumstances and the pair's sensitivity to humans. We see no need however to establish a minimum allowable buffer of greater than 300 vertical feet for most helicopter activity as long as the period of activity is brief.

Recommended minimum horizontal buffer for ground construction: 300–500 ft.
Recommended minimum horizontal buffer for helicopter construction: 300–500 ft.
Recommended minimum vertical buffer for helicopter construction: 300 ft.

Shorebirds

Only three species of shorebirds are likely to nest within the TRTP area: killdeer, black-necked stilt, and American avocet. In 2010, all seven black-necked stilt nests and one American avocet nest near the Kimball substation successfully fledged young. *De facto* buffer zones from work activity ranged from 280

to more than 300 feet. These birds nested across Kimball Avenue, a high-volume traffic arterial road, from the substation construction activity. They were not disturbed by the traffic, to which they were undoubtedly accustomed, and would not likely have been disturbed by light construction activity at even closer range, to which they should quickly acclimate. Killdeer are generally more tolerant of nearby human activity than stilts and avocets, largely because their eggs are well camouflaged. Killdeer also readily engaging in a broken-wing display behavior when intruders approach too close to their nest. Any activity that would elicit such a display would constitute sufficient reason to expand the minimum acceptable buffer. Although four of seven active killdeer nests near the Kimball Substation in 2010 failed, none of the failures were the result of construction-related impacts. One failed because a contractor on another project removed the gravel pile that contained the nest. Two nests failed prior to the commencement of SCE work , and the fourth failed despite being across the highway and 200 feet from SCE work. Of the three nests that successfully fledged young, one was only 70 feet from construction activity and another was 180 feet away.

Recommended minimum horizontal buffer for ground construction: 125–150 ft.
Recommended minimum horizontal buffer for helicopter construction: 300 ft.
Recommended minimum vertical buffer for helicopter construction: 200 ft.

Pigeons

Band-tailed pigeon is the only native pigeon that occurs within the TRTP area. Band-tailed pigeons are relatively sensitive to disturbance, so have been assigned a recommended minimum allowable buffer of 100 feet. Because their nests are flimsy and their contents could be blown out of the nest by rotor wash, 200-foot horizontal and vertical buffers have been designated for brief helicopter activity.

Recommended minimum horizontal buffer for ground construction: 100 ft.
Recommended minimum horizontal buffer for helicopter construction: 200 ft.
Recommended minimum vertical buffer for helicopter construction: 200 ft.

Doves

The only naturally occurring dove in the TRTP area is mourning dove. Mourning doves are more tolerant of human activity than band-tailed pigeons and thus can tolerate a significantly smaller ground-based horizontal buffer and vertical helicopter buffer. We have maintained the 200-foot horizontal helicopter buffer, however, because of the minimal risk of horizontal rotor wash spilling the nest contents.

Recommended minimum horizontal buffer for ground construction: 25–50 ft.
Recommended minimum horizontal buffer for helicopter construction: 200 ft.
Recommended minimum vertical buffer for helicopter construction: 100 ft.

Roadrunners

Although roadrunners conceal their ground nests well, they are more generally sensitive to human disturbance than most passerines and doves. Because roadrunners consume large numbers of arthropods, reptiles and nestling birds, they also require a relatively large area for foraging and cannot tolerate habitat disturbance within roughly 300 feet of their nest if they are to provide adequate amounts of food to their young.

Recommended minimum horizontal buffer for ground construction: 100 ft.
Recommended minimum horizontal buffer for helicopter construction: 200 ft.
Recommended minimum vertical buffer for helicopter construction: 150 ft.

Caprimulgidae

Although nocturnal, and likely less susceptible to daytime disturbance than roadrunners, caprimulgids (lesser nighthawk and common poorwill in the TRTP area) build nests on the ground that are typically

exposed, relying instead on camouflage for protection. We considered caprimulgids to have roughly the same sensitivity to disturbance as roadrunners, but less sensitivity than killdeer, which nest in similar situations but are diurnal (active during periods of construction).

Recommended minimum horizontal buffer for ground construction: 100 ft.
Recommended minimum horizontal buffer for helicopter construction: 200 ft.
Recommended minimum vertical buffer for helicopter construction: 150 ft.

Swifts

White-throated swift is the only swift in the TRTP area. It nests in crevices and other cracks and cavities well protected from outside disturbance. Incubating birds seldom flush unless their nest crevice is penetrated. Their nests are also not susceptible to rotor wash from overhead helicopters, thus we have assigned them near minimum buffer zones.

Recommended minimum horizontal buffer for ground construction: 50 ft.
Recommended minimum horizontal buffer for helicopter construction: 50 ft.
Recommended minimum vertical buffer for helicopter construction: 50 ft.

Hummingbirds

Hummingbirds are among the most tolerant of human disturbance with brooding females typically not flushing until one approaches within a few feet of the nest. The greatest threat to hummingbird nest contents is likely to be rotor wash from nearby helicopters, especially horizontal rotor wash, so the minimum allowable horizontal buffer zone for helicopter work is set at 200 feet. Otherwise, a minimum vertical distance of 75 feet from helicopter work and 25 feet horizontal distance for most other work should be adequate to prevent nest failure.

Recommended minimum horizontal buffer for ground construction: 25 ft.
Recommended minimum horizontal buffer for helicopter construction: 200 ft.
Recommended minimum vertical buffer for helicopter construction: 75 ft.

Woodpeckers

Woodpeckers, like other cavity nesters, do not require a large buffer from light construction activity or from brief periods of helicopter work. In most instances, a 25-foot horizontal buffer from light ground-based work, 50 feet from brief helicopter work, and 100 vertical feet from overhead helicopter work should be adequate.

Recommended minimum horizontal buffer for ground construction: 25 ft.
Recommended minimum horizontal buffer for helicopter construction: 100 ft.
Recommended minimum vertical buffer for helicopter construction: 50 ft.

Passerines: Cavity and Crevice Nesters

We have assigned the same buffer categories to cavity-nesting passerines as we have for woodpeckers, as their nesting environment is similar.

Recommended minimum horizontal buffer for ground construction: 25 ft.
Recommended minimum horizontal buffer for helicopter construction: 100 ft.
Recommended minimum vertical buffer for helicopter construction: 50 ft.

Passerines: Bridge, Culvert, and Building Nesters

Species that nest under bridges, in culverts, or on buildings have nests that are slightly to much more exposed than are cavity nests. Most of these species are acclimated to human activity and are thus more tolerant of disturbance. While minimum horizontal buffers of 25 feet may be tolerated by species such

as house finch, house wren, and northern rough-winged swallow (a lateral burrow or cavity nester), a larger buffer may be necessary for phoebes, barn swallows, and cliff swallows, species that typically build more exposed nests. Overhead helicopter activity may be more disruptive to birds in this category than to cavity nesters, so a larger vertical buffer is recommended.

Recommended minimum horizontal buffer for ground construction: 25–50 ft.
Recommended minimum horizontal buffer for helicopter construction: 100 ft.
Recommended minimum vertical buffer for helicopter construction: 75 ft.

Passerines: Ground Nesters, Open Habitats

Passerines that nest on the ground in open areas generally have well hidden nests in or under clumps of grass, other vegetation, or litter, and the brooding birds are often more sensitive to nearby human activity than are birds that may have less concealed nests in thickets where intrusion is hindered by the surrounding vegetation. For example, a western meadowlark nest may be much more difficult to find than that of a towhee, but the incubating adult may be more exposed to the perceived predation threat of humans. For this reason, ground nesters in open habitats are given the greatest horizontal buffers of all the passerine groups.

Recommended minimum horizontal buffer for ground construction: 100 ft.
Recommended minimum horizontal buffer for helicopter construction: 200 ft.
Recommended minimum vertical buffer for helicopter construction: 150 ft.

Passerines: Understory and Thicket Nesters

For the reasons mentioned above, understory and thicket nesters tolerate a smaller buffer zone than open ground nesters, although the vertical buffer separating their nests from overhead helicopters is the same as for all other passerines except for cavity, bridge, culvert, and building nesters.

Recommended minimum horizontal buffer for ground construction: 25 ft.
Recommended minimum horizontal buffer for helicopter construction: 200 ft.
Recommended minimum vertical buffer for helicopter construction: 75 ft.

Passerines: Shrub and Tree Nesters

Passerines that place their nests in shrubs and trees are generally more wary of nearby human activity than are those that nest in thickets because their nests are more exposed. Their nests are also more vulnerable to rotor wash from helicopters hovering nearby. A few species in this category are more tolerant of humans than others (for example, western kingbird and northern mockingbird), and these may tolerate smaller horizontal buffers than the range of 75 to 100 feet given in the table.

Recommended minimum horizontal buffer for ground construction: 75–100 ft.
Recommended minimum horizontal buffer for helicopter construction: 200 ft.
Recommended minimum vertical buffer for helicopter construction: 150 ft.

Passerines: Tower Nesters

Tower nesters do not typically require a large horizontal buffer because their nests are often high up on these structures, effectively giving them a much larger buffer zone. For example, a 25-foot horizontal buffer alone would not be sufficient for a raven, even one acclimated to humans. But combined with the 100- to 200-foot vertical buffer provided by the tower, some ravens will tolerate a 25-foot horizontal buffer from the base of the tower. Other ravens may require a much larger horizontal buffer, and these should be evaluated on a case-by-case basis.

Recommended minimum horizontal buffer for ground construction: 25 ft.
Recommended minimum horizontal buffer for helicopter construction: 200 ft.
Recommended minimum vertical buffer for helicopter construction: 100–300 ft.

Passerines: Marsh Nesters

Marsh-nesting passerines are especially tolerant of nearby human activity, even those that nest colonially, because their nests are well hidden in dense, nearly impenetrable emergent vegetation. Also, their nests are over water, which provides another deterrent to predators, including the perceived predation threat from humans.

Recommended minimum horizontal buffer for ground construction: 25 ft.
Recommended minimum horizontal buffer for helicopter construction: 200 ft.
Recommended minimum vertical buffer for helicopter construction: 75–150 ft.

CONCLUSION

It should be emphasized that these recommended buffers are the minimal ones allowable. In some, perhaps many, cases, the buffer size may need to be increased soon after the nest is discovered, even beforehand if the birds become especially agitated during the nest discovery phase. Our recommendations are also tentative. Although we have had extensive experience with some species, our knowledge of the tolerance levels of others is less extensive. We have attempted to extrapolate our experience with a wide variety of species to other, less familiar species with similar behavioral traits and nest environments. Monitoring of nesting behavior and nest status by qualified avian specialists will track the effectiveness of the recommended minimal buffers. Adjustments to these recommended buffers may be made upon further coordination with CDFG to account for relevant information from ongoing monitoring events.

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APPENDIX F

Riparian Habitat Enhancement Plan

RIPARIAN HABITAT ENHANCEMENT PLAN

CROSS VALLEY LINE

SOUTHERN CALIFORNIA EDISON
TULARE COUNTY, CALIFORNIA

June 2013

Quad Knopf

Riparian Habitat Enhancement Plan for the Cross Valley Line

Tulare County, California

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1.0 INTRODUCTION

1.1 General Overview

This Habitat Enhancement Plan (Plan) addresses the restoration and mitigation requirements associated with impacts to riparian species along Southern California Edison's (SCE) Cross Valley Line. SCE plans to string new wire above the St. John's River and Cottonwood Creek riparian corridors as part of the installation of the Cross Valley Line. These corridors provide habitat for special status riparian bird species including the federal-Endangered least Bell's vireo (*Vireo bellii pusillus*), the federal-Endangered southwestern willow flycatcher (*Empidonax traillii extimus*), and the little willow flycatcher (*Empidonax traillii brewsteri*), which is a federal Species of Special Concern. Focused surveys for these species were conducted in accordance with standardized protocols during the 2011 and 2012 breeding seasons. There were two observations of the willow flycatcher during the 2011 breeding season and three observations of the willow flycatchers during the 2012 breeding season along the St. John's River (Quad Knopf 2012a). All of these observations were considered to be of transient individuals or migrants because they exhibited no nesting or breeding behavior.

Given that the federally protected least Bell's vireo, southwestern willow flycatcher, little willow flycatcher could potentially be present within the St. John's River and Cottonwood Creek riparian corridors at the time of the Cross Valley Line (Project) implementation, SCE is applying for an Incidental Take Permit (ITP) from the U.S. Fish and Wildlife Service (USFWS) pursuant to Section 10(a)(1)(B) of the Endangered Species Act (ESA) for the incidental take of these three riparian bird species. The ESA defines *take* as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." Federal regulation 50 CFR 17.3 further defines the term *harass* in the definition of "take" in the ESA to include an intentional or negligent act or omission that creates the likelihood of injury to wildlife by annoying it to significantly disrupt normal behavioral patterns, which include but are not limited to breeding, feeding, or sheltering. Although construction, operation, and maintenance of the Cross Valley Line will not directly impact riparian habitat, the project could result in incidental take of these riparian bird species through indirect impacts such as harassment. Project activities could produce noise, vibrations, and other disturbances at levels that could significantly disrupt their normal behavioral patterns. The riparian habitat enhancement efforts described in this Plan are being proposed to mitigate these potential impacts.

Direct impacts to the riparian habitat at St. John's River near the Cross Valley Line will be caused by another related project, the Big Creek 1-Rector and Big Creek 3-Rector Rebuild (Big Creek Rebuild). Direct impacts by the Big Creek Rebuild Project are being addressed through a separate Riparian Habitat Restoration Plan (Quad Knopf 2013a). Given the close proximity between the Big Creek Rebuild and Cross Valley Line Projects at the St. John's River, implementing restoration and enhancement strategies for these projects that are complementary to one another is appropriate. The Cross Valley Line enhancement efforts proposed in this Plan are an expansion of the efforts that have already been developed for the Big Creek Rebuild Project.

1.2 Project Description

SCE is conducting a rebuild of an existing transmission line (Big Creek Rebuild) and developing a new transmission line (Cross Valley Line). These projects are within an existing Right-of-Way (ROW) where the lines cross the St. John's River. The Cross Valley Line Project is located northeast of the City of Visalia, in northwestern Tulare County, California (Figure 1). The Cross Valley Loop Project originates just south of the Rector Substation located near the east perimeter of the City of Visalia and extends north and east to the existing Big Creek 3-Springville 220 kV transmission line.

1.2.1 CROSS VALLEY LINE

The Cross Valley Line consists of the construction of a new approximately 23 mile double-circuit 220 kV transmission line that would loop the existing Big Creek 3-Springville 220 kV transmission line into the 220 kV Rector Substation creating the new Big Creek 3-Rector No. 2 and Rector-Springville 220 kV transmission line circuits (Figure 2). Approximately 10.8 miles of the total 23 mile loop will be constructed in the eastern half of the existing north-south SCE corridor; and the remaining 12.2 miles will be constructed in a new east-west SCE ROW. In order for the new Cross Valley Line to tap into the Big Creek 3-Springville 220kV transmission line, structures immediately north and south of the tap in site will need to be demolished and rebuilt. This component also includes the installation of optical ground wire (OPGW) for telecommunication, modification to existing access roads, and construction of new access roads.

For the purposes of this Plan, the specific proposed activity taking place at St. John's River and Cottowood Creek along the Cross Valley Line involves installation of a new overhead transmission line across these respective riparian corridors. None of the Project activities will directly impact riparian habitat at either location. At the St. John's River, tubular steel poles (TSPs) will be installed 490 feet north and 207 feet south of the riparian habitat within the SCE ROW (Figure 3). A temporary guard structure will also be installed approximately 256 feet north of the riparian habitat. The guard structure will ensure that the transmission line will remain outside the riparian vegetation and the streambed during wire stringing activities. Typical guard structures are composed of 60- to 80- foot tall wood poles with 3- to 4-foot diameter and 6- to 10-foot deep foundations. Holes for guard structure foundations will be dug using a back-hoe or truck-mounted augur. Guard structures will be delivered to the site on flat-bed trucks and will be moved in place using a wheeled or tracked crane. Paved or compact access roads currently exist to facilitate delivery of the guard structures. One of the access roads approaches to within 30 feet of the riparian habitat along the north bank of the St. John's River. Once conductors and optical ground wires (OPGW) have been strung, the guard structures will be removed by crane and foundation holes will be refilled by backhoe. The total area encompassed by the two clear areas associated with the TSPs is 0.76 acre, and the total area encompassed by the temporary guard structure is 0.17 acre.

At Cottonwood Creek, TSPs will be installed 300 feet to the west and 450 feet to the east of the riparian habitat within the SCE ROW (Figure 4). Temporary guard structures will also be installed to both the west and east of the creek crossing in a manner that ensures that the transmission line will remain outside the riparian vegetation and the streambed during wire stringing activities. The guard structures will be located approximately 75 feet west and 25 feet

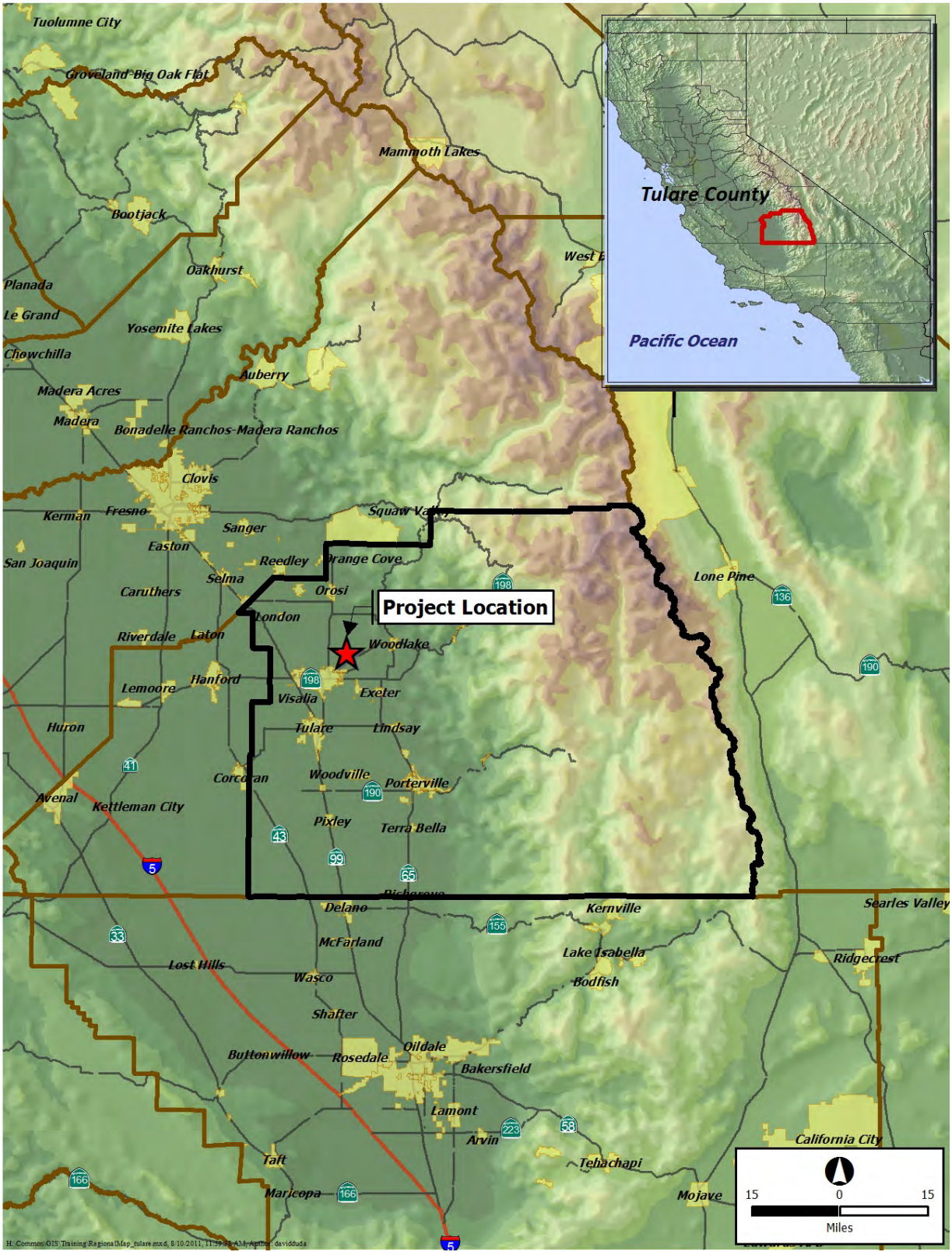
east of the riparian habitat. As with the TSP installation at the St. John's River, holes for guard structure foundations will be dug using a back-hoe or truck-mounted augur. Guard structures will be delivered to the site on flat-bed trucks and will be moved in place using a wheeled or tracked crane. Paved or compact access roads currently exist to facilitate delivery of the guard structures. Once conductors and optical ground wires (OPGW) have been strung, the guard structures will be removed by crane and foundation holes will be refilled by backhoe. The total area encompassed by the two clear areas associated with the TSPs is 0.51 acre, and the total area encompassed by the temporary guard structure is 0.53 acre.

In summary, Project activities do not include any ground disturbance within the riparian habitats at either the St. John's River or Cottonwood Creek. No significant ground disturbance will occur within the jurisdictional boundaries of the streambed, nor are any significant disturbances to the riparian habitats anticipated. The closest ground disturbance activities to the St. John's River would be approximately 207 feet and the closest ground disturbing activities to the Cottonwood Creek would be 25 feet away.

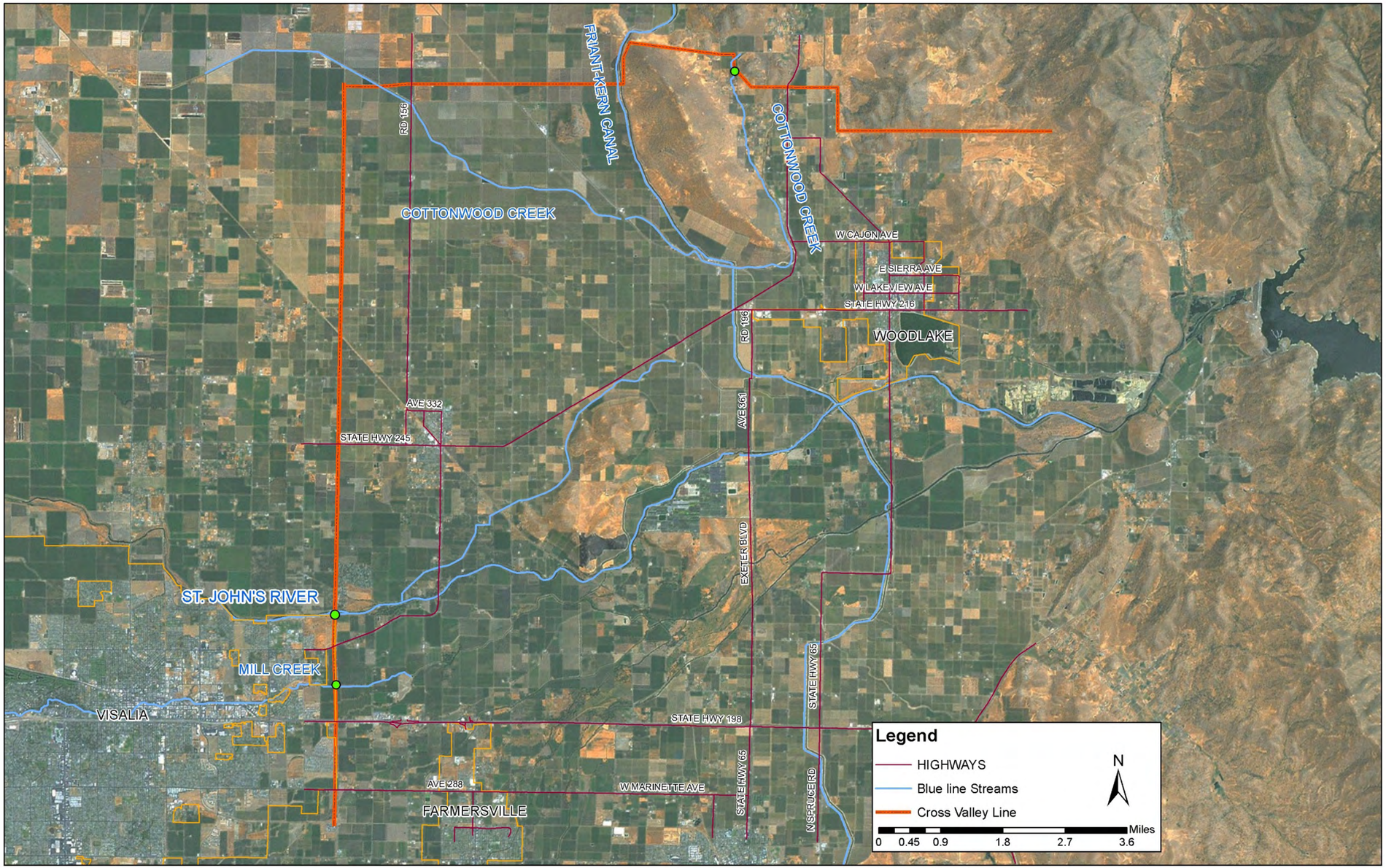
1.2.2 BIG CREEK REBUILD

The Big Creek Rebuild Project consists of dismantling two parallel single circuit 220 kV (Big Creek 1-Rector 220 kV and Big Creek 3-Rector 220kV) transmission line segments composed of lattice steel towers in order to consolidate them into one double circuit 220 kV transmission line circuit primarily composed of tubular steel poles (TSPs) and a few lattice steel towers (LSTs) in the western half of the existing 11.3 mile 150-foot north-south SCE ROW (described above for the Cross Valley Line) to an area just south of the Rector Substation. This component also includes modifications to structures immediately south of Rector Substation, installation of optical ground wire (OPGW) for telecommunication, modifications to existing access roads, construction of new access roads, construction of laydown yards, modifications to the Rector Substation and removal of wave traps and line tuners and installation of protective relays at the Rector, Springville, Vestal, and Big Creek 3 Substations. The objective of this component is to consolidate two existing transmission lines into a single double circuit line along the western half of the existing north-south corridor.

Activities at St. John's River that are associated with the Big Creek Rebuilt include repair and utilization of an existing access road that crosses the river, and dismantling and removal of two LSTs and associated foundations from the island within the St. John's River. The proposed impact area will consist of a demolition site approximately 200 feet by 150 feet around the LSTs. Activities will be concentrated within 20 feet of the LSTs. The Big Creek Rebuild project does not cross Cottonwood Creek. The Big Creek Rebuild Project activities and impacts are provided in a separate document, the Riparian Habitat Restoration Plan, Southern California Edison, Big Creek Rebuild Project, Tulare County, California (Quad Knopf 2013a). The information on the Big Creek rebuild project is only provided in this document because it is important to understand that the restoration enhancements associated with the Cross Valley Line are complementary to planned restoration activities associated with the Big Creek rebuild Project.



Quad Knopf	REGIONAL LOCATION OF THE CROSS VALLEY LINE, TULARE COUNTY, CALIFORNIA	Figure 1



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LOCAL AREA OF THE CROSS VALLEY LINE, TULARE COUNTY, CALIFORNIA

Figure 2

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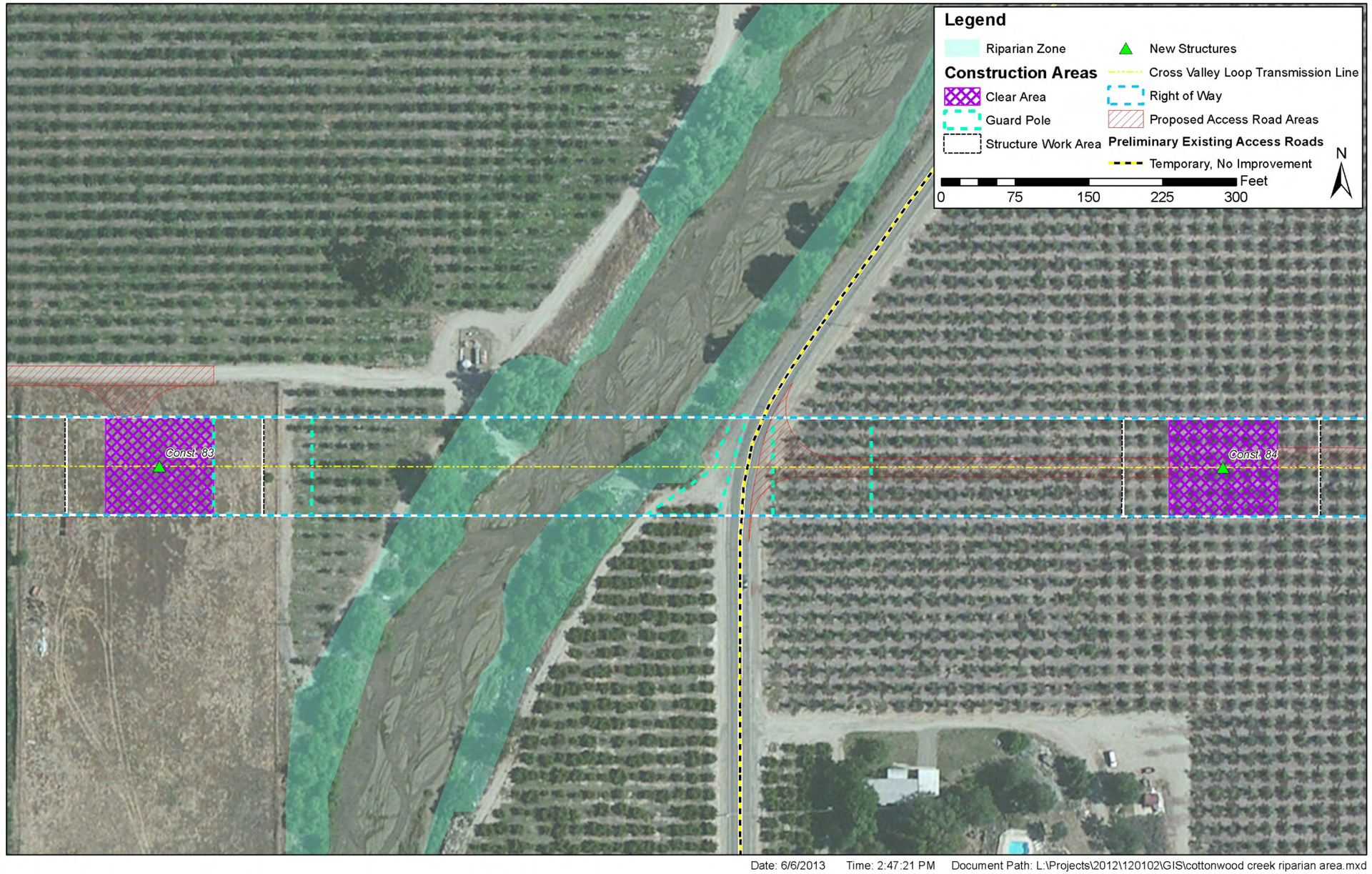
Quad Knopf

CROSS VALLEY LINE AT ST. JOHN'S RIVER, TULARE COUNTY, CALIFORNIA

Figure 3



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Quad Knopf

CROSS VALLEY LINE AT COTTONWOOD CREEK, TULARE COUNTY, CALIFORNIA

Figure 4

1.3 Regulatory Background

Section 10(a) of the ESA establishes a process for obtaining an ITP, which authorizes non-federal entities to incidentally take federally listed wildlife or fish subject to certain conditions. Incidental take is defined by the ESA as take that is "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." Preparation of a conservation plan, generally referred to as a Habitat Conservation Plan (HCP), is required for all Section 10(a)(1)(B) permit applications. The USFWS and the National Marine Fisheries Service (NMFS) have joint authority under the ESA for administering the incidental take program. The riparian bird species addressed in this Plan are exclusively within the jurisdiction of the USFWS. The regulatory standard under Section 10(a)(1)(B) of the ESA is that the effects of authorized incidental take must be minimized and mitigated to the maximum extent practicable, that the effects of the authorized incidental take also will not appreciably reduce the likelihood of the survival and recovery of the species in the wild, and that adequate funding for a plan must be ensured. The riparian habitat enhancement efforts proposed in this Plan will effectively mitigate any potential indirect impacts to the federally protected least Bell's vireo, southwestern willow flycatcher, and little willow flycatcher

2.0 PROJECT SETTING

2.1 Geographic Area

The Cross Valley Line is located in Tulare County, which encompasses 4,863 square miles near the center of California. Tulare County is bordered by Kings County to the west, Kern County to the south, Fresno County to the north, and Inyo County to the east. The County Seat, Visalia, is situated approximately 43 miles from Fresno, 189 miles from Los Angeles, and 228 miles from San Francisco.

Tulare County, which has an elevation range of 488 to 14,448 feet above mean sea level (AMSL), extends from the western San Joaquin Valley eastward to the high Sierra Nevada, and encompasses portions of the San Joaquin Valley, southern Sierra Nevada Foothills, and southern High Sierra Nevada Subregions within the California Floristic Province. The project is generally located within the ecotone between the San Joaquin Valley and southern Sierra Nevada Foothills Subregions. The project is located on portions of the following United States Geological Survey (USGS) 7.5 minute topographic quadrangles: Exeter, Ivanhoe, and Woodlake. This area was historically dominated by Oak Woodland and California Prairie vegetation associations that have undergone extensive agricultural conversion since the mid-1800's.

2.2 Topography and Soils

The area traversed by the Cross Valley Line between the Rector Substation and the Friant-Kern Canal (approximately mile 0 to mile 15 of the transmission line route) is characterized by intensive agricultural and residential development with little topographic relief. East of the Friant-Kern Canal (from approximately mile 15 to mile 23), the transmission line traverses an area consisting of active rangeland in hummocky and rolling terrain consistent with southern Sierra Nevada Foothill topography.

Sixteen soil types occur along the transmission line corridor (USDA 1982). The seven soil types occurring along the north-south trajectory of the transmission line corridor (approximately mile 0 to mile 11) are primarily sandy loam or loam soils. In order from north to south, these soils are as follows:

- Nord Fine Sandy Loam (0 to 2 percent slope);
- Grangeville Sandy Loam (drained, 0 to 2 percent slope);
- Tagus Loam (0 to 2 percent slope);
- Exeter Loam (0 to 2 percent slope);
- San Joaquin Loam (0 to 2 percent slope);
- Yettem Sandy Loam (0 to 2 percent slope); and
- Quonal-Lewis Associated soils (0 to 2 percent slope).

The nine soil types occurring along the east-west trajectory of the transmission line corridor (approximately mile 11 to mile 23) are primarily silts, clays, loams, and rocky outcrops. In order from east to west, these soils are as follows:

- Grangeville Silt Loam (drained);
- Porterville Clay (0 to 2 percent slope);
- Cibo-Rock Outcrop Complex (15 to 50 percent slope);
- Exeter Loam (2 to 9 percent slope);
- Cieneba-rock Outcrop Complex (15 to 75 percent slope);
- San Joaquin Loam (2 to 9 percent slope and 0 to 2 percent slope);
- San Emigdio Loam;
- Blasingame Sandy Loam (15 to 30 percent slope); and
- Yettem Sandy Loam (0 to 2 percent slope).

2.3 Biological Conditions

2.3.1 ST. JOHN'S RIVER

Vegetation Communities

The Cross Valley Line area does cross some native Great Valley Mixed Riparian Forest (Holland Code #61420) and Great Valley Valley Oak Riparian Forest (Holland Code #61430) communities (Holland 1986) along the St. John's River. Species present along the St. John's River are Valley oak (*Quercus lobata*), arroyo willow (*Salix lasiolepis*), black willow (*S. goodingii*), common buttonbush (*Cephalanthus occidentalis*), California sycamore (*Plantanus racemosa*), and Oregon ash (*Fraxinus latifolia*). Understory species include rush (*Juncus balticus*), seep monkey flower (*Mimulus guttatus*), spikerush (*Heleocharis acicularis*), California blackberry (*Rubus ursinus*), elderberry (*Sambucus* spp.), California grape (*Vitis californica*), and stinging nettle (*Urtica dioica holosericea).* The riparian forest occurring along the St. John's River has been degraded by bank clearing, which has significantly reduced the vigor and reproductive output of the dominant plant species. Furthermore, the riparian habitat is fragmented from its native range and has lost the majority of its connectivity to adjoining

riparian habitat. Despite its lack of connectivity, the St John's River island and adjacent north and south banks do provide local habitat for riparian vegetation and wildlife species to forage and find cover, even though there is a high level of disturbance to these banks from recreationalists.

Wildlife Species

Wildlife species present in riparian habitat include a wide variety of vertebrates and invertebrates as well as several species that are only found in riparian habitats. Willow flycatchers have been observed along the St. John's River in the vicinity of the proposed activity site (Quad Knopf 2012b). As indicated above, the southwestern willow flycatcher is federally-Endangered, and the little willow flycatcher is only a federal Species of Special Concern. Because the two locally overlapping subspecies are very difficult to distinguish, agencies recommend that any willow flycatcher detected in the area of the proposed activity be considered the southwestern subspecies and that standard avoidance and mitigation measures be taken. No nesting or nesting behavior of willow flycatchers has been observed in the vicinity of the proposed activity site. The southwestern willow flycatcher is generally not considered to occur in Tulare County (USFWS 2013), but that does not refute the possibility of the species appearing in an unexpected location. The proposed project area is within the expected range of the southwestern willow flycatcher and the species has been observed during biological surveys, however, the lack of observed nesting or courting behavior indicates the observed individuals were transients or migrants. The timing of the proposed activity (October 2013) falls outside of the annual migration period for the southwestern willow flycatcher and so no direct impacts to this species are anticipated, but indirect impacts could potentially occur.

2.3.2 COTTONWOOD CREEK

Vegetation Communities

The Cross Valley Line area does cross some native Great Valley Mixed Riparian Forest (Holland Code #61420) community (Holland 1986) along Cottonwood Creek, but it is impacted by recreational vehicle use through the streambed. Cottonwood Creek is an intermittent creek that flows only during and after periods of winter and spring rains. Historically, Cottonwood Creek flowed into the Kaweah River, but it has since been diverted and channelized for local agricultural use. Species present along Cottonwood Creek are Valley oak, interior live oak (*Quercus wislizeni*), Cottonwood (*Populus fremontii*), arroyo willow, red willow (*Salix laevigata*), tamarisk (*Tamarix parviflora*), elderberry, and California grape. The riparian forest occurring along Cottonwood Creek has been degraded by bank clearing and erosion, which has significantly reduced the vigor and reproductive output of the dominant plant species. Furthermore, the riparian habitat is fragmented from its native range and has lost the majority of its connectivity to adjoining riparian habitat. Despite its lack of connectivity, Cottonwood Creek does support riparian vegetation that provides habitat for wildlife species to forage and find cover.

No sensitive or special status species or their sign have been observed in the vicinity of the proposed activity sites at Cottonwood Creek. Focused surveys were conducted for the least Bell's vireo, southwestern willow flycatcher, and little willow flycatcher in 2011 and 2012. None of these three species were detected in the vicinity of the project site at Cottonwood Creek. During the surveys conducted for special status species, thirty-two species of birds were identified in 2011 and 62 species of birds were identified in 2012 along the one mile wide study corridor on Cottonwood Creek (Quad Knopf 2013b). Construction of the transmission line will overlap with migration and nesting seasons resulting in the need for pre-construction surveys and avoidance of detected nests.

3.0 PURPOSE OF THE HABITAT ENHANCEMENT PLAN

3.1 Importance of Riparian Habitat to Federally Protected Bird Species

3.1.1 LEAST BELL'S VIREO

The least Bell's vireo is a migratory songbird that is dependent upon riparian habitat for breeding. Historically, this species was widespread throughout riparian woodlands in the San Joaquin valley and low elevation riverine valleys of California and northern Baja California. This species historically ranged from interior northern California near Red Bluff (Tehama County), south through the Sacramento-San Joaquin valleys and Sierra Nevada foothills, and in the Coast Ranges from Santa Clara County south to approximately San Fernando, Baja California, Mexico. Populations were also found in the Owens Valley, Death Valley, and at scattered oases and canyons through the Mojave Desert.

This species has undergone a precipitous decline in numbers due to the loss and degradation of riparian habitat throughout its range, and because of substantial cowbird nest parasitism. Within California, the least Bell's vireo is currently restricted in distribution to eight southern California counties, with the majority of birds occurring in San Diego County.

The least Bell's vireo is an obligate riparian species during the breeding season, preferentially using early-successional habitat. This species typically inhabits structurally diverse woodlands along watercourses, including cottonwood-willow forest, oak woodlands, and mule fat scrub (USFWS 1998). Dominant vegetation species include Fremont cottonwood, arroyo willow, red willow, black willow, mulefat (*Baccharis salicifolia*), laurel sumac (*Malosma laurina*), elderberry (*Sambucus mexicana*), mugwort (*Artemisia douglasiana*), tamarisk, western ragweed (*Ambrosia psilostachya*), and curly dock (*Rumex scirpus*) (Kus 2002). The structure of occupied habitat usually consists of dense cover within three to six feet of the ground and a dense, stratified canopy for foraging (USFWS 1998).

3.1.2 SOUTHWESTERN AND LITTLE WILLOW FLYCATCHERS

The willow flycatcher is a migratory songbird that is dependent upon riparian habitat for breeding. There are four subspecies of the willow flycatcher. The subspecies are differentiated

primarily by subtle differences in color and morphology and their occupation of distinct breeding ranges. Two subspecies of willow flycatcher have breeding ranges occurring to the west of Sierra Nevada Mountains, the little willow flycatcher and the southwestern willow flycatcher. The breeding range of the little willow flycatcher in California is from Tulare County north, along the western side of the Sierra Nevada and Cascades, extending to the coast in northern California (Craig and Williams 1998). The current breeding range of the southwestern flycatcher in California is primarily restricted to the Sierra Nevada/Cascade region, from southeast Shasta County, south to northern Kern County, Santa Barbara County near Buelton, Riverside County within the Prado Basin riparian forest, and several locations in San Diego County (Sedgwick 2000). Hence, the breeding ranges of these two subspecies overlap within the vicinity of the Cross Valley Line Project.

The willow flycatcher has declined in number and in distribution because of the loss and degradation of riparian vegetation. Approximately 90% of California's riparian habitat has been lost to a variety of causes including water diversions and groundwater pumping, overstocking or other mismanagement of livestock, urban development, and recreational development. The southwestern willow flycatcher is also sensitive to cowbird parasitism. The little willow flycatcher is federally listed as a species of special concern by USFWS The willow flycatcher has declined in numbers and in distribution because of the loss and degradation of riparian vegetation. Approximately 90% of California's riparian habitat has been lost to a variety of causes including water diversions and groundwater pumping, overstocking or other mismanagement of livestock, urban development, and recreational development. The southwestern willow flycatcher is also sensitive to cowbird parasitism.

In California, willow flycatcher breeding habitat is typically comprised of moist meadows with perennial streams, lowland riparian woodlands dominated by willows, and cottonwoods or smaller spring-fed or boggy areas with willows or alders (Harris et al. 1988, Whitfield et al. 1997). Riparian deciduous shrubs or trees such as willow or alder are essential elements of willow flycatcher territories (Harris et al. 1988). In lowland riverine habitats, contiguous willow thickets are most often used. These thickets may provide for a habitat edge and/or openings within the willow canopy that are necessary for this species (Harris 1991).

The little willow flycatcher typically uses willow-dominated riparian vegetation (Grinnell and Miller 1944, Harris et al. 1988). Suitable habitat includes moist meadows with perennial streams and smaller spring-fed or boggy areas with willow or alder (Harris et al. 1988). Little willow flycatchers have also been found in other riparian environments of various types and sizes ranging from small willow-surrounded lakes or ponds with a fringe of meadow or grassland to various willow-lined streams, grasslands, or boggy areas (Craig and Williams 1998).

Southwestern willow flycatchers are mostly restricted to river corridors and in general prefer moist, dense shrubby areas, often with standing or running water. The dominant vegetation of the breeding habitat can be composed of vegetation with monotypic high-elevation willows (*S. exigua* or *S. geyeriana*), monotypic exotic vegetation such as tamarisk or Russian olive (*Elaeagnus angustifolia*), native broadleaf dominated vegetation composed of single species (often black willow or other willow species) or mixtures of native broadleaf trees and shrubs including (but not limited to) cottonwood, willows, boxelder (*Acer negundo*), ash (*Fraxinus*

spp.), alder (*Acnus* spp.), and common buttonbush; and mixed native/exotic vegetation of native broadleaf trees and shrubs (such as listed above) mixed with exotic introduced species. The understory is often composed of sedges, rushes, nettles, and other herbaceous wetland plants. Regardless of plant species composition or height, occupied sites always have dense vegetation in the patch interior. These dense patches are often interspersed with small openings, open water, or shorter/sparser vegetation, creating a mosaic that is not uniformly dense. Riparian patches used by breeding flycatchers vary in size and shape, and maybe a relatively dense, linear, contiguous stand or an irregularly shaped mosaic of dense vegetation with open areas. Willow flycatcher have nested in patches as small as 0.8 ha, however, they have not been found nesting in narrow linear habitats that are less than 10 meters wide, although they will use such linear habitats during migration (Sogge et al. 1997).

3.2 Mitigation of Impacts to Federally Protected Bird Species

The Cross Valley Line will not directly impact the riparian habitats at St. John's River or Cottonwood Creek, but it could indirectly impact any wildlife species that occur there. As indicated above, these species potentially include the federally protected least Bell's vireo, southwestern willow flycatcher, and little willow flycatcher. Indirect impacts to a species include any disruption of its normal behavior. Interference, disruption, or prevention of critical behaviors such as foraging, escape, courtship, mating, nest building, or provisioning, could jeopardize an individual's survival. Such behavioral disruption would constitute take. Project activities that could potentially result in this form of take include ground vibrations and loud noises. Other inadvertent activities that could result in this form of take include predator attraction through trash accumulation, hazardous substance spills, fire, and spread of invasive species. The effects of these types of indirect impacts typically diminish with distance. Although indirect impacts to many bird species are often considered inconsequential if ≥250 feet away, more sensitive bird species can be indirectly impacted by activities >500 feet away. The closest Project ground disturbance activities to the St. John's River and Cottonwood Creek are approximately 207 feet and 25 feet away, respectively.

Riparian habitats are clearly critical to these three federally protected bird species. The loss, fragmentation, and degradation of these habitats have greatly contributed to the population declines of these riparian birds. Increasing the functionality of existing riparian habitats, particularly of those that are of relatively low value such as at St. John's River and Cottonwood Creek, is an effective strategy to facilitate the recovery of these birds and other riparian species. This Plan proposes to mitigate potential indirect impacts to the least Bell's vireo, southwestern willow flycatcher, and little willow flycatcher by enhancing the quality of riparian habitat at the St. John's River. This will ultimately have a long-term beneficial effect on these bird species.

4.0 ENHANCEMENT STRATEGY

4.1 Goals and Objectives

The goal of this Plan is to enhance the biological functionality of the riparian habitat along the St. John's River within one year of the proposed activity. This enhancement goal will be achieved by increasing both the number of riparian plant species and the riparian canopy area in

the proximity of the Project area. Implementation of the revegetation tasks outlined in this Plan, including routine monitoring and maintenance activities, is critical to the achievement of this goal.

The proposed restoration mitigation objectives are itemized below:

- Onsite mitigation will include planting of native riparian trees within areas currently devoid of such vegetation along the north and south banks of the St. John's River. These areas will be located outside of the riparian restoration efforts implemented for the Big Creek Rebuild Project mitigation (Figure 5). Enhancement efforts will primarily consist of planting willows. Willows are typical dominant components of the riparian canopies occupied by the bird species addressed in this Plan, and various willow species are currently prevalent at the St. John's River. Propagating willows in the enhancement areas will be the most time-efficient, ecologically compatible, and successful enhancement strategy. The willows to be planted will consist of clippings obtained from various willow species in the proximity of the enhancement area.

- No offsite mitigation will be required and none is planned.

An adaptive management strategy will be used to accommodate the possibility of disruptions to enhancement efforts and to facilitate efficient onsite enhancement of the riparian habitat community. Adaptive management is a strategy used in natural resource management that incorporates changes to management practices based on their success. Adaptive management is a particularly valuable technique for efforts that may yield extremely variable or unsatisfactory results. The conditions of the project site at the St. John's River are such that an adaptive management plan is appropriate. In the event that planted vegetation is destroyed by public recreational use, and therefore fails to meet the success criteria (see below) for the restoration objectives, SCE will not be held accountable for the detrimental effects. The best effort will be made to ensure long-term success of the restoration goals through habitat management and effectiveness monitoring.

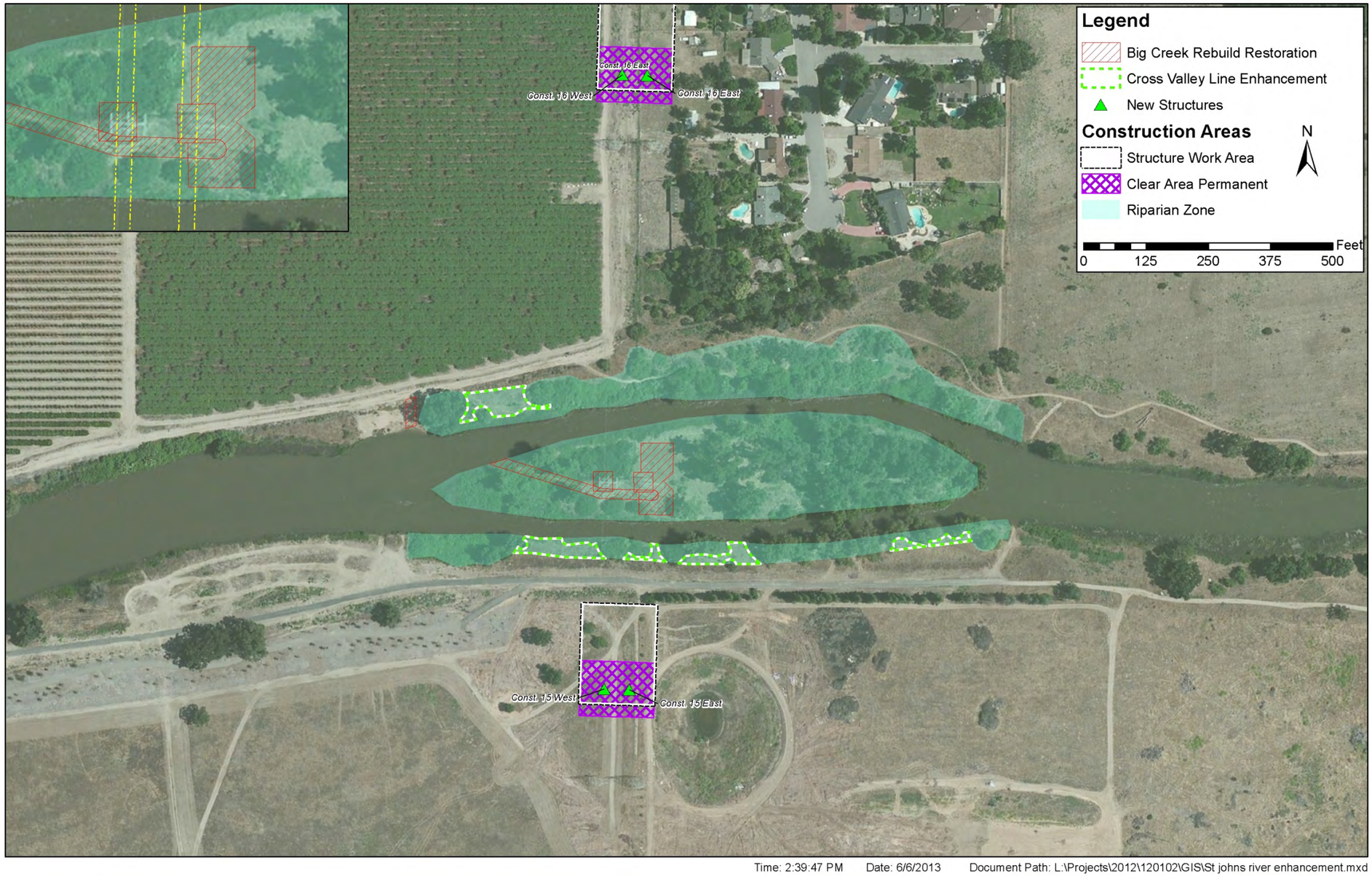
4.2 Revegetation Method

4.2.1 TREE PLANTING

Enhancement will consist of planting willow clippings obtained from various species found within SCE ROW at the St. John's River. The primary willow species currently occurring there are Gooding's willow and arroyo willow. Approximately 200 willow clippings will be planted throughout an area encompassing approximately 0.44 acres (Figure 5).

4.2.2 PLANTING SCHEDULE

Clippings will be planted during late winter (February) when the soil is wet and not too cold.



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Quad Knopf

CROSS VALLEY LINE ENHANCEMENT AREA, TULARE COUNTY, CALIFORNIA

Figure 5

4.2.3 SITE PREPARATION

Site preparation is expected to be minimal. Propagating willow cuttings is relatively easy as long as the soil is wet. Cuttings are inserted directly into the soil with buds pointed upwards. The soil must be free of weeds, but no compost or soil amendments are necessary. After insertion, the soil simply needs to be firmed to stabilize the cutting. No fertilizers will be applied to the enhancement area either before or after planting because these supplements can encourage the establishment of invasive plants.

4.2.4 IRRIGATION

The need for supplemental irrigation is not anticipated at this time.

4.3 Success Criteria

Enhancement efforts will be associated with defined success criteria to ensure that stated objectives are adequately met. Success is most effectively measured using quantitative parameters, however, qualitative parameters may also provide useful supplemental evidence of success. Success criteria are subject to the approval of the USFWS through the acquisition of an ITP. The following success criteria are recommended:

- A survival rate of 75% of planted trees for a period of three consecutive years with or without assistance (e.g., irrigation methods and other maintenance activities). If remedial planting is required, an additional two years will be added for obtaining a 75% survival rate. A 75% survival rate is anticipated to be achieved within the first three years in the absence of disturbance. Problematically, local residents do use the vicinity of the enhancement area during periods of low flow in the river. The impact from local residents on revegetation efforts has the potential to interfere with success criteria. In the event that success criteria are not met after three years, a qualified biologist will make a determination as to whether disturbance by local residents was the cause. If such is the case, SCE will not be held liable for further mitigation actions.

5.0 MONITORING AND ADAPTIVE MANAGEMENT

Monitoring of the enhancement will be conducted by a qualified biologist to determine if success criteria are being met and if remediation is required. The biological monitor will determine the extent of disturbance related to resident recreational use of the proposed activity site and whether remedial planting is required should success criteria not be met.

5.1 Monitoring Goals

Monitoring will be undertaken by a qualified biologist to ensure that the success criteria for enhancement efforts are met by the end of three years, or as much as five years if remediation is required. Issues that may potentially jeopardize the success of the enhancement efforts will be identified as early as possible to allow for the quick development and implementation of remedial actions. If local residents are determined to be the cause of failure to meet the success

criteria, SCE will not be held responsible and remediation will not be required. Inspections of the revegetation efforts will consist of:

- Assessing the status of each tree planted, and calculating the overall survival rate for each species from the number of living plants compared to the number of planted plants;

- Determining the success of individual maintenance tasks, and recommending any modifications to those tasks that are deemed necessary;

- Identifying remedial actions that need to be taken (e.g. compensatory planting, or modifications to the groundcover seed palette composition) factoring in disturbance from local residents; and

- Identifying noxious plants for removal.

5.2 Monitoring Schedule

Early identification of issues that could potentially jeopardize restoration goals is best accomplished through regularly scheduled monitoring. Inspections will be conducted biannually during the three-year monitoring period in the months of March and September. This schedule is provisional and subject to change upon findings that indicate success criteria will not be met, provided that success criteria are not interfered with by resident recreational use of the proposed activity site. It is anticipated that success criteria will be achieved within three years in the absence of disturbance, however, monitoring should continue for two consecutive years if success criteria are not met and remediation is required. This may result in as few as three year of monitoring if success criteria are realized within the first year, or for a maximum of five years if meeting success criteria requires remedial planting.

5.3 Remedial Planting

Remedial planting of the trees, shrubs or groundcover along the river banks may be necessary if it is determined that 75% success rate will not be achieved within three years. Remedial planting of trees, if needed, will consist of a qualified biologist taking clippings from local plants and planting those clippings within the proposed enhancement area at a density reflective of willow tree populations thriving in the vicinity. Remedial propagation of clippings will be implemented during February. Supplemental irrigation will be arranged as necessary if it is determined that the initial clippings failed due to insufficient hydration.

5.4 Reporting

A Restoration Monitoring Report will be prepared annually by a qualified biologist. The Restoration Monitoring Report will be submitted to the USFWS in December of each year until the success criteria have all been met. The report will include an assessment of the status of revegetation, effectiveness of management methods, and whether or not the revegetation is expected to achieve the success criteria. If necessary, the Restoration Monitoring Report will propose additional measures that will be conducted during the following year to more efficiently

achieve success criteria. Photo documentation of maintenance and monitoring activities will accompany each of the annual reports.

6.0 REFERENCES

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APPENDIX G

Summary of Avoidance and Minimization Measures for the Cross Valley Line

Table G-1 Summary of Avoidance and Minimization Measures for the Cross Valley Line		
Number	Title	Description
Standard Measures for Planning and Design (PD)		
PD-1	Inventory Sensitive Biological Resources to Inform Project Planning and Design	Biological resources will be inventoried during project planning and design. These resources will include land cover types, waters of the State and U.S., and reconnaissance surveys for special-status species.
PD-2	Plan and Design Project Features to Avoid and/or Minimize Effects on Biological Resources	To the extent feasible, the final project design shall minimize impacts on Covered Species (including effects on suitable habitat) that have been identified in the HCP Planning Area (e.g., by designing TSPs and LSTs to avoid occupied habitat).
PD-3	Design Roads to Avoid Sediment Loading to Surface Waterways	For all segments of new access roads that would be within 300 feet of an existing surface water channel (including irrigation ditches where no berm or levee is currently in place) and traverse a ground slope greater than 2 percent, the following protective measures shall be installed: • As needed, permanent access roads shall be in-sloped. • TSPs and LSTs shall be located to avoid waterways to the extent feasible.
General Avoidance and Minimization Measures for Construction (C)		
C-1	Conduct Environmental Awareness Training for Workers	SCE workers and SCE contract workers must undergo training through the Worker Environmental Awareness Program (WEAP) before they are allowed on the construction site and before they begin implementing Covered Activities. This training includes a description of biological resources that could occur within the HCP Planning Area; laws and regulations that protect these resources; environmental requirements of the HCP, including all relevant conservation measures and the environmental responsibilities of each worker; and consequences if requirements are not met. Copies of the final HCP and the incidental take permit (ITP) must be on-site and easily available to monitors and all workers implementing HCP Covered Activities. Upon completion of the WEAP, workers shall sign a form stating they attended the program and understand all protection measures. These forms shall be filed at the worksite offices and be available to the agencies upon request. SCE qualified biological monitors will conduct the WEAP training and be on-site daily to ensure compliance with the HCP and AMMs.
C-2	Implement Nesting Bird Avoidance	A Nesting Bird Management Plan has been developed and reviewed by CDFW and USFWS (see Appendix E). This plan details survey and buffer area requirements for nesting birds during implementation of the HCP Covered Activities. SCE and/or its contractors shall implement the following measures to avoid impacts on nesting raptors and other migratory birds for activities that are scheduled during the breeding season (February 1 through August 31): • No more than 2 weeks before land disturbance begins, a qualified wildlife biologist will conduct preconstruction surveys of all potential nesting habitat within 500 feet of the land disturbance sites. • If active nests are not identified, no further action is necessary. If active nests are identified during preconstruction surveys, a no-disturbance buffer will be created around active raptor nests and nests of other migratory birds during the breeding season, or until it is determined that all young have fledged. Typical buffers are 500 feet for raptors and 250 feet for other nesting birds (e.g., waterfowl, and passerine birds). The size of these buffer zones and types of construction activities that are allowed in these areas could be further modified in coordination with CDFW and USFWS and will

Table G-1 Summary of Avoidance and Minimization Measures for the Cross Valley Line		
Number	Title	Description
		consider existing noise and disturbance levels in the HCP Planning Area near the proposed ground disturbance site.
C-3	Map Environmentally Sensitive Areas	There will be formal designation of Environmentally Sensitive Areas on the project's database for avoidance during implementation of the construction Covered Activities. Weekly Environmentally Sensitive Area maps will be created and distributed to the construction and maintenance crews to illustrate resource areas and construction requirements within those areas. The boundaries of the construction footprint as well as Environmentally Sensitive Areas will be delineated in the field through the placement of high-visibility flagging, stakes, and/or fencing.
C-4	Restrict Vehicle Speeds and Travel	SCE workers and SCE contractors' vehicles will maintain a daytime speed limit of 20 miles per hour (mph) in the HCP Planning Area. Nighttime vehicle traffic will be limited to emergencies. If nighttime travel is necessary, the speed limit shall be reduced to 10 mph. Off-road construction travel in the HCP Planning Area that is not specifically identified as a construction Covered Activity will be prohibited.
C-5	Prohibit Pets	Pets are prohibited by SCE personnel and contractors during Covered Activities within the HCP Planning Area over the term of the permit.
C-6	Implement Noxious Weed and Invasive Plant Control Plan	SCE will implement a project-specific Noxious Weed and Invasive Plant Control Plan during the construction period (Appendix C). This plan is consistent with standard Best Management Practices. The plan addresses any required cleaning of vehicles to minimize spread of noxious weeds and invasive plants.
C-7	Implement Fire Prevention and Control Plan	A Fire Prevention and Control Plan will be developed and applied during Covered Activity implementation to prevent wildfires and control wildfires if started. The fire plan includes the following: • SCE and/or its contractors will have water tanks and/or water trucks sited/available in the HCP Planning Area for fire protection. • All construction and maintenance vehicles will have fire suppression equipment. • Construction personnel will be required to park vehicles away from dry vegetation. • Prior to implementation of a construction Covered Activity, SCE will contact and coordinate with the California Department of Forestry and Fire Protection (CAL FIRE) and applicable local fire departments (i.e., Tulare County, City of Visalia, and City of Farmersville) to determine the appropriate amounts of fire equipment to be carried on the vehicles and appropriate locations for the water tanks if water trucks are not used. • SCE will submit verification of its consultation with CAL FIRE and the local fire departments to the CPUC. • All diesel- and/or gasoline-operated engines, both stationary and mobile, and all flues used in any construction Covered Activities and camp operations will be equipped with spark arresters. Spark arresters are not required on equipment powered by exhaust-driven turbo-charged engines or motor vehicles equipped with a maintained muffler as defined in the California Public Resources Code (PRC), Sections 4442 and 4443.
C-8	Restrict Equipment Fueling and Maintenance near Waterways	No fueling or maintenance of vehicles or equipment will occur within 250 feet of vernal pool or aquatic habitats.

Table G-1 Summary of Avoidance and Minimization Measures for the Cross Valley Line		
Number	Title	Description
C-9	Control Erosion near Waterways and Suitable Habitat for Covered Species	Erosion control measures will be implemented where necessary and prior to any land disturbance, to reduce erosion and avoid additional sedimentation into jurisdictional waters of the U.S. and waters of the State, including drainages and seasonal wetlands, as well as habitat occupied by Covered Species when Covered Activities have the potential to cause soil erosion. See Section 2.2.6., Installation of Storm Water Pollution Prevention Plan Best Management Practices, for more information.
C-10	Remove Trash	All food-related trash and microtrash (e.g., nuts, bolts, and wires) will be disposed of in closed containers and removed daily from the HCP Planning Area.
C-11	Construct Locking Gates at Strategic Locations On Access Roads	Gates will be placed at strategic locations along access roads in consultation with landowners. These gates will be locked to discourage public access to the HCP Planning Area via the transmission line access roads.
General Avoidance and Minimization Measures for Operations and Maintenance (O&M)		
O&M-1	Prepare Operation and Maintenance Environmental Compliance Plan	At the time of completion of construction, an Operations and Maintenance Environmental Compliance Plan will be prepared to guide personnel conducting Covered Activities during the HCP term. This plan will provide guidelines for resource protection and will provide maps of sensitive resources and appropriate buffers to be implemented within the HCP Planning Area (see AMM O&M-3 below).
O&M-2	Conduct Environmental Awareness Training for Workers	SCE personnel and SCE contract workers performing O&M Covered Activities within the HCP Planning Area must undergo training through the WEAP before they begin implementing Covered Activities. This training includes a description of biological resources that could occur at the activity site; the laws and regulations that protect these resources; identification of protected biological resource characteristics and existing locations within the HCP Planning Area; environmental requirements of the HCP, including all relevant conservation measures and the environmental responsibilities of each worker; and consequences if requirements are not met. Information will be provided to field personnel, so that SCE field personnel can identify special-status species and suitable habitats to support these species within the transmission line corridor in order to minimize disturbance to these resources. Copies of the final HCP and the ITP must be on-site and easily available to monitors and all workers implementing HCP Covered Activities. Upon completion of the WEAP, workers shall sign a form stating they attended the program and understand all protection measures. These forms shall be filed at the worksite offices and be available to the agencies upon request. SCE qualified biological monitors will conduct the WEAP training and be on-site daily to ensure compliance with the HCP and AMMs.
O&M-3	Map Environmentally Sensitive Areas	There will be formal designation of all Environmentally Sensitive Areas on the project's database for avoidance during implementation of the O&M Covered Activities. Covered Species and associated habitats will be incorporated onto field maps that SCE field personnel and contractors will use while conducting O&M Covered Activities to limit the timing of specific activities or restrict activities unless an SCE biologist is present. SCE personnel and contractors shall consult their field maps to ensure that protected resources identified in the maps are avoided. If these resources cannot be avoided, SCE personnel shall notify Corporate Environmental Services for guidance. The boundaries of the O&M activity footprint as well as Environmentally Sensitive Areas will be delineated in the field through the placement of high-visibility flagging, stakes, and/or fencing.

Table G-1 Summary of Avoidance and Minimization Measures for the Cross Valley Line		
Number	Title	Description
O&M-4	Conduct Environmental Screening Process	SCE has an Environmental Screening Process for ground-disturbing activities (EHS-EP0DR-002). This is an internal process for screening ground-disturbing, O&M Covered Activities within natural land cover types or on public land. It requires SCE project planners, technical specialists, and/or construction personnel to complete an Environmental Screening Form (ESF) to initiate an environmental review before the commencement of construction or ground-disturbing Covered Activities. The internal ESF process aids SCE in the assessment of protected resources, including biological, cultural, and jurisdictional waters, which have a potential to occur in the area prior to the start of work; and provides avoidance and minimization requirements that must be implemented during work.
O&M-5	Conduct Pre-Activity Surveys and Monitoring Class 2 O&M Activities	Pre-activity surveys and monitoring will be conducted for scheduled, nonemergency Class 2 O&M Covered Activities planned in the designated Environmentally Sensitive Areas of the HCP Planning Area (see AMM O&M-3). Surveys will include sweeps of the area and avoidance of sensitive resources.
O&M-6	Stay on Existing Access Roads	All SCE and SCE contract worker vehicles, including heavy equipment used during O&M Covered Activities (i.e., patrol vehicles and water trucks used during insulator washing) will remain within the existing access road prism (i.e., drivable surface, shoulders, and cut/fill slopes), structure pads, and disturbed areas that are associated with the specific O&M Covered Activity to the greatest extent possible.
O&M-7	Restrict Vehicle Speeds and Travel	Vehicles will maintain a speed limit of 20 mph along private dirt roads in the right-of-way of the HCP Planning Area. Nighttime vehicle traffic will be limited to emergencies. If nighttime travel is necessary, the speed limit shall be reduced to 10 mph. Off-road travel in the HCP Planning Area that is not specifically identified as an O&M Covered Activity will be prohibited.
O&M-8	Prohibit Pets	Pets are prohibited by SCE personnel and contractors within the HCP Planning Area over the term of the permit.
O&M-9	Restrict Equipment Fueling and Maintenance near Waterways	Fueling and maintenance of vehicles and other equipment are prohibited within 250 feet of a vernal pool, stock pond, wetland, stream, or other aquatic habitat or waterway unless a bermed and lined refueling area is constructed.
O&M-10	Control Erosion near Waterways and Suitable Habitat for Covered Species	As discussed in Section 2.3.14, Installation of Storm Water Pollution Prevention Plan Best Management Practices, erosion control measures will be implemented where necessary and prior to any land disturbance, to reduce erosion and avoid sedimentation into jurisdictional waters of the U.S. and waters of the State, including drainages and seasonal wetlands, as well as habitat occupied by Covered Species when Covered Activities have potential to cause soil erosion.
O&M-11	Implement Fire Prevention and Control Plan	SCE personnel and SCE contract workers will follow all guidelines set forth in the Fire Prevention and Control Plan, which will be developed as a portion of the Operation and Maintenance Environmental Compliance Plan (see O&M-1). At a minimum, the following guidelines will be included in the plan: • SCE and/or its contractors will have water tanks and/or water trucks sited/available in the HCP Planning Area for fire protection. • All workers will be required to park vehicles away from dry vegetation. • All maintenance vehicles will have fire suppression equipment.

Table G-1 Summary of Avoidance and Minimization Measures for the Cross Valley Line		
Number	Title	Description
		• All diesel- and/or gasoline-operated engines, both stationary and mobile, and all flues used in any Covered Activities and camp operations will be equipped with spark arresters. Spark arresters are not required on equipment powered by exhaust-driven turbo-charged engines or motor vehicles equipped with a maintained muffler as defined in PRC Sections 4442 and 4443.
O&M-12	Revegetate Temporarily Disturbed Areas	Based on landowner consent and SCE rights, areas temporarily disturbed, outside of SCE access roads and TSP/LST structure pads will be revegetated by loosening compacted soils, and, in grasslands, applying a seed mix that is certified as weed free.
O&M-13	Remove Trash	All food-related trash and microtrash (e.g., nuts, bolts, and wires) shall be disposed of in closed containers and removed daily from the HCP Planning Area where O&M Covered Activities occur.
O&M-14	Prepare and Implement Noxious Weed and Invasive Plant Control Plan	SCE will develop and implement a Noxious Weed and Invasive Plant Control Plan for Class 2 O&M activities consistent with standard best management practices.
Habitat- and Species-Specific Avoidance and Minimization Measures		
VP-1	Avoid and/or Minimize Effects on Vernal Pool/Swale Habitat	During construction and Class 2 O&M activities, SCE and SCE contract workers and equipment will avoid vernal pools, vernal swales, basins, and stock ponds to the maximum extent practicable, by fencing or staking a minimum buffer of 250 feet around all vernal pools, vernal swales, basins, and stockponds in the HCP Planning Area. If a full 250-foot buffer area around a particular feature would not allow construction or O&M Covered Activity to occur, a smaller buffer of the maximum size possible will be delineated by SCE or its designated biologist prior to the implementation of construction or O&M Covered Activity. The buffer will be delineated in the field through the placement of high-visibility flagging, stakes, and/or fencing by SCE or its designated biologist. The designated biologist will monitor this buffer for avoidance during the implementation of construction and O&M Covered Activities and ensure that no activities, including vegetation and soil disturbance, occur within the marked boundary of the buffer avoidance.
VP-2	Monitor Activities Near Marked Buffers around Vernal Pool/Swale Habitat	A biological monitor employed by SCE and experienced with vernal pool habitats and associated vernal pool flora and fauna will be present during all construction and Class 2 O&M Covered Activities implemented within 500 feet of a vernal pool or swale, basin, stockpond, or puddle occurring in annual grassland. The biologist can temporarily stop work if he or she determines that the protected feature is being encroached upon by a construction or O&M Covered Activity that may affect the feature designated for avoidance.
VP-3	Mitigate Unavoidable Impacts on Vernal Pool/Swale Habitat	SCE will mitigate for the temporary disturbance and permanent direct and indirect loss of vernal pool/swale habitat suitable for vernal pool Covered Species resulting from construction or O&M Covered Activities by providing compensatory habitat through (1) purchasing mitigation credits at a USFWS-approved conservation bank(s); (2) preserving in perpetuity compensatory habitat for Covered Species at a USFWS-approved "turnkey" mitigation site; (3) a combination of the above; or (4) other means acceptable to USFWS.

Table G-1 Summary of Avoidance and Minimization Measures for the Cross Valley Line		
Number	Title	Description
VELB-1	Mark and Avoid Buffer Areas around Elderberries	Around elderberries with one or more stems greater than or equal to 1 inch in diameter, SCE will establish buffer areas that are a minimum of 100 feet in width measured from the dripline of the plant (USFWS, 1999). If a full 100-foot buffer area cannot be established around a particular elderberry, a smaller buffer of the maximum size possible (and at least 20 feet from the dripline of the shrub) will be established. Prior to implementation of construction or Class 2 O&M Covered Activities, these buffers will delineated in the field through the placement of high-visibility flagging, stakes, and/or fencing by SCE or its designated biologist. Vegetation and soil disturbance will not occur within these buffer areas. These areas will remain marked for avoidance until the Covered Activity is completed.
VELB-2	Mitigate Unavoidable Impacts on Elderberries	Where impacts on valley elderberry longhorn beetle habitat from construction or O&M Covered Activities cannot be avoided, SCE will provide compensatory mitigation in accordance with USFWS guidelines (USFWS, 1999), or another means acceptable to USFWS. Elderberry shrubs that cannot be avoided will be transplanted or replaced at a USFWS-approved facility according to stem count and habitat guidelines (USFWS, 1999). USFWS general compensation guidelines call for replacement of elderberry plants in designated mitigation areas at a ratio from 2:1 to 5:1 for each stem greater than 1 inch in diameter (USFWS, 1999). Note that replacement ratios are by stem and not by elderberry shrub. In addition, a mix of native plants must be planted at the transplant site. Cuttings from the elderberry shrub to be removed will be utilized if the cuttings are viable. Otherwise, locally available nursery stock will be utilized for additional plantings. Implementation of this compensatory mitigation measure is contingent on the species status as a Federally listed species at the time of permit issuance. Regardless of change in listing status of an HCP Covered Species after, permit issuance, the HCP's conservation strategy for that species must be implemented as described in the permitted HCP document and the permit terms and conditions.
CTS-1	Conduct Preactivity Clearance Surveys for California Tiger Salamander	Where equipment or materials have been stored overnight, each day, before the start of work, the USFWS-approved biological monitor will check for adult and juvenile California tiger salamander under any equipment to be used that day. If California tiger salamanders are present, they will be allowed to leave on their own volition, before the initiation of Covered Activities for the day. If salamanders are trapped or do not move on their own, a USFWS-approved biologist possessing a valid ESA Section 10(a)(1)(a) permit, or USFWS-approved biologist under an active Biological Opinion, will be used to move the salamander to a nearby ground-squirrel burrow opening or other suitable habitat (USFWS and DFW, 2003).
CTS-2	Cover Excavated Holes or Trenches That Could Trap California Tiger Salamanders	To prevent inadvertent entrapment of California tiger salamanders during construction or Class 2 O&M activities, all excavated, step-walled holes or trenches more than 1 foot in depth will be covered by plywood or similar materials at the close of each working day. Escape ramps constructed of earth fill or wooden planks will be installed. When trenches covers are opened again, and before such holes or trenches are filled, they must be thoroughly inspected by a USFWS-approved biologist for trapped animals.

Table G-1 Summary of Avoidance and Minimization Measures for the Cross Valley Line		
Number	Title	Description
CTS-3	Prohibit Use of Monofilament Netting	Plastic monofilament netting (erosion control matting) or similar material will not be used within the HCP Planning Area because California tiger salamanders may become entangled or trapped. Examples of acceptable substitutes include coconut coir matting, weed-free straw and tackified hydroseeding compounds. Silt fencing required in California tiger salamander habitat as part of a storm water pollution prevention plan will be installed with appropriate overlapping gaps in the fencing so as to allow salamander passage.
CTS-4	Avoid or Minimize Effects to Burrow Complexes	Prior to ground-disturbing activities (i.e., construction and Class 2 O&M Covered Activities) in all land covers within 1.24 miles of aquatic breeding habitat suitable for California tiger salamander, a USFWS-approved biologist will survey for and flag the presence of ground squirrel and gopher burrow complexes. Where burrow complexes are present within 250 feet of potential work areas and can be avoided, a buffer will be marked to minimize potential disturbance to California tiger salamander. If a 250-foot buffer is not possible, a smaller buffer of the largest size practicable will be established. The buffer will be delineated in the field through the placement of high-visibility flagging, stakes, and/or fencing by SCE or its designated biologist. The designated biologist will monitor this buffer for avoidance during the extent of construction and O&M Covered Activities and ensure that no activities, including vegetation and soil disturbance, occur within the marked boundary of the buffer avoidance.
CTS-5	Mitigate Unavoidable Impacts on California Tiger Salamander	SCE will mitigate for the temporary disturbance and permanent direct and indirect loss of breeding habitat suitable for California tiger salamander and the temporary disturbance and permanent direct loss of upland aestivation habitat suitable for California tiger salamander that results from construction or O&M Covered Activities by providing compensatory habitat through: (1) purchasing mitigation credits at a USFWS-approved conservation bank(s); (2) preserving in perpetuity compensatory habitat for Covered Species at a USFWS-approved “turnkey” mitigation site; (3) combination of the above; or (4) other means acceptable to USFWS.
WSFT-1	Conduct Preactivity Clearance Surveys for Western Spadefoot Toad	Where construction and Class 2 O&M Covered Activities occur in grasslands within 1.24 miles of suitable western spadefoot toad aquatic habitat, and where equipment or materials have been stored overnight, a USFWS-approved biological monitor will check daily for toads under any equipment to be used that day before the start of work. If western spadefoot toads are present, they will be allowed to leave on their own volition before the initiation of construction activities for the day. If western spadefoot toads are trapped or do not move on their own volition, a USFWS-biologist will trap and move toads to nearby suitable habitat if any are found inside the area marked for avoidance.
WSFT-2	Cover Excavated Holes or Trenches That Could Trap Western Spadefoot Toad	To prevent inadvertent entrapment of western spadefoot toad during construction or Class 2 O&M activities, all excavated, step-walled holes or trenches more than 1 foot in depth will be covered by plywood or similar materials at the close of each working day. Escape ramps constructed of earth fill or wooden planks will be installed. When trenches covers are opened again, and before such holes or trenches are filled, they must be thoroughly inspected by a USFWS-approved biologist for trapped animals.
BO-1	Conduct Preconstruction Surveys for Burrowing Owl	A USFWS-approved biologist will conduct preconstruction surveys for burrowing owls no more than 14–30 days prior to the start of each new construction phase and prior to Class 2 O&M activities disturbing soil in agricultural row crops or grasslands that may support burrowing owl. The most current CDFW protocol will be followed.

Table G-1 Summary of Avoidance and Minimization Measures for the Cross Valley Line		
Number	Title	Description
		Surveys will cover grassland areas within a 500-foot buffer from all project construction sites within suitable grasslands habitat, checking for adult and juvenile burrowing owls and owl nests. If owls are detected during surveys, occupied burrows will not be disturbed, where feasible.
BO-2	Establish Exclusion Areas around Occupied Burrows	For construction and Class 2 O&M Covered Activities, buffer areas will be marked around occupied burrows. No equipment or land disturbance will be allowed in the buffer areas. During the nonbreeding season (September 1 through January 31), the buffer area will extend 160 feet around occupied burrows. During the breeding season (February 1 through August 31), buffer areas will extend 250 feet around occupied burrows. If a full 160-foot or 250-foot- buffer cannot be maintained around a particular burrow, a smaller buffer of the maximum size possible will be delineated in coordination with USFWS and CDFW.
BO-3	Relocate Owls from Unavoidable Occupied Burrows	Where HCP land-disturbing construction and Class 2 O&M Covered Activities cannot avoid occupied burrows, passive relocation of on-site owls may be implemented during the nonbreeding season (September 1 through January 31), with prior CDFW approval. Passive relocation will be accomplished by an approved biologist installing one-way doors on the entrances of burrows that cannot be avoided. The one-way doors will be left in place for 48 hours to ensure the owls have left the burrow. The burrows will then be hand-excavated by an approved biologist. Construction and Class 2 O&M Covered Activities will not proceed within 160 feet of occupied burrows until the activity area is deemed to be freed of owls by the approved biologist.
BO-4	Compensate for Unavoidable Loss of Suitable Burrowing Owl Habitat	SCE will mitigate for the temporary disturbance and permanent direct loss of grassland and agricultural row crop habitat suitable for burrowing owl resulting from construction or O&M Covered Activities by providing compensatory habitat through: (1) purchasing mitigation credits at a USFWS-approved conservation bank(s); (2) preserving in perpetuity compensatory habitat for Covered Species at a USFWS-approved "turnkey" mitigation site; (3) a combination of the above; or (4) other means acceptable to USFWS.
Nesting Birds-1	Avoid or Minimize Effects of Construction and Class 2 O&M Activities on Nesting Birds	To avoid or reduce the effects of construction and planned (i.e., nonemergency), Class 2 O&M Covered Activities on bird Covered Species, SCE will implement the following measures: (A) Construction and Class 2 O&M Covered Activities in and adjacent to riparian land cover will be scheduled during non-nesting periods (September 1 through January 31). (B) No more than 2 weeks before the construction or Class 2 O&M Covered Activity in riparian land cover that could support nesting birds protected by the Migratory Bird Treaty Act, a qualified wildlife biologist will conduct preconstruction surveys of all potential nesting habitat within 500 feet of the construction/O&M site where access is available.

Table G-1 Summary of Avoidance and Minimization Measures for the Cross Valley Line		
Number	Title	Description
		(C) If active nests are not identified, no further action is necessary. If active nests are identified during preconstruction surveys, a no-disturbance buffer shall be created around active raptor nests and nests of other special-status birds during the breeding season, or until it is determined that all young have fledged. Typical buffers are 500 feet for raptors and 250 feet for other nesting birds (e.g., waterfowl, and passerine birds). The size of these buffer zones and types of construction activities that are allowed in these areas could be further modified during construction and O&M Covered Activities in coordination with CDFW and USFWS and shall be based on existing noise and disturbance levels in the project area.
Nesting Birds-2	Mitigate Unavoidable Impacts	The biological functionality of riparian habitat would be enhanced along the St. John's River within 12 months, in accordance with the Riparian Habitat Management Plan (Appendix F).
SJKF-1	Conduct Surveys for Kit Fox during Construction and Class 2 O&M Activities within or Adjacent to Suitable Kit Fox Habitat	For ground-disturbing construction and nonemergency Class 2 O&M Covered Activities implemented over the 30-year permit term, surveys for San Joaquin kit fox will be conducted by an approved biologist within a 200-foot area surrounding the facility footprints, graded work areas, and ungraded work areas, no less than 14 days and no more than 30 days prior to the start of an Covered Activity. Surveys will identify San Joaquin kit fox habitat features at the Covered Activity site, and evaluate their potential use by this species. The status of all potential dens will be defined (USFWS, 2011), and mapped. Written results of the preconstruction/pre-activity surveys will be sent to USFWS within 5 days after survey completion and prior to start of ground disturbance and/or start of the Covered Activity. If a known or suspected natal /pupping den is discovered in or within 200 feet of a facility footprint/ work area, USFWS will be immediately notified. The den will not be disturbed or destroyed without prior written authorization by USFWS. Because a great percentage of occupied dens show no evidence of use, and because the kit foxes change dens often, the status of a given den may change frequently and abruptly. All potential dens found in or within 200 feet of a facility footprint/graded work area shall be monitored by an approved biologist for at least three consecutive nights to determine if the den is in use or has been used in the past. Evidence of use may include kit fox sign such as tracks, scat, and/or prey remains, current spotlighting or radio telemetry data, and CNDDB or other records. If the den is in use or has been used, the den will then be monitored by an approved biologist for an additional 3 consecutive days with tracking medium or infra-red beam camera to determine the current use. If no kit fox activity is observed during this second 3-day period, dens located within the facility footprint or graded work area will be immediately destroyed under the oversight of the authorized biologist to preclude subsequent use by kit fox. The entire den will be carefully excavated, filled with soil, and compacted to ensure that kit fox cannot reenter the den while the Covered Activity is being implemented. If kit fox activity is observed at a den located within facility footprint or graded work-area during this second 3-day period, the den shall be monitored for least 5 additional days (USFWS, 2011), and the authorized biologist or SCE will immediately contact USFWS for additional guidance.

Table G-1 Summary of Avoidance and Minimization Measures for the Cross Valley Line		
Number	Title	Description
SJKF-2	Establish Buffers Around Active Kit Fox Dens	Ground-disturbing construction and nonemergency Class 2 O&M Covered Activities implemented over the 30-year permit term must avoid San Joaquin kit fox dens located within 200 feet of facility footprints, graded work areas, ungraded work areas, and off-road travel corridors. The size of the exclusion buffer area around each den will have a radius measured outward from the entrance or cluster of entrances due to the length of the dens underground. The following distances are minimums, and if they cannot be followed, USFWS will be contacted: • Potential Den = 50-foot buffer zone • Atypical Den = 50-foot buffer zone • Known Den = 100- to 200-foot buffer zone • Natal/Pupping Den (occupied and unoccupied) = contact USFWS To ensure protection, the buffer area will be demarcated by fencing that encircles each den at the appropriate distance and does not prevent access to the den by San Joaquin kit foxes. Acceptable fencing for known dens will be untreated wood particle-board, orange construction fencing, or fencing approved by USFWS that has openings for kit fox ingress/egress and keeps humans and equipment out. However, fencing of potential dens may be limited to placement of four to six flagged stakes each 50 feet from the den entrances(s). SCE will ensure that the buffer-zone exclusion fencing is maintained through weekly monitoring until Covered Activities are completed at the site. All fencing will be removed after activities are completed. If kit fox occupancy is determined at a given site or within 200 feet of a Covered Activity site during implementation of AMM SJKF-1, implementation of that Covered Activity will immediately be halted and USFWS will be contacted.
SJKF-3	Cover Excavated Holes and Trenches	To prevent accidental entrapment of kit fox or other animals during construction and Class 2 O&M Covered Activities, all excavated holes, ditches, or trenches greater than 1 foot deep will be covered at the end of each work day by suitable materials, or escape routes constructed of earthen materials or wooden planks will be provided. After opening and before filling, such holes, ditches, and trenches will be thoroughly inspected by an authorized biologist for trapped animals.
SJKF-4	Visually Inspect Stored Tubular or Open-Ended Materials and Equipment	At all Covered Activity sites, any pipes, culverts, or other tubular or open-ended materials and equipment that are stored at an activity site for one or more overnight periods will be inspected for animals prior to moving, burying, capping, or moving the pipe in any way to ensure that no animals are present within the materials or equipment. If a San Joaquin kit fox is discovered inside a pipe, that section of pipe will not be moved until USFWS has been consulted.
SJKF-5	Monitor O&M Activities near Active Kit Fox Dens	Monitoring will occur if San Joaquin kit fox dens are documented within 200 feet of Class 2 O&M Activities, in accordance with USFWS guidelines (USFWS, 2011).
SJKF-6	Restrict Rodenticide Use	Rodenticide use will be prohibited by SCE and SCE contract workers within the HCP Planning Area over the 30-year permit term to avoid poisoning of kit fox or their prey, per USFWS guidelines (USFWS, 2011).

Table G-1 Summary of Avoidance and Minimization Measures for the Cross Valley Line		
Number	Title	Description
SJKF-7	Mitigate Unavoidable Impacts	SCE will mitigate for the temporary disturbance and permanent direct loss of grassland and agricultural lands suitable for San Joaquin kit fox resulting from construction or O&M Covered Activities by providing compensatory habitat through: (1) purchasing mitigation credits at a USFWS-approved conservation bank(s); (2) preserving in perpetuity compensatory habitat for Covered Species at a USFWS-approved "turnkey" mitigation site; (3) a combination of the above; or (4) other means acceptable to USFWS.
SSBC-1	Restrict Herbicide Use near Occupied Spiny-Sepaled Button-Celery Habitat	Herbicide applications over the 30-year permit term within 100 feet of habitat occupied by spiny-sepaled button-celery will be restricted to spot applications developed in coordination with USFWS. USFWS will review proposed herbicide application guidelines to avoid or minimize effects on suitable habitat for spiny-sepaled button-celery. These herbicide treatments will be by licensed applicators using hand-held equipment consistent with label requirements, and primarily for the purpose of noxious weed control.
SSBC-2	Mitigate Unavoidable Impacts	SCE will mitigate for the temporary disturbance and permanent direct and indirect loss of habitat occupied by spiny-sepaled button celery resulting from construction or O&M Covered Activities by providing compensatory habitat through either: (1) preserving in perpetuity compensatory habitat for Covered Species at a USFWS-approved "turnkey" mitigation site or (2) other means acceptable to USFWS.

Notes: AMM = avoidance and mitigation measure; CAL FIRE = California Department of Forestry and Fire Protection; CDFW = California Department of Fish and Wildlife; CNDDB = California Natural Diversity Database; CPUC = California Public Utilities Commission; ESA = Endangered Species Act; ESF = Environmental Screening Form; HCP = habitat conservation plan; ITP = incidental take permit; LST = lattice steel tower; mph = miles per hour; O&M = operations and maintenance; PRC = California Public Resources Code; SCE = Southern California Edison; TSP = tubular steel pole; USFWS = U.S. Fish and Wildlife Service; WEAP = Worker Environmental Awareness Program

Source: Data compiled by SCE in 2013

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