

**BURROWING OWL, SWAINSON'S HAWK,
AND NESTING RAPTOR SURVEYS
FOR THE
KINGS RIVER CONSERVATION DISTRICT'S
COMMUNITY POWER PLANT NEAR PARLIER
(FRESNO & TULARE COUNTIES, CALIFORNIA)**

Prepared for

Kings River Conservation District

Att: Mr. Jim Richards
4886 E. Jensen Avenue
Fresno, CA 93725
(559) 237-5567

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Prepared by

HALSTEAD & ASSOCIATES
Environmental / Biological Consultants
296 Burgan Avenue, Clovis, CA 93611
Office (559) 298-2334; Mobile (559) 970-2875
Fax (559) 322-0769; HalsteadEnv@aol.com

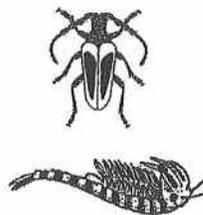
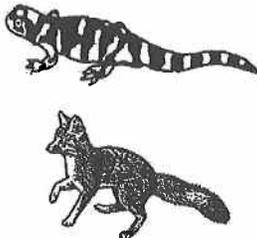


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1. Summary

The KRCD is proposing to construct the KRCD Community Power Plant, a nominal 565 megawatt natural gas power plant east of the City of Parlier in Fresno County, California (Appendix A). The power plant will be constructed on an approximately 32-acre parcel. Additionally, a 20-acre area adjacent to the power plant site will be used for temporary staging and parking during construction. Linear facilities for the project include approximately 5 miles of electrical transmission lines, 5 miles of water pipeline, and 26 miles of natural gas pipeline. The transmission lines, water pipeline, and natural gas pipeline occur in Fresno County, and the gas pipeline also extends to its interconnection point near Visalia in Tulare County, California.

2. Parties Involved

The Kings River Conservation District (4886 E. Jensen Avenue, Fresno, California, 93725, (559) 237-5567) is going through the California Energy Commission's (CEC) licensing process to permit, construct, and operate a power plant and its linear facilities involving natural gas, water, and transmission lines. Navigant Consulting, Inc. (3100 Zinfandel Drive, Suite 600, Rancho Cordova, California, (916) 631-3200) is assisting the KRCD with the permitting of the project. Halstead & Associates, Environmental/ Biological Consultants was hired by KRCD to conduct protocol surveys for the Burrowing Owl, Swainson's Hawk, and nesting raptors and to prepare a report on our findings.

3. Project Location

The 32-acre power plant site and its adjacent 20-acre staging area are located approximately 3 miles southwest of the City of Parlier, Fresno County, California (Appendix A). The location of the power plant site and its staging area, gas pipeline, water pipeline, and transmission lines are listed below, and they are shown on topographic maps in Appendices A.

Power Plant and Staging Area

Section 27 in Township 15 south, Range 22 east, M. D. B. & M., Fresno County.

Gas Pipeline

Sections 27, 28, and 34 in Township 15 south, Range 22 east, M. D. B. & M., Fresno County; Sections 3, 10, 11, and 12 in Township 16 south, Range 22 east, Fresno County; Sections 7 & 8 in Township 16 south, Range 23 east, Fresno County; Sections 17, 20, 19, 21, 29, 28, 32, and 33 in Township 16 south, Range 23 east, Tulare County; Sections 4, 9, 17, 16, 21, 22, 27, and 34 in Township 17 south, Range 23 east, Tulare County; Section 2, 11, 12, 13, and 24 in Township 18 south, Range 23 east, Tulare County; Sections 19, 30, and 31 in Township 18 south, Range 24 east, Tulare County.

Water Pipeline

Sections 2, 3, 10, 11, 16, 22, and 27 in Township 15 south, Range 22 east, M. D. B. & M., Fresno County.

Transmission Lines

Sections 19, 20, 21, 27, and 28 in Township 15 south, Range 22 east, M. D. B. & M., Fresno County; Section 24 in Township 15 south, Range 21 east, Fresno County.

4. Project Description

In summary, the 565 megawatt natural gas power project will be constructed on an approximately 32-acre parcel and an additional 20-acre area of a 60-acre parcel adjacent to the power plant site will be used for temporary staging and parking during construction. Linear facilities for the project include approximately 5 miles of electrical transmission lines, 5 miles of water pipeline, and 26 miles of natural gas pipeline. The project will supply electricity to 13 cities and towns in the local area. The project will not supply electricity for new development that could be growth inducing.

KRCD is currently exercising an option to purchase the proposed power plant site which is approximately 32 acres in size. The site is located in an area currently zoned for agriculture and currently being used predominately for agricultural purposes (vineyards). Existing structures on the power plant site include a vacant rural dwelling, detached garage, and an old barn. Additionally, a 20-acre area of a 60-acre parcel to the northwest of the power plant site will be used for temporary staging and parking during construction. That land is an actively farmed alfalfa field. Primary access to the power plant site will be provided via a paved entrance from South Bethel Avenue.

The power plant site is non-native land that is an actively farmed vineyard (Appendix B). The current land use for the power plant site and construction staging area is agriculture, both being actively farmed. No habitat is present for sensitive species or habitats. The rows between the vines are plowed, and the area underneath the vines is sprayed to control weeds. In addition to vines, the properties possess a few non-native weedy grasses and forbes in the vineyards. The land use surrounding the power plant site includes a closed county landfill to the east, the City of Parlier Waste Water Treatment Plant (WWTP) to the north and agricultural areas to the south and west (Appendix B). The surrounding land has been leveled and developed, actively farmed, and provides no habitat for sensitive species or habitats.

Fuel for the power project will be natural gas supplied from a new approximately 26-mile long, 20-inch underground pipeline interconnection to the Southern California Gas Company's Line 7000 near the City of Visalia, California (Appendix A). The gas pipeline closely follows existing road right-of-way corridors and will be located in the public right-of-way. The gas pipeline will cross under two sensitive areas including the Kings River near the City of Kingsburg and Cross Creek south of the City of Traver. Five construction staging areas have also been identified for use during construction of the gas pipeline, each with an approximate size of 200 feet by 200 feet. These five areas are agricultural lands with no habitat for sensitive species or habitats.

Electric transmission for the power project will be provided by a new interconnection from the power plant site to the Pacific Gas and Electric Company's McCall Substation located on the west side of Leonard Avenue and north of Manning Avenue (Appendix A). A new approximately five mile-long, 230-kilovolt radial transmission line will connect the power plant to the McCall Substation. The transmission line will cross both private property and the public right-of-way. Land use associated with the transmission line is agricultural and sparse residential. The transmission line will cross over and towers will be located in a water recharge basin known as the Manning Recharge Basin. The basin has sparse, low quality wetland habitat.

The primary source of process makeup water for the power plant will be recycled water delivered by new underground pipeline interconnections to the Parlier WWTP and the Sanger WWTP effluent percolation and evaporation ponds located on Lincoln Avenue (i.e., Lincoln Ponds) (Appendix A). The Parlier WWTP is located adjacent to the north of the plant site, and the interconnection will be located at the northern plant site boundary. The proposed interconnection to the Lincoln Ponds is approximately five miles north and will be located primarily along existing roadways. Currently two options are being considered for the water pipeline interconnection to Lincoln Ponds (i.e., Water Supply Pipeline Option 1 and Option 2). Both potential routes will be located primarily along roadways. These roadways are maintained and occur among agricultural land with no habitat for sensitive species or habitats. Up to four new wells recovering percolated effluent will provide a back-up cooling water supply.

Potable water for domestic use will be supplied by a new groundwater well to be installed on the power plant site. There is no offsite linear associated with the potable water supply. Domestic wastewater will be discharged to the Parlier WWTP. The sewer interconnection is located on the northern boundary of the power plant site with no offsite linear.

5. Project Site Description

The proposed power project is located in the southern San Joaquin Valley near the City of Parlier in Fresno County, California. The natural gas pipeline for the project extends south into Tulare County near the City of Visalia. The general region has been developed into agricultural crops and urban and rural developments. This location is within the 1.2 million acre KRCD service territory covering portions of Fresno, Kings and Tulare Counties. The region's climate is Mediterranean, characterized by hot, dry summers and cool wet winters. Summer temperatures frequently exceed 100 degrees Fahrenheit, while winter temperatures are generally mild, with few freezing days per year. Rainfall averages 12 inches per year, with the wettest months between November and March. A regional overview map is presented in Appendix A.

Power Plant Site and Construction Staging Area

The 32-acre power plant site and its 15-acre construction staging area have been previously leveled, converted to agriculture. The proposed power plant site is an actively farmed vineyard. The staging area is an actively farmed alfalfa field. The areas possess a few non-native weedy grasses and forbes which have grown between rows or field edges. No habitat exists for sensitive species and thus none occur on the power plant site or its staging area. No sensitive habitats (such as wetlands, vernal pools, streams, creeks) were identified during field surveys,

and none occur on the power plant site or its staging area. Soils in the area are sandy and no evidence of vernal pool wetlands (depressions or swales, hydrology, or vegetation) occur on the power plant site or its staging area. Lands surrounding the power plant site and its staging area are agricultural, sparse residential, a WWTP, and a closed landfill which provide no habitat for sensitive species or habitats.

Natural Gas Pipeline

The proposed natural gas pipeline will be primarily located in the shoulders of existing roads, just off the paved surface. Road shoulders along the route are graded and sprayed bare with herbicide as part of routine right-of-way maintenance and agricultural practices. Five natural gas pipeline construction lay down sites are planned along the route in existing agricultural equipment areas (Appendix A). These lay down sites are routinely sprayed with herbicide and are nearly void of vegetation. The gas pipeline route provides no habitat for sensitive species or habitats except for two potentially sensitive areas at the Kings River near Kingsburg and Cross Creek south of Traver.

The Cross Creek area has six intermittent drainages, some of which are wetlands and some are waters. Private lands adjacent to the gas pipeline route in the Cross Creek area have non-native annual grassland habitat, wetland ponds, vernal pool wetlands, and the endangered Vernal Pool Tadpole Shrimp. The Kings River at the gas pipeline route is a waters and has wetland and riparian habitat along its banks. Burrows of the California Ground Squirrel were observed along and adjacent to the roadway in the Cross Creek area. Such burrows are potential habitat for species like the San Joaquin Kit Fox, Burrowing Owl, and California Tiger Salamander.

Transmission Line

Land use along the proposed transmission line route is mainly farmland with sparse residential areas. The land along most of the proposed transmission line route is non-native, and has been previously converted to agricultural or residential use. No sensitive species or habitats (except for the Manning Recharge Basin noted below) were observed or occur along the transmission line route. North of Manning Avenue between McCall and Indianola Avenues, the transmission line crosses a groundwater recharge basin known as the Manning Recharge Basin (Appendix A). Plans for the construction of the transmission line call for the placement of transmission poles within this basin. A wetland and waters evaluation was conducted at the Manning Recharge Basin. In summary, the recharge basin has sparse, low quality wetland habitat in its bed and its banks have upland habitat. Burrows of the California Ground Squirrel were observed in and around the recharge basin. Such burrows are potential habitat for species like the San Joaquin Kit Fox and Burrowing Owl.

Water Pipeline

The proposed water supply pipeline (Option 1 and Option 2) will be constructed along road shoulders running north from the power plant site. Road shoulders along the route are graded and sprayed with herbicide as part of routine right-of-way maintenance and agricultural practices. Plant species observed during site visits are consistent with the plant species observed on road shoulders along the gas pipeline route. The land along the proposed water pipeline route

(Option 1 and Option 2) is non-native, and has been previously converted to agricultural or residential uses. No habitat for sensitive species exists in these areas and thus none occur along the route. Also, no sensitive habitats (such as wetlands, vernal pools, streams, and creeks) occur along the proposed water pipeline route. Land use associated with both pipeline options is agriculture. Land use surrounding the Parlier WWTP is primarily agriculture. The Parlier WWTP property is cleared of vegetation and provides no habitat for sensitive species. Lincoln Ponds are used to percolate treated wastewater into the soil, and are disked once the area has dried. There will be no impacts to sensitive species and no sensitive habitats (such as wetlands, vernal pools, streams, and creeks) will be impacted along the proposed water pipeline (Option 1 and Option 2).

Potable Water and Domestic Sewer Supply

There are no offsite linears associated with the potable water and domestic sewer supply. The description of the power plant site and its construction staging area also applies to the potable water and sewer connection. There will be no impacts to sensitive species or habitats associated with these interconnections.

6. Previous Surveys and Informal Consultation

Nesting raptor surveys have not been previously conducted on the site. Informal consultations have occurred with resource or regulatory agencies about the project and required surveys. This protocol survey was proposed in the Biological Assessment report (November 2007) as a preventive avoidance measure for the project.

7. Regulatory Overview

To ensure the long-term protection of raptors and their habitats, a variety of laws and regulations have been implemented through multiple environmental protection Acts, which include:

National Environmental Policy Act (42 U.S.C. 4321 et seq.);
Federal Endangered Species Act (16 U.S.C. 1531-1543);
Fish and Wildlife Coordination Act (16 U.S.C. 661-666);
California Environmental Quality Act (P.R.C. 21000 et seq.);
California Endangered Species Act (California Fish and Game Code 2050 et seq.);
Fish and Wildlife Protection and Conservation (California Fish and Game Code);
Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-711); and
Bald and Golden Eagle Protection Act (16 USC 668).

Implementation and regulation of these Acts has been delegated to several state and federal agencies. The following section briefly describes the regulation and which, if any, agency governs.

Special-Status Species

Special-status plant and wildlife species are species that have been afforded special

recognition and protection by federal, state, or local resource conservation agencies and organizations. These species are generally considered rare, threatened, or endangered due to declining or limited populations. Special-status species include:

Animals that are legally protected or proposed for protection under the California Endangered Species Act (CESA) or Federal Endangered Species Act (FESA);

Animals defined as endangered or rare under the California Environmental Quality Act (CEQA) (Section 15380);

Animals designated as species of special concern by the U. S. Fish and Wildlife Service (USFWS) or CDFG;

Animals listed as “fully protected” in the Fish and Game Code of California (Sections 3511, 4700, 5050, and 5515); and

Federal Endangered Species Act

The Federal Endangered Species Act of 1973 (Act) recognized that many species of fish, wildlife, and plants are in danger of or threatened with extinction and established a national policy that all federal agencies should work toward conservation of these species. The Secretary of the Interior and the Secretary of Commerce are designated in the Act as responsible for identifying endangered and threatened species and their critical habitats, carrying out programs for the conservation of these species, and rendering opinions regarding the impact of proposed federal actions on endangered species and specifies civil and criminal penalties for unlawful activities.

Biological assessments are required under Section 7 of the Act if listed species or critical habitat may be present in the area affected by any major construction activity conducted by, or subject to issuance of a permit from, a federal agency as defined in Part 404.02. Under section 7(a)(3) of the Act, every federal agency is required to consult with the USFWS or U. S. National Marine Fisheries Service on a proposed action if the agency determines that its proposed action may affect an endangered or threatened species.

Section 9 of the Endangered Species Act prohibits the “take” of any fish or wildlife species listed under the FESA as endangered or threatened. Take, as defined by the FESA, means “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such action.” However, Section 10 allows for the “incidental take” of endangered and threatened species of wildlife by non-Federal entities. Incidental take is defined by the FESA as take that is “incidental to, and not the purpose of, the carrying out of an otherwise lawful activity.” Section 10(a)(2)(A) requires an applicant for an incidental take permit to submit a “conservation plan” that specifies, among other things, the impacts that are likely to result from the taking and the measures the permit applicant will undertake to minimize and mitigate such impacts. Section 10(a)(2)(B) provides statutory criteria that must be satisfied before an incidental take permit can be issued.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703-711) makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 CFR Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 CFR 21).

Bald and Golden Eagle Protection Act

Specifically protects Bald and Golden Eagles from harm or trade.

California Endangered Species Act

The California Endangered Species Act (Fish and Game Code Sections 2050-2098) established a State policy to conserve, protect, restore, and enhance any endangered species or any threatened species and its habitat. The Fish and Game Commission is charged with establishing a list of endangered and threatened species. State agencies must consult with the California Department of Fish and Game (CDFG) to determine if a proposed project is likely to jeopardize the continued existence of any endangered or threatened species.

Section 2081 of the Fish and Game Code allows the “take” of a species listed as threatened or endangered by the California Endangered Species Act. Take is defined as any act that involves direct mortality or other actions that may result in adverse impacts when attempting to take individuals of a listed species. Under Section 2081, the CDFG may issue a permit to authorize take for scientific, educational or management purposes, or take that is incidental to otherwise lawful activities.

California Fish and Game Code

Section 3503. 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. Protects all birds-of-prey and their eggs and nests.

Section 3513. Makes it unlawful to take or possess any migratory non-game bird as designated in the Migratory Bird Treaty Act.

Title 14, California Code of Regulations, Sections 670.2 and 670.5

Lists animals designated as threatened or endangered in California. California Species of Concern (CSC) is a category designated by CDFG for species considered to be indicators of regional habitat changes, or candidate species for future state listing. CSC do not have special legal status, but are used by CDFG as a management tool when considering the future use of any land parcel.

Significance Criteria

The CEQA Guidelines in its Appendix G provides guidance for assessing the significance of potential environmental impacts. Relative to biological resources, a project will normally have a significant effect on the environment if it will:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFG or USFWS.
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

8. Background Information on the Burrowing Owl

The Burrowing Owl is a state Species of Concern and is protected by a variety of laws as noted in Section 7. Life information on the Burrowing Owl is presented in Appendices D and E. In summary, the Burrowing Owl occurs throughout most of California. The owl is active during the day and feeds upon insects, lizards, and small mammals. The owl nests in vacant underground burrows of the California Ground Squirrel, Coyote, San Joaquin Kit Fox, and Badger. The owl commonly occurs in rolling hills of nonnative grasslands of the valley floor, fallow fields, and banks of canals, railroads, and agricultural land. Burrowing Owl populations have declined due to habitat loss.

9. Background Information on the Swainson's Hawk

The Swainson's Hawk is a state Threatened species is protected by a variety of laws as noted in Section 7. Life information on the Swainson's Hawk is presented in Appendices F and G. In summary, the Swainson's Hawk breeds throughout the western half of the United States and Canada, and winters in South America. The hawk was once found throughout lowland California and were absent only from the Sierra Nevada, north coast ranges, Klamath Mountains, and portions of the desert region of the state. Today, the hawk is restricted to portions of the Central Valley and Great Basin region of the State where suitable habitat occurs. The hawk occurs in open grasslands in association with mature riparian forests, lone trees, groves of oaks, or mature road-side trees proximate to agricultural fields. The nest is a platform of sticks. Suitable foraging areas include native grasslands or lightly-grazed pastures, alfalfa and other hay crops, and certain grain and row croplands. Unsuitable habitats include vineyards, orchards, rice, corn, and cotton crops. Diet consists mainly of the California Vole, but a variety of birds and insects are also consumed. The Swainson's Hawk populations have declined due to conversion of the Central Valley and other grassland areas from pastureland to cropland. Also, unproven factors such as pesticide contamination and habitat deterioration on their South American wintering grounds may also be causes. Human disturbance at nest sites and shooting have also contributed.

10. Survey Methods

Protocol surveys were conducted by Pamela Halstead, Jeffrey Halstead, and field

biologist Andrew Roberts to determine if the Burrowing Owl, Swainson's Hawk, and nesting raptors occur on or adjacent to the project site, use the site as foraging habitat, and could be impacted by the project. The survey protocol of the Burrowing Owl Consortium (Appendix I) was reviewed, planned, and conducted for the project to assess Burrowing Owl occurrence on and adjacent to the project site. The survey protocol of the Swainson's Hawk Technical Advisory Committee (Appendix K) was reviewed, planned, and conducted for the project to assess Swainson's Hawk occurrence on and adjacent to the project site. Also, the mitigation guidelines of the CDFG for the Burrowing Owl and Swainson's Hawk in Appendices H and J, respectively were reviewed. High powered binoculars were used to search for nests, and locate and identify birds. Survey information was recorded on standardized data sheets for each survey date. Aerial photographs were used to locate on-the-ground field positions, potential nesting trees, and suitable habitats.

Burrowing Owl Surveys

The protocol survey requires both breeding and wintering surveys for the owl. Two breeding surveys are required in each of March and April. Two wintering surveys are required in each of December and January. Additional surveys are required if owl nesting is observed. Surveys were conducted as specified in the protocol guidelines (Appendix I) and were conducted on December 28 and 31 of 2007, January 18 and 25, March 17 and 28, April 10, 14, and 28, and May 2 of 2008. Extra surveys were conducted on April 28 and May 2 as we were already in the field conducting hawk surveys. The entire project site and adjacent lands were visually surveyed by driving, walking, and/or viewing the area. Special survey emphasis was conducted for the Cross Creek area and the Manning Recharge Basin. Burrows of the California Ground Squirrel and Coyote were examined for evidence of owl use (such as feces, prey remains, tracks, feathers). These burrows were considered "potential" Burrowing Owl burrows and were checked each time during the surveys. Examples of such potential burrows were photographed and are shown in Appendix C.

Swainson's Hawk Surveys

The protocol survey requires a winter survey to locate nests in trees and breeding surveys for the hawk. The winter survey is required in January when trees are leafless and large nests are easy to locate. Two breeding surveys are required in March and four in April. Additional surveys are required if hawk nesting is observed. Surveys were conducted as specified in the protocol guidelines (Appendix K) and were conducted on January 18, 25, and 28, February 6, March 17 and 28, April 10, 14, and 28, and May 2 of 2008. Survey exceptions to the guidelines involve a couple extra surveys were conducted in January, and one of the April surveys was conducted in May. The extra surveys were conducted as we were already in the field conducting owl surveys. The entire project site and adjacent lands were visually surveyed by driving, walking, and/or viewing the area (Appendix A). To locate potential hawk and raptor nests, trees were viewed with high power binoculars. Nests were plotted on aerial photographs, given a reference number, their general size, height, and tree type noted; and they were checked each time during the surveys. Examples of such potential nests were photographed and are shown in Appendix M.

Nesting Raptor Surveys

During the surveys for the Burrowing Owl and Swainson's Hawk, we searched for nests

of raptors and nesting raptors themselves. Data as noted for the Swainson's Hawk survey were noted for raptor nests. Surveys were conducted on December 28 and 31 of 2007, and January 18, 25, and 28, February 6, March 17 and 28, April 10, 14, and 28, and May 2 of 2008.

11. Survey Results

The scientific literature and CDFG's Natural Diversity Data Base shows that Burrowing Owl, Swainson's Hawk, and nesting raptors are known to occur in the general region of the site. Protocol surveys were conducted for the raptors and findings are presented below.

Burrowing Owl

No Burrowing Owls were observed on or adjacent to the project site during the surveys. No potential burrows on or adjacent to the project site showed any evidence of use by the Burrowing Owl.

Swainson's Hawk

One Swainson's Hawk (dark phase) was observed on April 11, 2008 siting an American Crow (crow) nest in the median of Highway 99 near Cross Creek. This hawk was only observed once and did not nest on or adjacent to the project site.

Nesting Raptors

No nests were found at the power plant, 60-acre staging area, or along the water pipeline routes. Several raptor and crow nests were located along the gas and transmission line routes (Appendices L and M). Such nest of raptors include Red-tailed Hawk and Great-horned Owl. The nests are mapped in Appendix L and described in Appendix M. Several nests were located, mapped, and monitored, but no bird or nesting use occurred (Appendix M).

12. Conclusions

No nests of sensitive raptors such as Burrowing Owl or Swainson's Hawk occur on or adjacent to the project site. Several raptor and potential raptor nests occur along the gas and transmission line routes. These nests will require special attention and the implementation of preventive avoidance measures to avoid impacts. Such measures will avoid all disturbances and potential impacts and thus, no take will occur and mitigation will not be required. If the recommendations below are implemented, sensitive raptor resources will be protected and preserved.

13. Recommendations

This report will be sent to the USFWS, CDFG, and CEC and will be filed with the environmental documents to prove compliance with the California Environmental Quality Act, CEC environmental review process, the Biological Assessment report (November 2007), and other laws. Habitat compensation mitigation should not be required for raptors - as no significant

negative impacts will occur to them. The following preventive measures (preconstruction surveys) are recommended and should be incorporated into the project to avoid any potential impacts to Burrowing Owl, Swainson's Hawk, nesting raptors, and nesting birds. The avoidance measures are described below for each resource.

Burrowing Owl

No Burrowing Owls were found on or adjacent to the project site. However, the owl, its nests, and upland habitat could be negatively impacted by the construction of the project unless preventive avoidance measures are incorporated into the project. To meet CDFG and CEC requirements, the following avoidance measures are proposed, incorporated into the project, and shall be implemented.

- Measure 1. A preconstruction survey shall be conducted by a qualified biologist to determine the existence of Burrowing Owl nesting sites on project construction areas. The survey shall be conducted within 30 days prior to any construction activities for each construction area. Results of the preconstruction survey shall be prepared in a report and given to the CDFG and CEC for their review and approval prior to any construction activities.
- Measure 2. If nesting sites are found, the CDFG's (1994) guidelines for Burrowing Owl "Staff Report on Burrowing Owl Mitigation" shall be consulted and the project proponent shall select one of the following measures for implementation by a qualified biologist.
- a). Destroy vacant burrows prior to March 1 and/or after August 31.
 - b). Redesign the project temporarily or permanently to avoid occupied burrows or nest sites until after the nesting/fledgling season.
 - c). Delay the project until after the nesting/fledgling season (March 1 thru August 31).
 - d). Install artificial burrows in open-space areas of the project site and wait for passive relocation of the Burrowing Owl.
 - e). Active relocation of Burrowing Owl with conditions. The project proponent shall fund relocation of Burrowing Owl to unoccupied, suitable habitat which is permanently preserved (up to 6.5 acres per nesting pair) in the open-space on the project site or off-site at a recognized Burrowing Owl mitigation bank. Details are specified in CDFG (1994).

Swainson's Hawk

No specific avoidance measures are recommended for the Swainson's Hawk beyond those listed below for Nesting Raptors and Birds.

Nesting Raptors and Birds

Nesting birds including raptors and their nests could potentially occur on the project site. Nesting birds and their nests could be negatively impacted by the construction of the project unless preventive avoidance measures are incorporated into the project. To meet CDFG and CEC requirements, the following avoidance measures are proposed, incorporated into the project, and shall be implemented.

- Measure 1. Prior to any construction activities on the project site in the February thru August period, a preconstruction survey shall be conducted by a qualified biologist for nesting birds (which includes migratory birds covered under the Migratory Bird Treaty Act) in project construction areas. The survey will include the project site, and also adjacent lands with emphasis on large trees which have potential for nesting raptors. Results of the preconstruction survey shall be prepared in a report and given to the CDFG and CEC for their review and approval prior to any construction activities.
- Measure 2. If any active nests are observed, the nests shall be designated as an Environmentally Sensitive Area and protected (while occupied) during the construction activities. The CDFG shall be contacted, consulted, and avoidance measures, specific to each incident, shall be developed in cooperation with the project proponent, and a qualified biologist. No birds or their nests (including migratory birds covered under the Migratory Bird Treaty Act) will be impacted and no take will occur.

14. Literature Consulted

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Burrowing Owl.

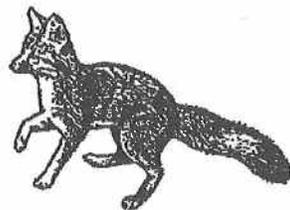
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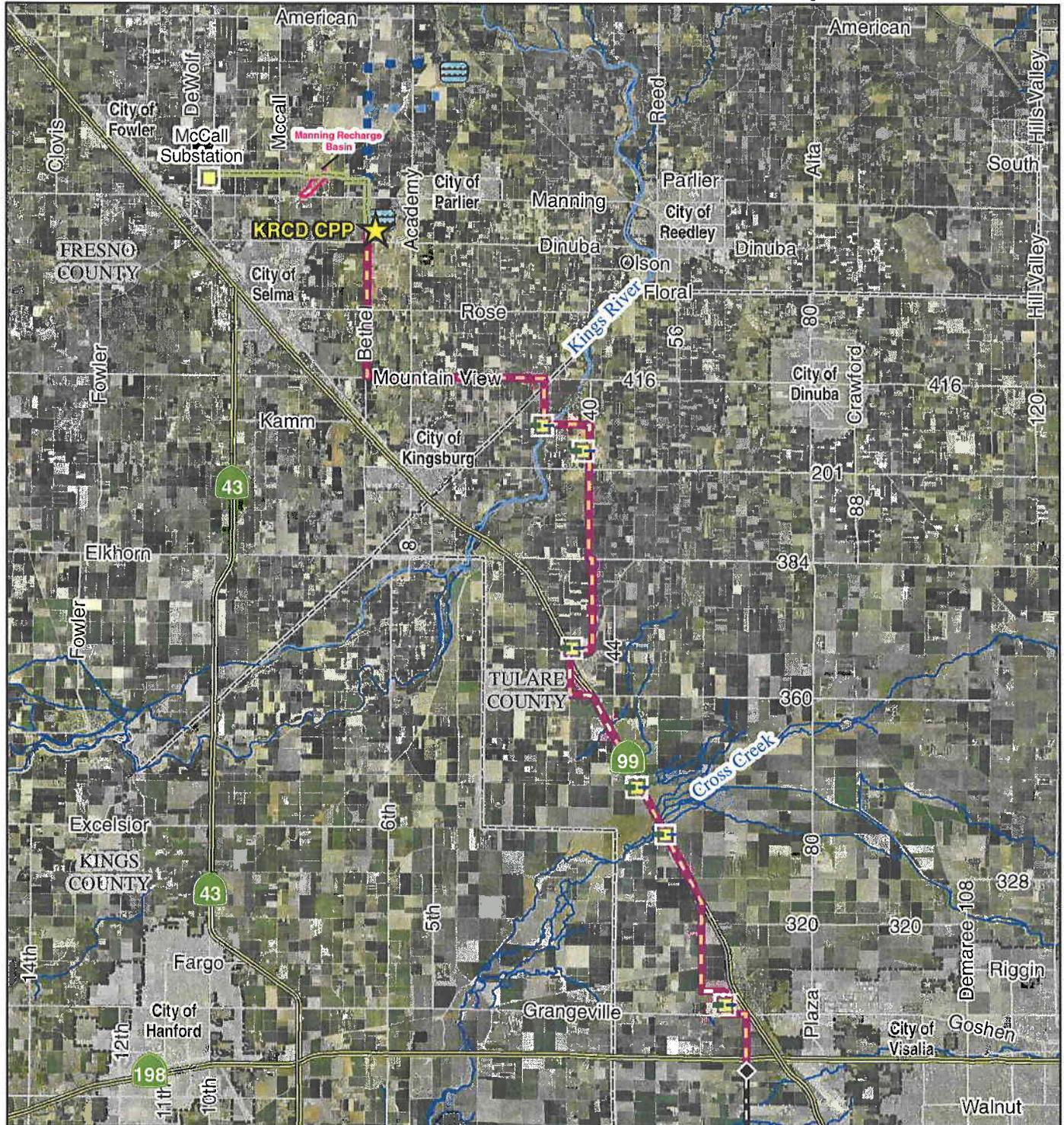
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APPENDIX A

Project Location Maps

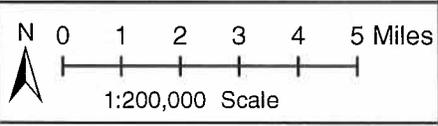


Kings River Conservation District Community Power Plant



- ★ KRCDC Community Power Plant
- Freeway
- Major Street
- City Boundary
- County Boundary Line
- Substation
- Proposed Transmission Line
- Waste Water Percolation Ponds
- Proposed Water Supply Pipeline - Option 1
- Proposed Water Supply Pipeline - Option 2
- ◆ Natural Gas Connection Point
- ⊕ Proposed Natural Gas Staging / HDD Area
- Proposed Natural Gas Pipeline
- SoCal Gas 7000 Line
- Manning Recharge Basin

Power Plant Overview



KRCDC COMMUNITY POWER PLANT

Energy for our Future

Kings River Conservation District Community Power Plant



**KRCD COMMUNITY
POWER PLANT**

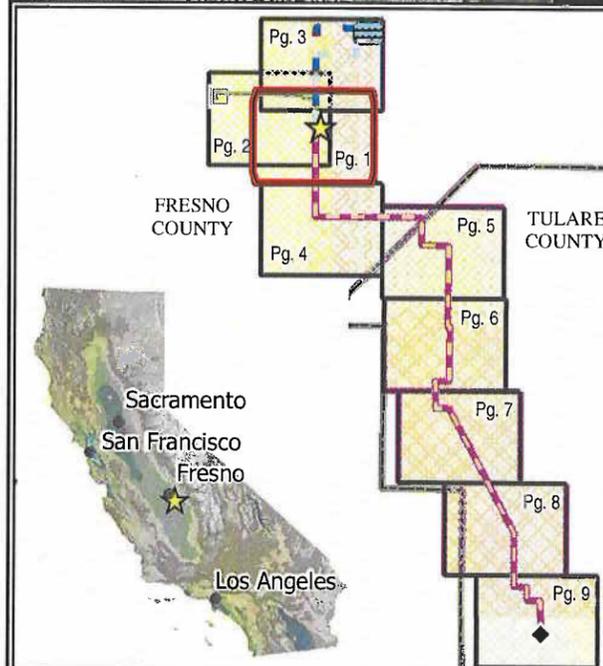
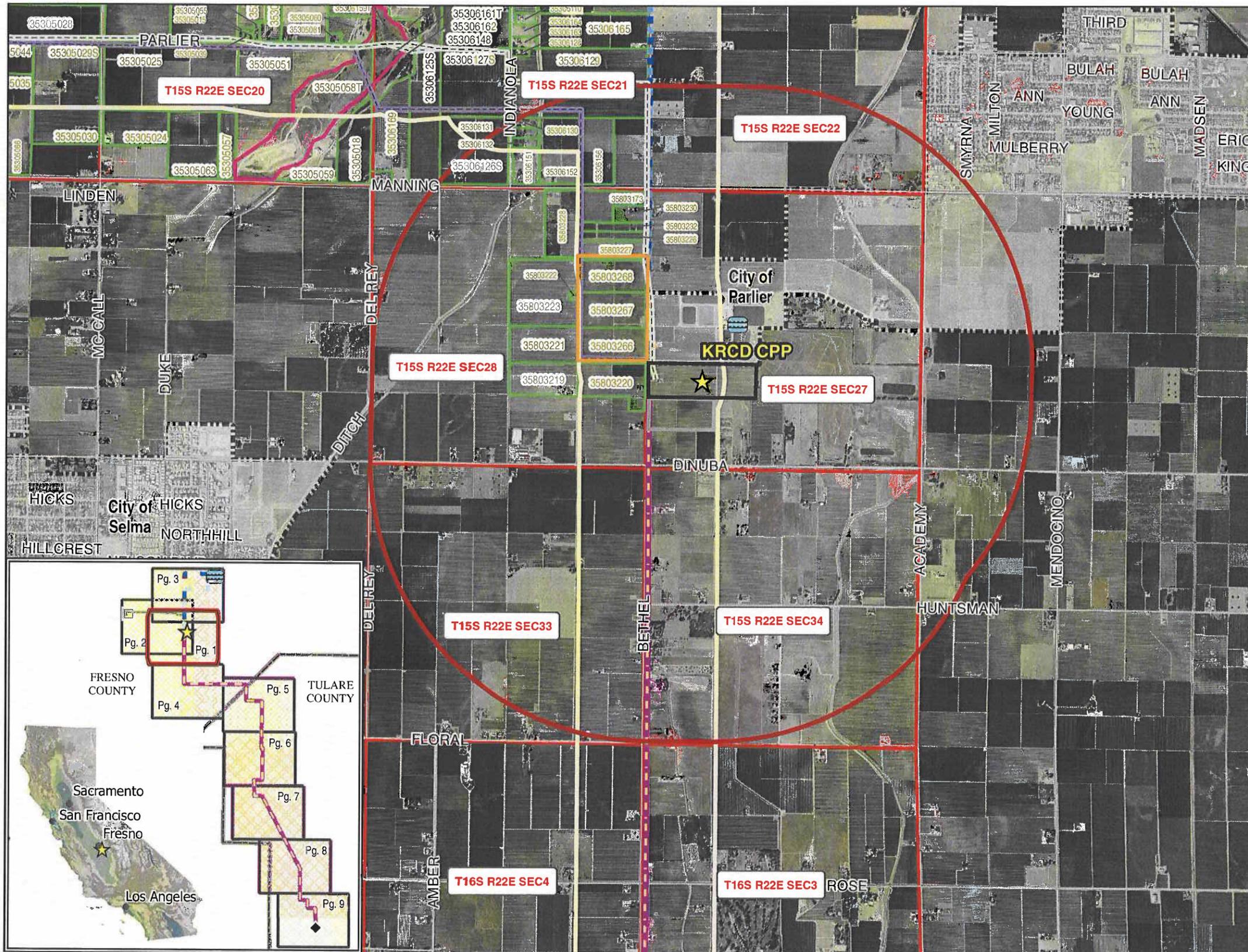
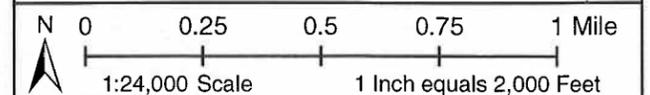
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Project Location Maps

Page: 1 of 9

- KRCD Community Power Plant
- KRCD CPP Project Site
- KRCD CPP Project Laydown (New)
- KRCD CPP Project Laydown (Originally Proposed)
- KRCD CPP Site 1 Mile Buffer
- Linear 1/4 Mile Buffer
- Substation
- Proposed 230KV Transmission Line (New)
- Proposed 230KV Transmission Line (Originally Proposed)
- Waste Water Percolation Ponds
- Proposed Water Supply Pipeline - Option 1
- Proposed Water Supply Pipeline - Option 2
- Manning Recharge Basin
- HDD Bore / Laydown Area
- HDD Bore Span
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- Proposed Natural Gas Laydown Area
- Proposed Natural Gas Pipeline
- SoCal Gas 7000 Line
- Freeway
- Street
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- Parcel
- Section
- Waterway
- County Boundary
- City Boundary

NOTE: Potable Water and Sewer Connections are on the project site.



Kings River Conservation District Community Power Plant

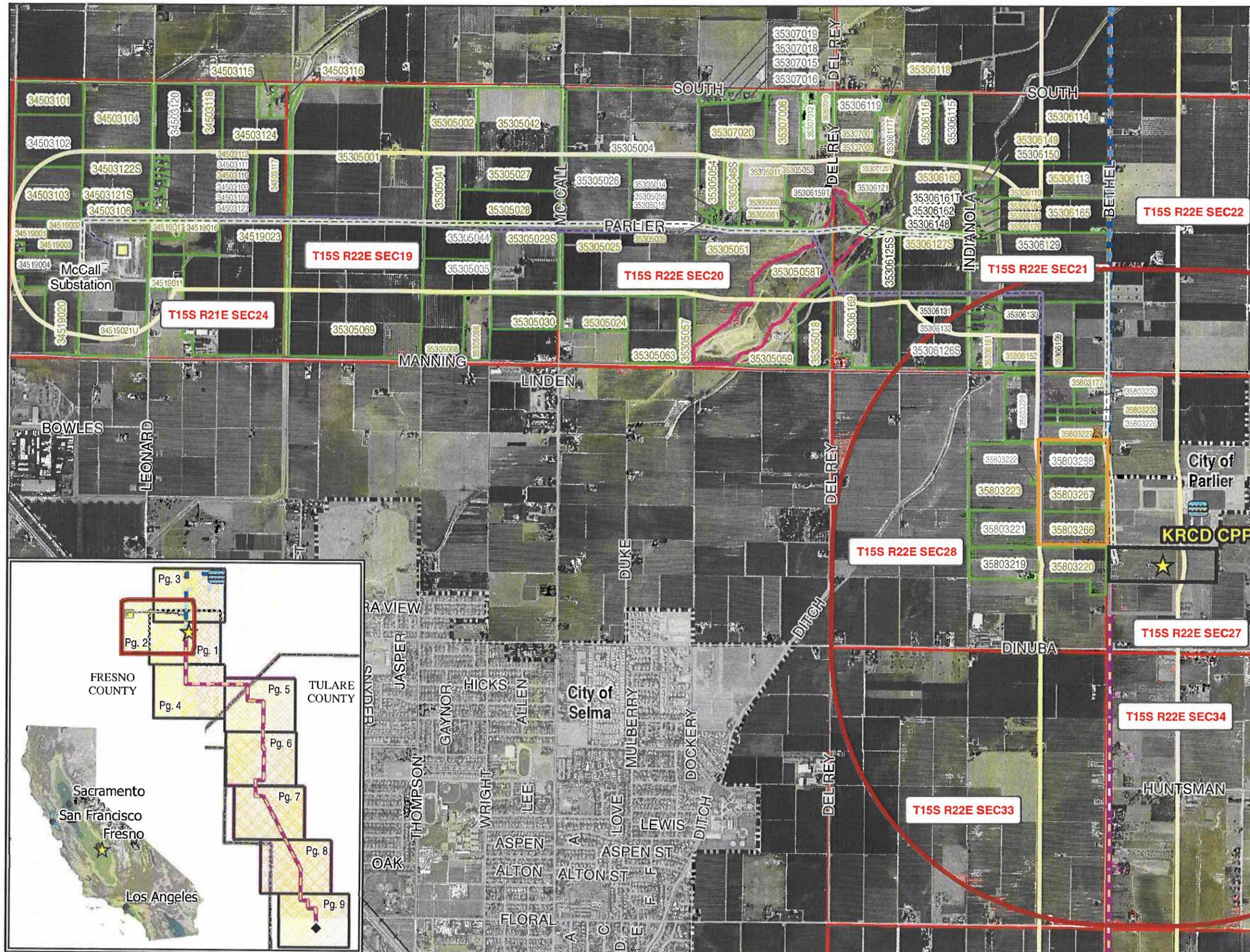


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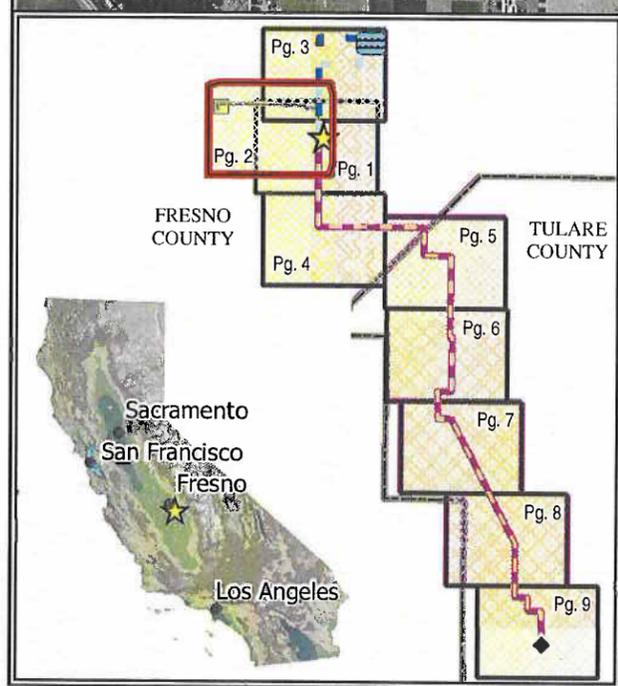
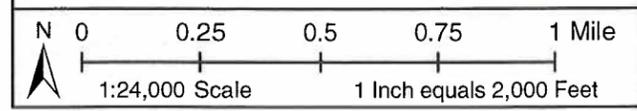
Project Location Maps

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- Proposed Water Supply Pipeline - Option 2
- ☒ Manning Recharge Basin
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Kings River Conservation District Community Power Plant



KRCD COMMUNITY POWER PLANT

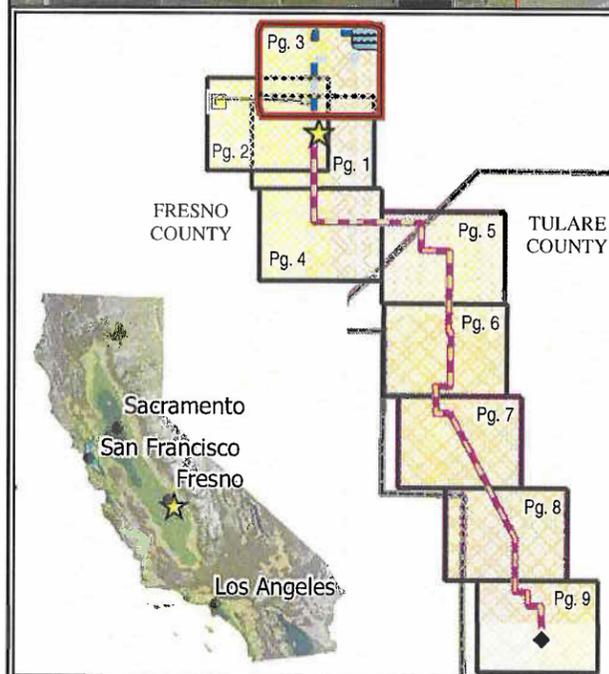
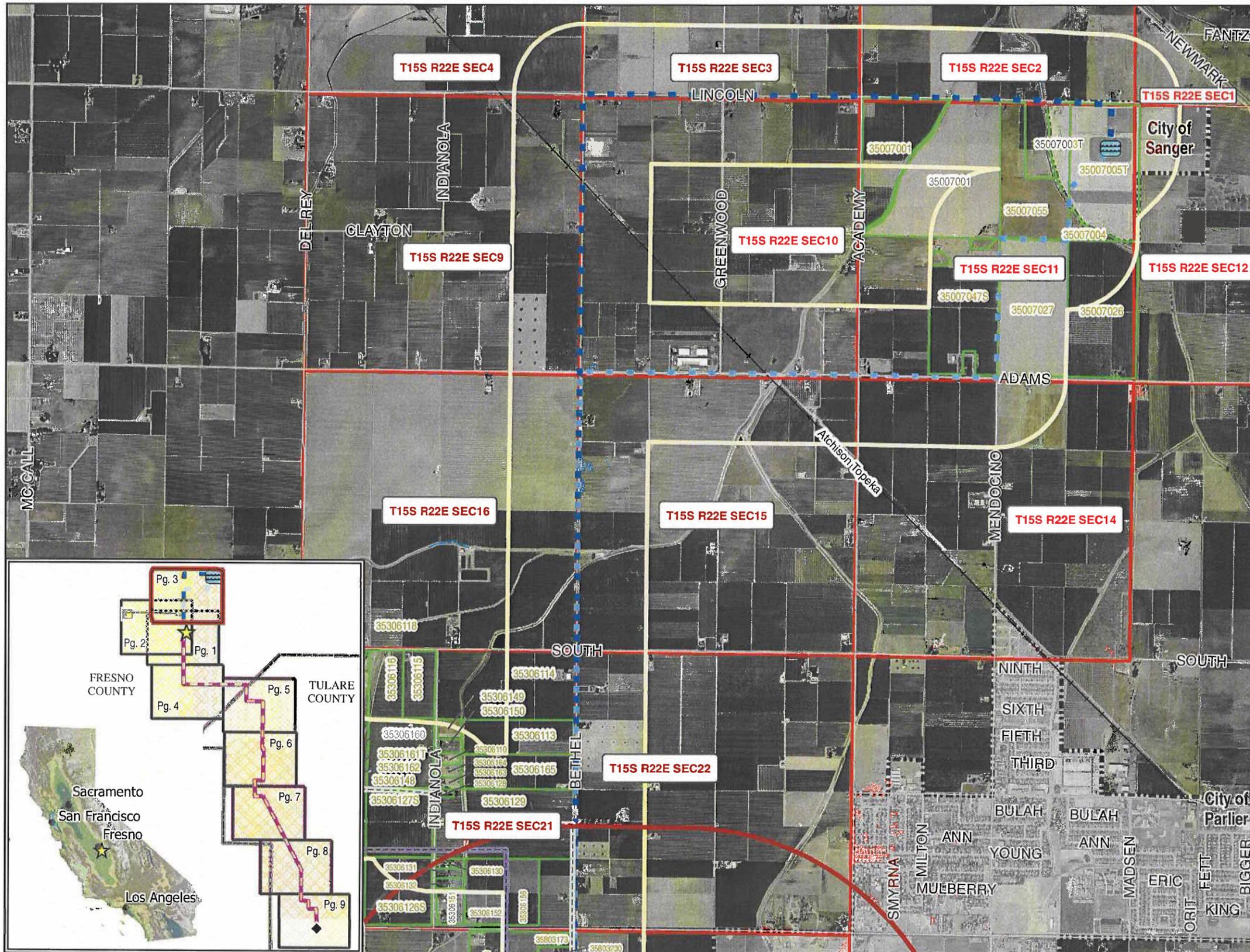
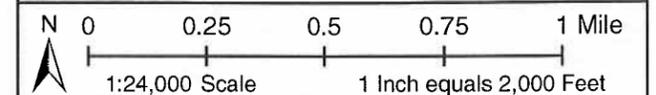
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Project Location Maps

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Kings River Conservation District Community Power Plant



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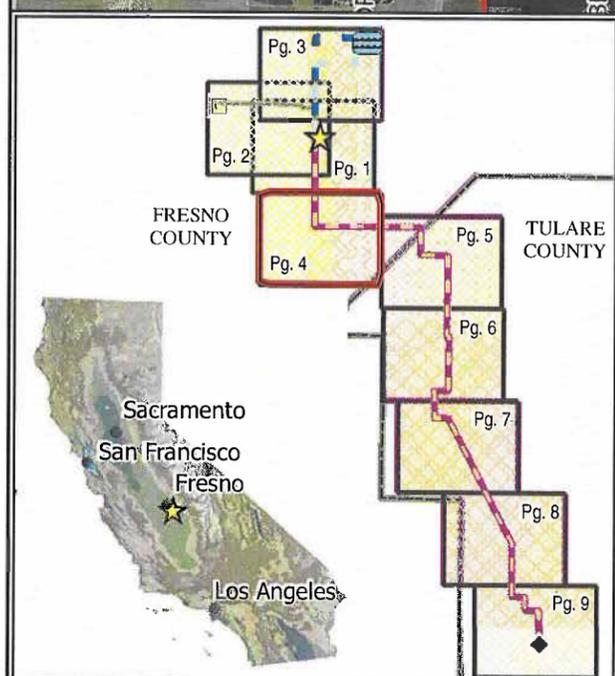
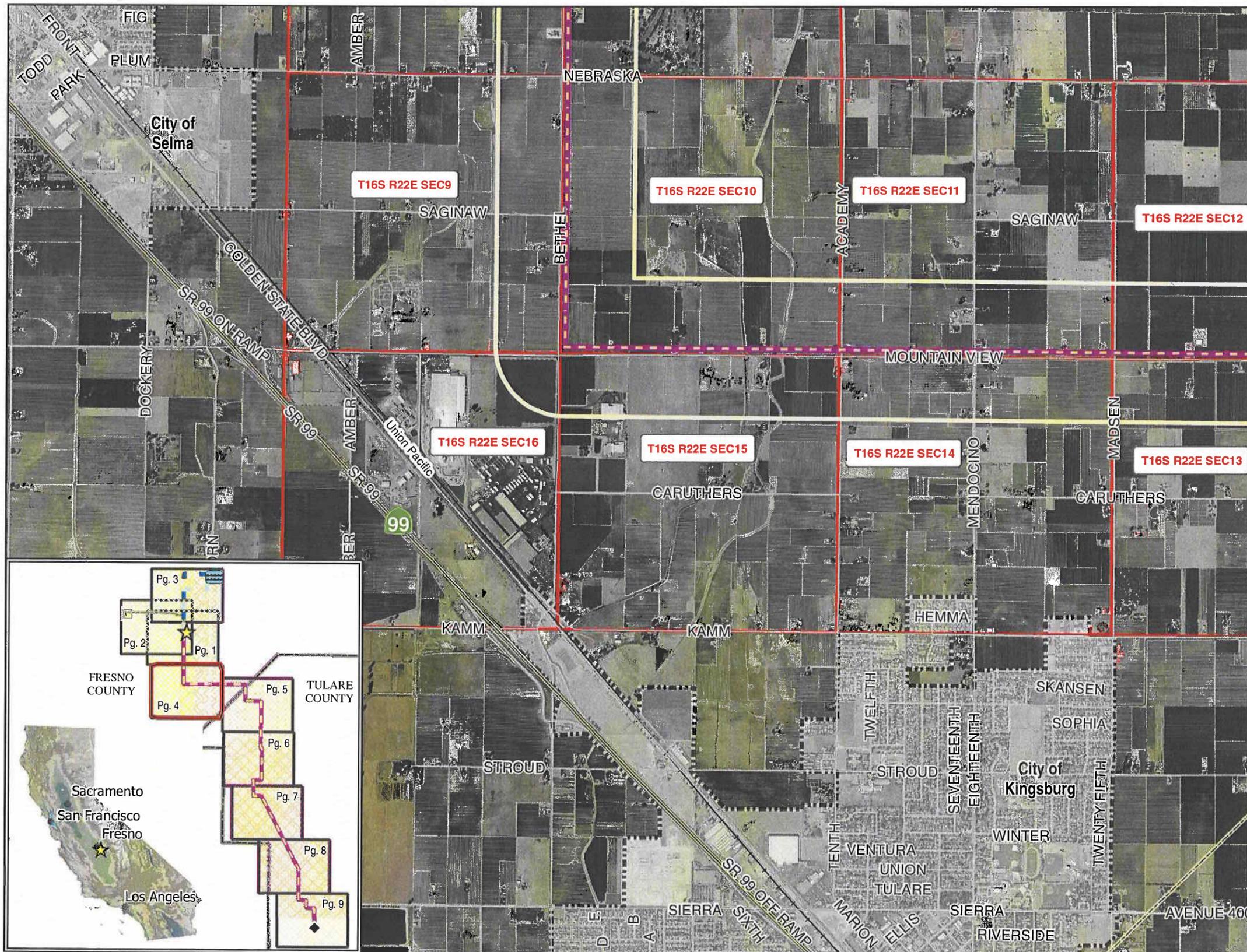
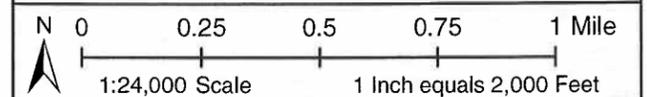
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Project Location Maps

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Kings River Conservation District Community Power Plant



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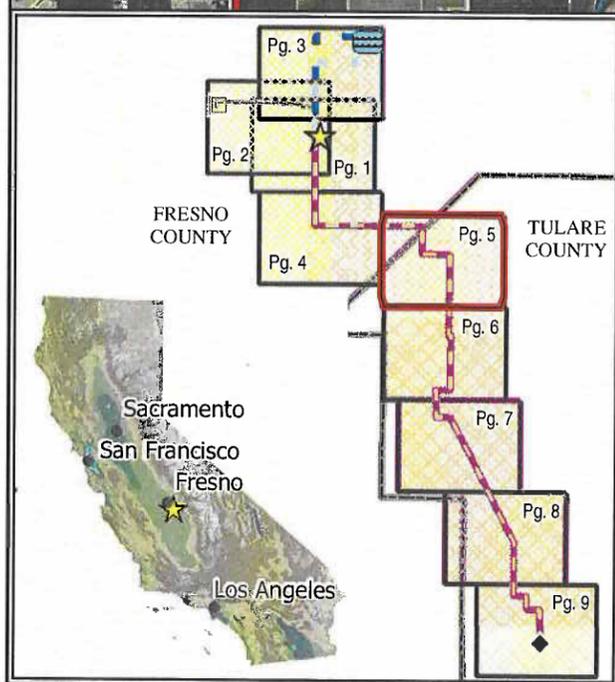
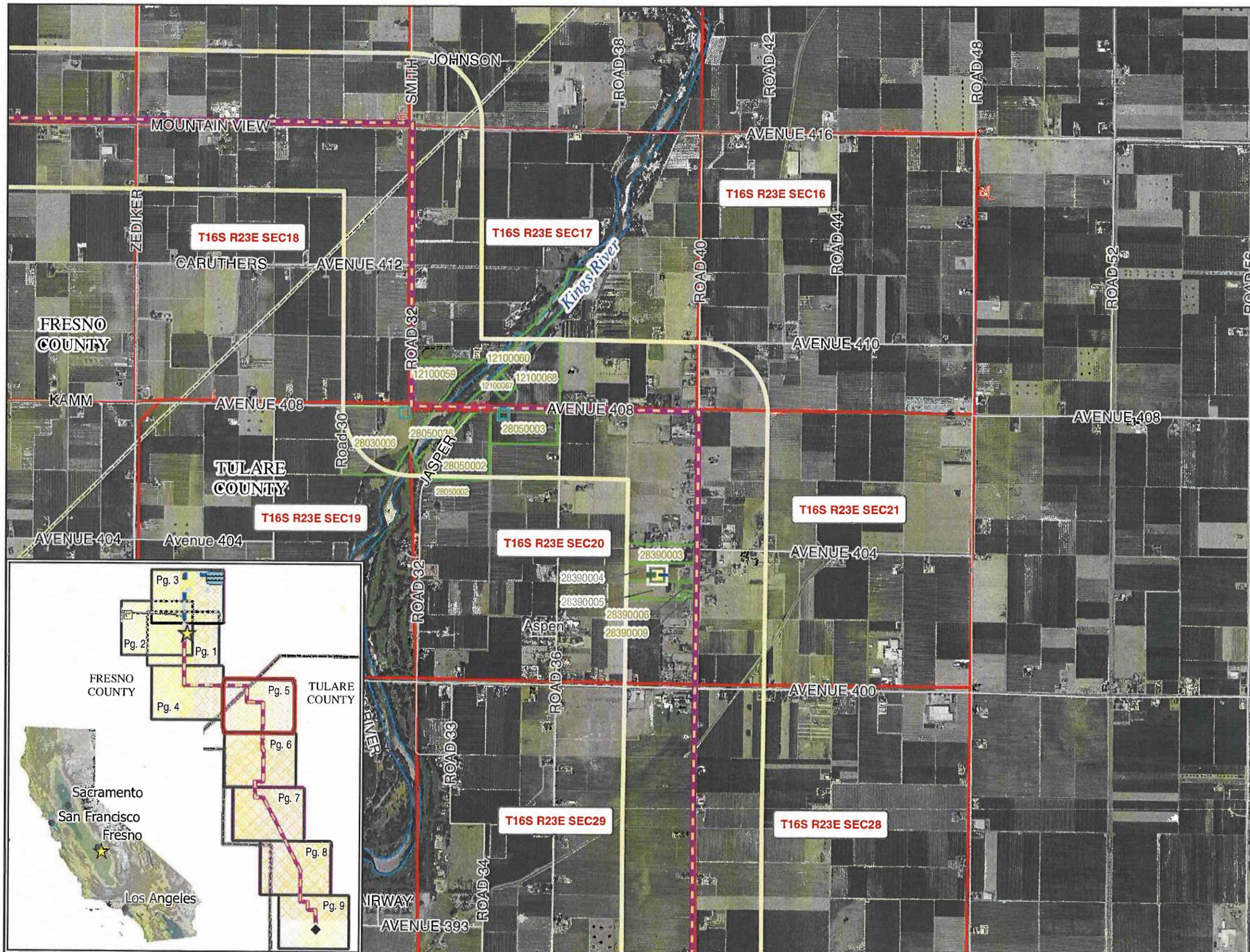
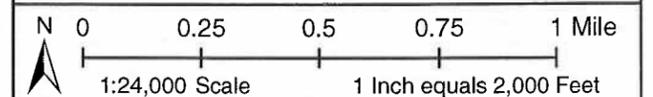
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Project Location Maps

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Kings River Conservation District Community Power Plant



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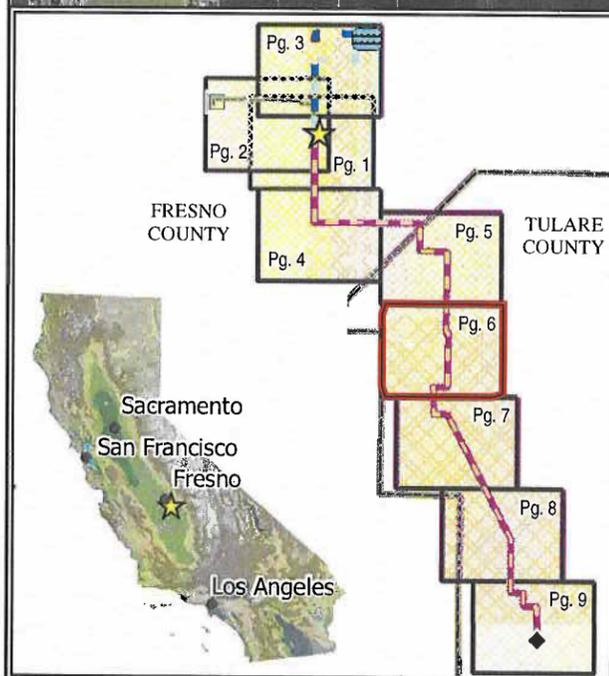
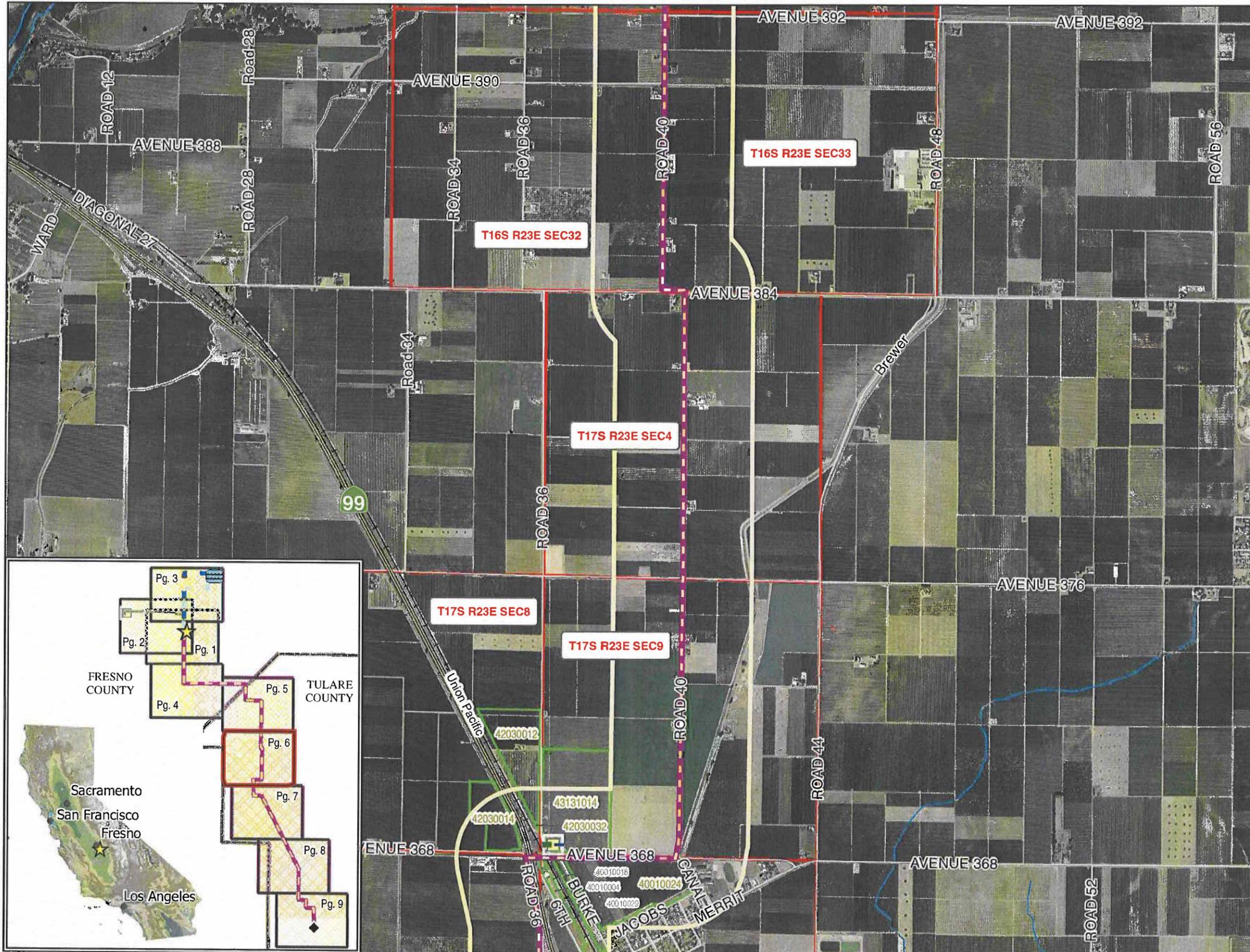
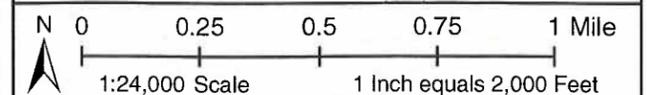
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Kings River Conservation District Community Power Plant



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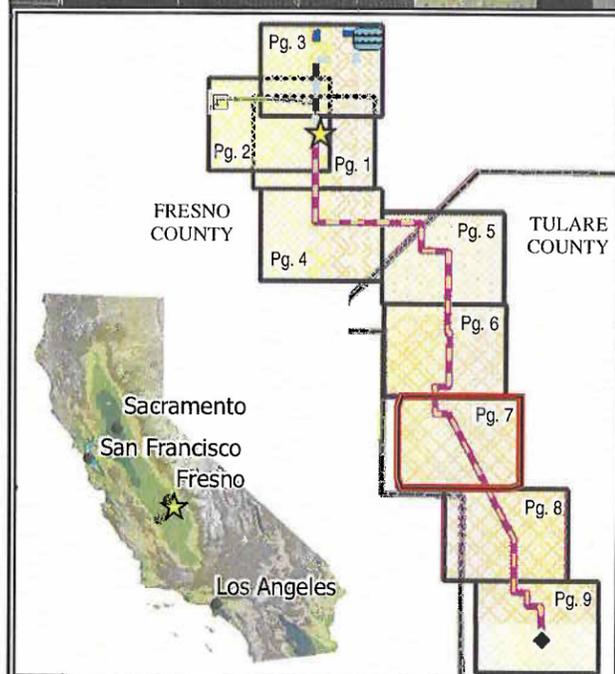
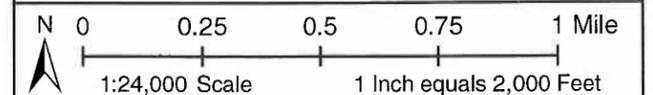
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Project Location Maps

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Kings River Conservation District Community Power Plant

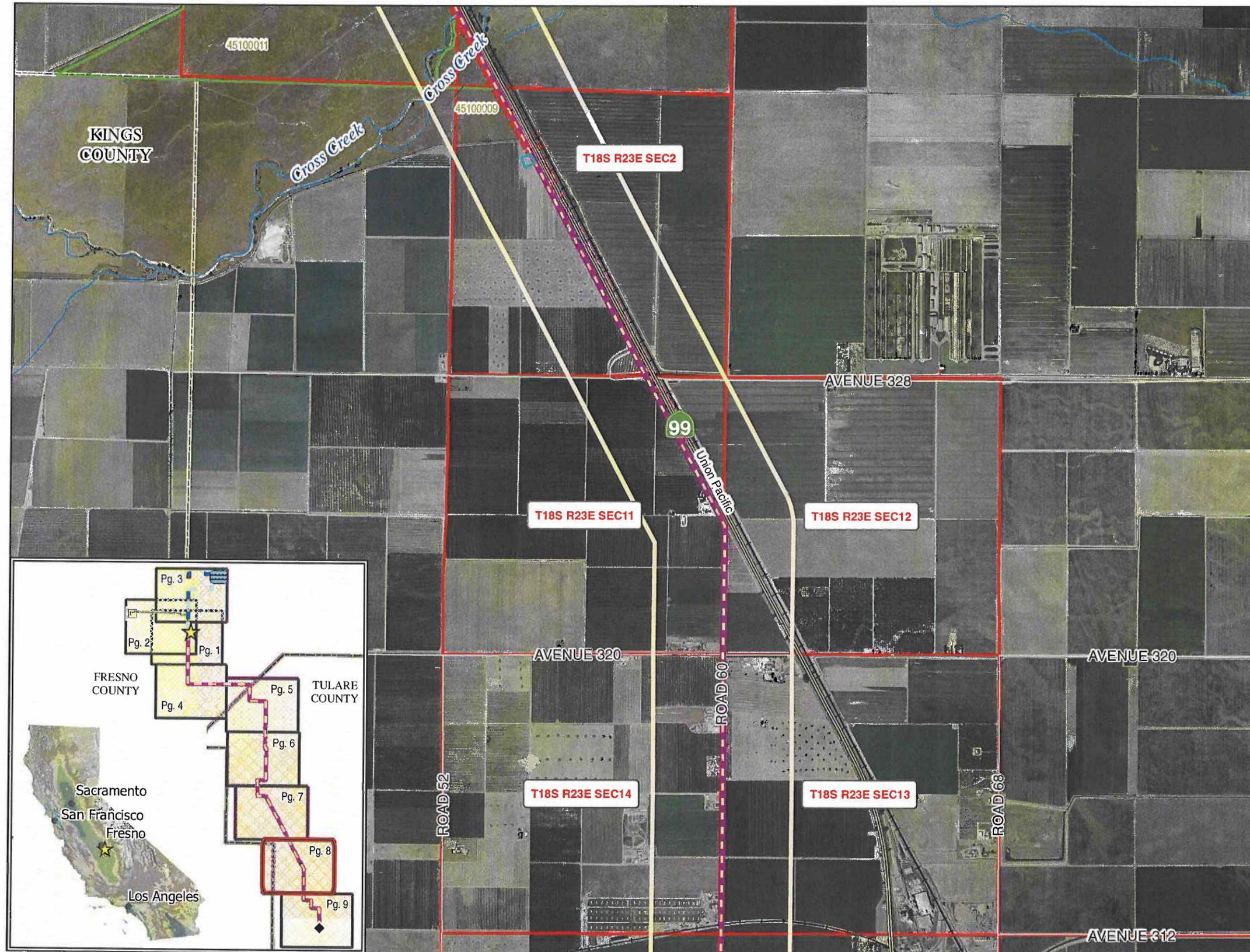


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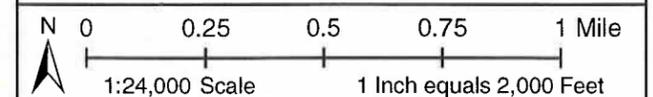
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Kings River Conservation District Community Power Plant



KRCD COMMUNITY POWER PLANT

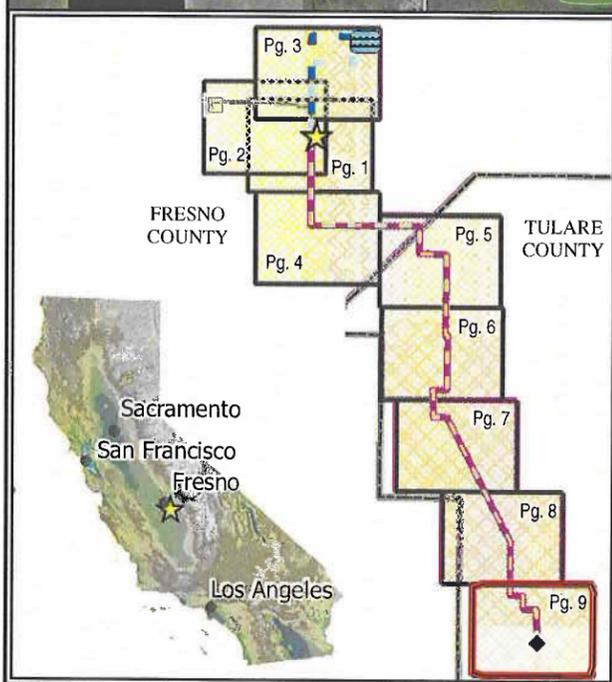
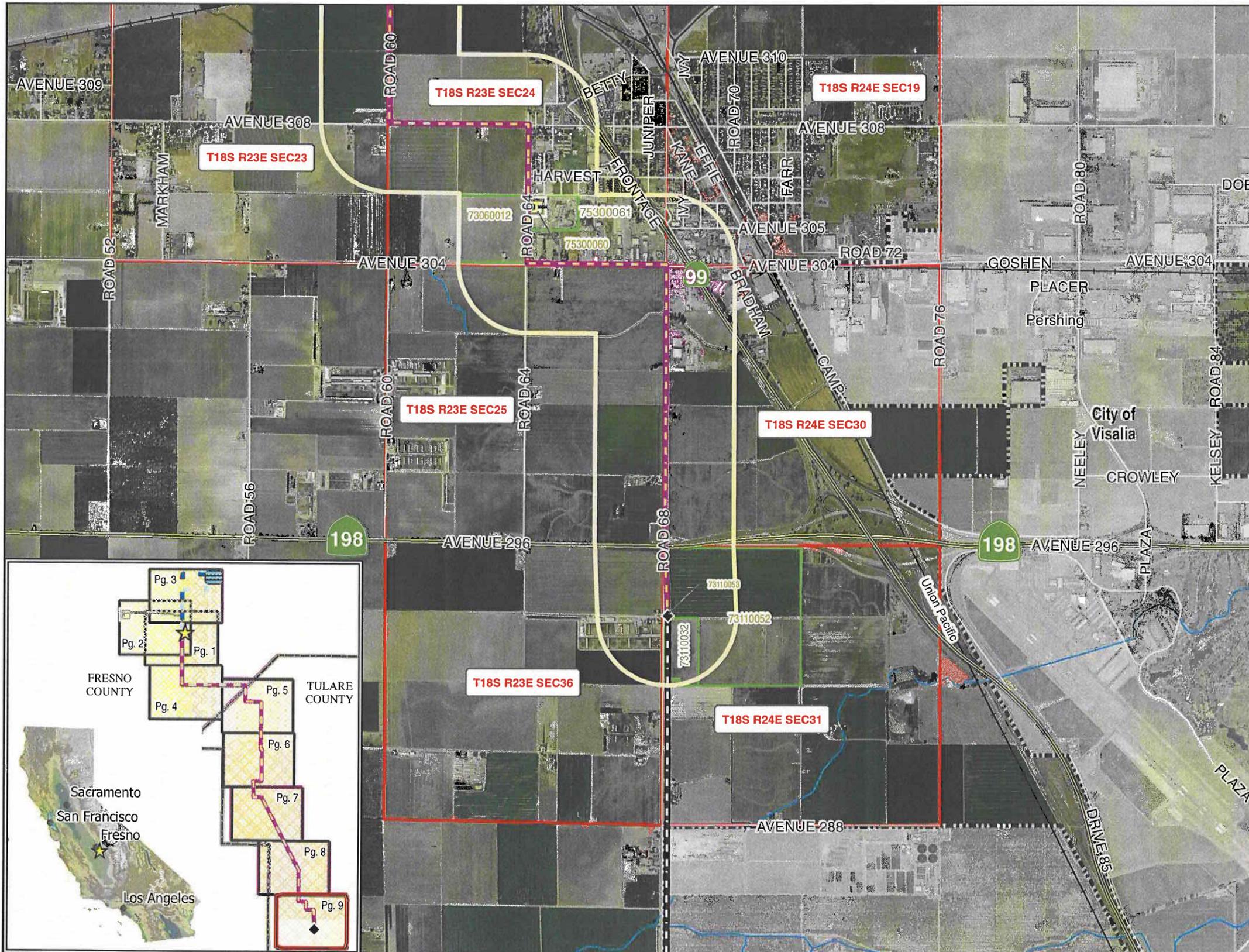
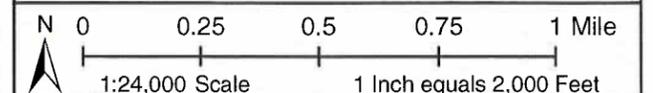
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Project Location Maps

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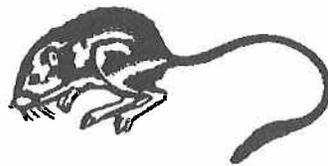
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- Waterway
- County Boundary
- City Boundary

NOTE: Potable Water and Sewer Connections are on the project site.



APPENDIX B

General Habitat Maps



NOTE

Aerial photographs-habitat maps of the power plant site and linear facilities are comprised of a series of fifty-eight 11 by 17 inch color maps at a 1 inch equals 500 feet scale. Examples of such maps are presented in Appendix L. The maps were included in the Biological Assessment report (November 2007) and are incorporated herein in their entirety into this report. The series of 58 maps is available upon request from Halstead & Associates.

APPENDIX C

Photographs of Representative Raptor Nests





Figure 1. Great Horned owl nest at Manning Recharge Basin.



Figure 2. Great Horned owl nest at Manning Recharge Basin.



Figure 3. Example of a hawk nest at Cross Creek area.

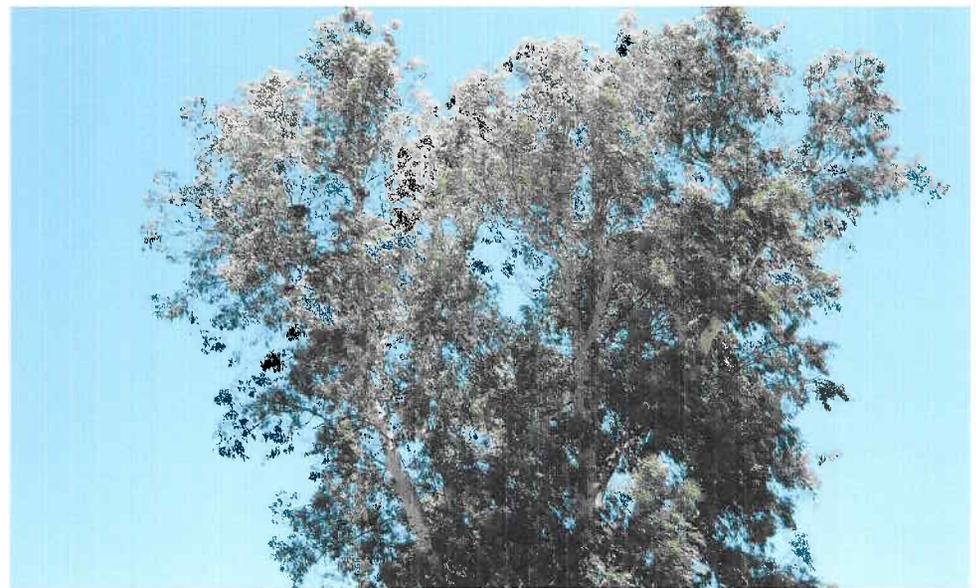


Figure 4. Example of a hawk nest at Cross Creek area.

Examples of raptor nests on the project site . Photos by H&A in March 2008.

APPENDIX D

Life Information on the Burrowing Owl

(CDFG 2008)



CALIFORNIA WILDLIFE HABITAT RELATIONSHIPS SYSTEM
maintained by the
CALIFORNIA DEPARTMENT OF FISH AND GAME
and supported by the
CALIFORNIA INTERAGENCY WILDLIFE TASK GROUP
Database Version 8.1 (2005)

B269 Burrowing Owl *Athene cunicularia*
Family: Strigidae Order: Strigiformes Class: Aves

Written by: C. Polite
Reviewed by: L. Kiff
Edited by: L. Kiff
Updated by: CWHR Program Staff, September 1999

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

A yearlong resident of open, dry grassland and desert habitats, and in grass, forb and open shrub stages of pinyon-juniper and ponderosa pine habitats. Formerly common in appropriate habitats throughout the state, excluding the humid northwest coastal forests and high mountains. Numbers markedly reduced in recent decades. Present on the larger offshore islands. Found as high as 1600 m (5300 ft) in Lassen Co.

SPECIFIC HABITAT REQUIREMENTS

Feeding: Eats mostly insects; also small mammals, reptiles, birds, and carrion. Hunts from a perch, hovers, hawks, dives, and hops after prey on ground.

Cover: Uses rodent or other burrow for roosting and nesting cover. Moves perch to thermoregulate; perches in open sunlight in early morning, and moves to shade, or to burrow, when hot (Coulombe 1971).

Reproduction: Usually nests in old burrow of ground squirrel, or other small mammal. May dig own burrow in soft soil. Nest chamber lined with excrement, pellets, debris, grass, feathers; sometimes unlined. Pipes, culverts, and nest boxes used where burrows scarce (Robertson 1929). Burrowing owl nests have also been observed in buildings (Zambrano 1998).

Water: Water requirements not well known; observed to drink in the wild (Coulombe 1971).

Pattern: Frequents open grasslands and shrublands with perches and burrows.

SPECIES LIFE HISTORY

Activity Patterns: Yearlong, circadian activity. Hunts day or night; frequently perches or stands at burrow entrance in daytime.

Seasonal Movements/Migration: Individuals in northern parts of the range may winter to the south, as far as Central America (Call 1978), but mostly resident in California. May be some movement downslope in winter, or wandering. Strong site fidelity is suggested (Schultz 1993).

Home Range: Home range at the Oakland Airport varied from 0.04 to 1.6 ha (0.1 to 4 ac), with a mean of 0.8 ha (2 ac) (Thomsen 1971).

Territory: Martin (1973) reported average distance between burrows of 166 m (436 ft), but that burrow not defended until another burrowing owl came within 10 m (33 ft).

Reproduction: Male gives courtship display and notes in front of burrow. Breeding occurs from March through August, with peak in April and May. Clutch size 2-10, average 5-6 eggs; may increase to the north (Bent 1938). Young emerge from burrow at about 2 wk, and fly by about 4 wk (Zarn 1974a). Martin (1973) reported 95% of the young fledged, and a mean reproductive success of 4.9 young per pair. Semicolonial; probably the most gregarious owl in North America.

Niche: Conversion of grassland to agriculture, other habitat destruction, and poisoning of ground squirrels have contributed to the reduction in numbers in recent decades, which was noted in the 1940s, and earlier (Grinnell and Miller 1944, Zarn 1974a, Remsen 1978). Predators include prairie falcons, red-tailed hawks, Swainson's hawks, ferruginous hawks, northern harriers, golden eagles, foxes, coyotes, and domestic dogs and cats (Martin 1973). Fleas, lice, and feather mites are common ectoparasites. Collisions with autos may be a significant cause of mortality.

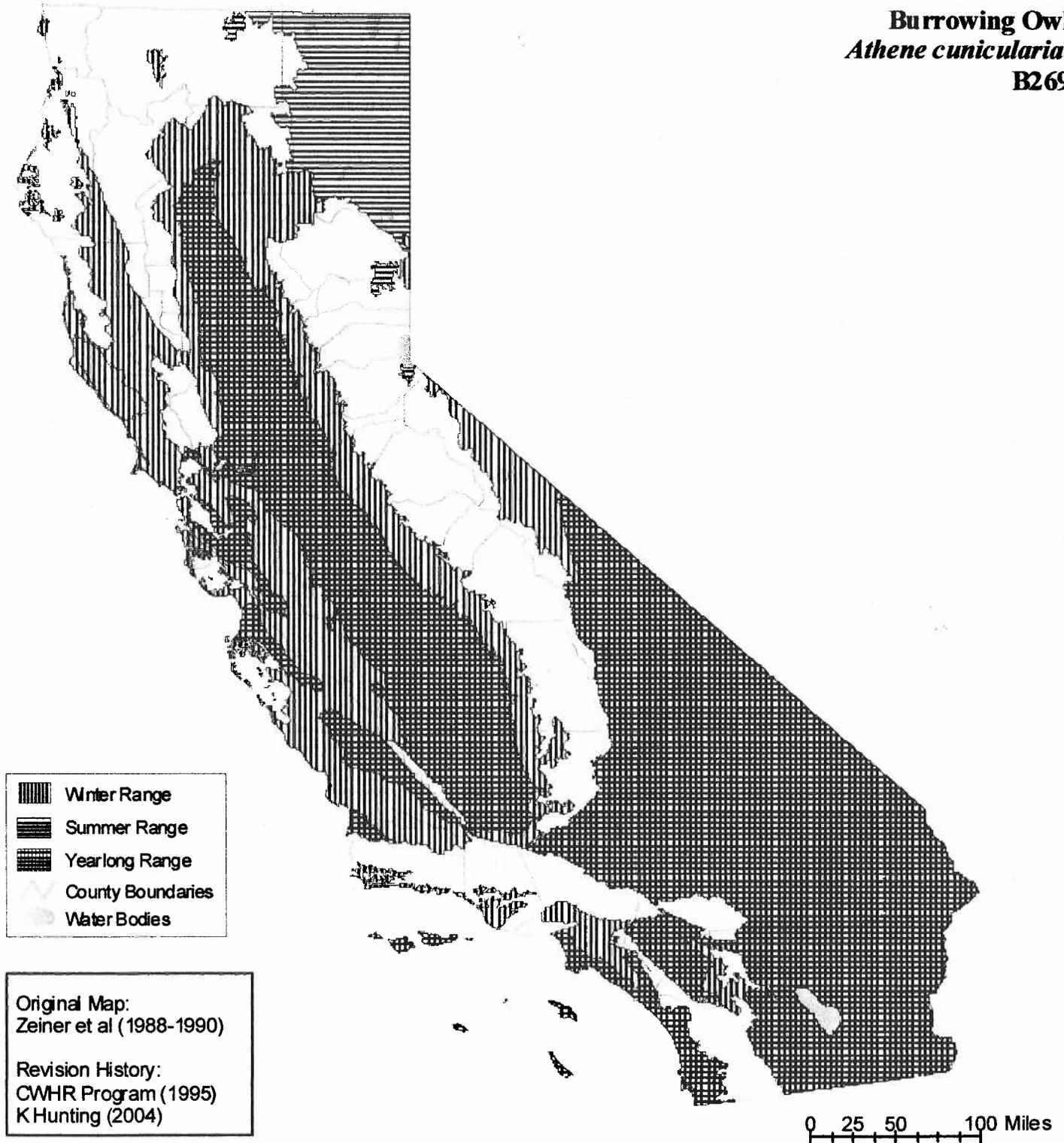
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California Wildlife Habitat Relationships System

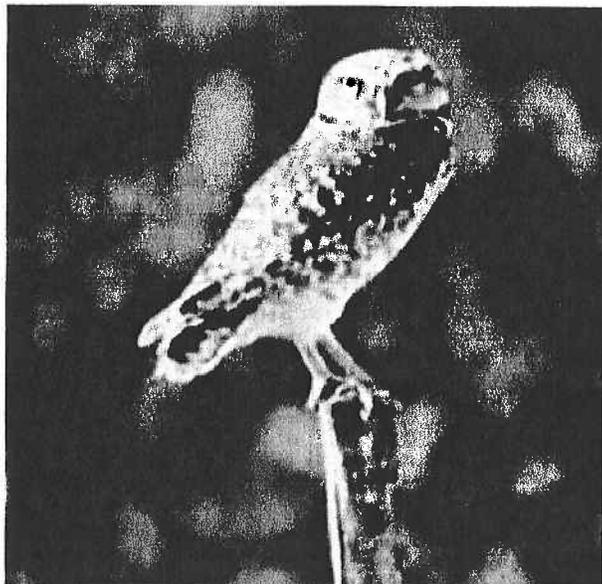
California Department of Fish and Game
California Interagency Wildlife Task Group

Burrowing Owl *Athene cunicularia* B269



Maps are based on available occurrence data and professional knowledge. They represent current, but not historic or potential, range. Unless otherwise noted above, maps were originally published in Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White, eds. 1988-1990. California's Wildlife. Vol. I-III. California Dept. of Fish and Game, Sacramento, California. For more information on mapping methods, visit http://www.dfg.ca.gov/whdab/html/cwhr_metadata.html.

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Burrowing Owl
Athene cunicularia hypugea (= *Athene cunicularia*)

State Status: Species of Special Concern
Federal Status: None

Bird Species of Special Concern in California, Burrowing Owl. California Department of Fish and Game, 1978. Author: J.V. Remsen, Jr.

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Central Valley Bay-Delta Branch, Wildlife Gallery, Burrowing Owl. 1995.

<http://www.delta.dfg.ca.gov/gallery/burowl.asp>

BURROWING OWL

Status and range: This species was formerly a common, even locally abundant, permanent resident throughout much of California, but a decline noticeable by the 1940's (Grinnell and Miller 1944) has continued through to the present time. The decline has been almost universal throughout California. Virtually every observer has expressed concern for the future of this species in his area. There have been no records in northern Napa Co. for 15 years (E. W. Tillay, pers. comm.). There has been a steady decline in numbers reported in Sonoma Co. in recent decades (B. D. Parmeter, pers. comm.). They continue to decline in eastern Alameda Co. and are decreasing in Palo Alto (Stallcup and Greenberg 1974a, 1974b). In the Stockton area, known populations consisting of at least 17 pairs have dwindled to no more than three pairs in the last ten years (D. M. Shanks, pers. comm.). Numbers are decreasing in the Fresno area (R. Hansen, pers. comm.). In Tulare Co., it is estimated that there has been a 70% reduction in suitable habitat in just the last ten years (R. A. Barnes, pers. comm.). It is nearly extinct in San Mateo Co. (ABF), and has greatly declined in Santa Cruz Co. where it was a common bird in the early part of this century (R. Morgan, pers. comm.). Numbers have gone way down in the Santa Barbara region (P. Lehman, pers. comm.), and in the Los Angeles region (A. Small, pers. comm.) where once a common resident (Willetts 1912). Its numbers have also declined in San Diego Co. (A. Fries, J. Dunn, pers. comm.) It was described as "common everywhere" in the Escondido area in the early part of this century (Sharp 1907).

As with the Marsh Hawk, the stronghold of this species may be the state and federal wildlife refuges. The population at San Luis National Wildlife Refuge is estimated to be 25 pairs (L. Littlefield, pers. comm.) and at Mendota Wildlife Area, 30 pairs (R. B. Reno, pers. comm.).

Reasons for the decline: Conversion of grasslands and pasturelands to agriculture and destruction of ground squirrel colonies have been the main factors causing the decline of the Burrowing Owl population (Zarn 1974b). Assimilation of poisons applied to ground squirrel colonies has probably also taken a toll. Their propensity for nesting in roadside banks also makes them particularly vulnerable to roadside shooting, being hit by cars, road maintenance operations, and general harassment. Vicenty (1974) reported three nests destroyed by road construction and one burrow deliberately destroyed by motorcyclists.

Recommendations: (1) Encourage farmers to protect this rodent-eating owl and to avoid disturbing nesting burrows and areas around nest sites. If farmers were made aware of the feeding habits of this bird, they might be more inclined to spare its nest sites from the plough. (2) Protect ground squirrel colonies supporting Burrowing Owls. (3) Manage upland areas in state and federal wildlife refuges to benefit this species.

The Institute for Bird Populations, Burrowing Owl Program

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APPENDIX E

Life Information on the Burrowing Owl

(ESRP 2006)





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Western burrowing owl *Athene cunicularia hypugaea*

STATUS

Federal and California Species of Concern

LIFE HISTORY

The western burrowing owl is a small ground-dwelling owl with a round head that lacks the tufts of feathers which are often referred to as ear tufts. It has white eyebrows, yellow eyes, and long stilt-like legs. The owl is sandy colored on the head, back, and upperparts of the wings and white-to-cream with barring on the breast and belly. Unlike most owls the male is slightly larger than the female and the females are usually darker than the males.

Burrowing owls are found in open, dry grasslands, agricultural and range lands, and desert habitats often associated with burrowing animals. They can also inhabit grass, forb, and shrub stages of pinyon and ponderosa pine habitats. They can be found at elevations ranging from 200 feet below sea level to 9,000 feet. In California, the highest elevation where this species is found is 5,300 feet in Lassen County. The owl commonly perches on fence posts or on top of mounds outside its burrow. These owls can be found at the margins of airports and golf courses and in vacant urban lots. They are active day and night, but are usually less active in the peak of the day.

Burrowing owls tend to be opportunistic feeders. Large arthropods, mainly beetles and grasshoppers, comprise a large portion of their diet. Small mammals, especially mice, rats, gophers, and ground squirrels, are also important food items. Other prey animals include: reptiles and amphibians, scorpions, young cottontail rabbits, bats, and birds, such as sparrows and horned larks. Consumption of insects increases during the breeding season. The burrowing owl hovers while hunting, similar to an American kestrel (*Falco sparverius*), and after catching its prey it returns to a perch on a fence post or the ground. Burrowing owls are primarily crepuscular (active at dusk and dawn), but will hunt throughout a 24-hour period.

As their name suggests, burrowing owls nest in burrows in the ground, often in old ground squirrel burrows or badger dens. They can dig their own burrows, but prefer deserted excavations of other animals. They are

also known to use artificial burrows.

Their nesting season begins in late March or April. The owls often line their nest with an assortment of dry materials. Six to 11 eggs are laid; the average number of eggs is 7-9. Incubation lasts 28-30 days and is performed by only the female. The care of the young while still in the nest is performed by the male. At 14 days of age, the young may be seen roosting at the entrance to the burrow, waiting for the adults to return with food. The young leave the nest at about 44 days and begin chasing living insects when 49-56 days old.

Distribution

The western burrowing owl is found in western North America from Canada to Mexico, and east to Texas, Louisiana. In certain areas of its range, it is migratory; this includes the northern areas of the Great Plains and Great Basin. Although the burrowing owls in northern California are thought to migrate, owls within central and southern California are predominantly nonmigratory.

CLASSIFICATION

Order STRIGIFORMES, Family STRIGIDAE, Genus *Athene*, Species *cunicularia*, Subspecies *hypugaea*

SUBSPECIES

As of 1993, there were up to 18 recognized subspecies of *Athene cunicularia*; 2 in North America: *A. c. hypugaea* inhabits North and Central America west of the eastern edge of the Great Plains south to Panama; and *A. c. floridana* is found in Florida and on the Bahama Islands.

RECENT SYNONYMS

Speotyto cunicularia

OTHER COMMON NAMES

North American burrowing owl

REFERENCES

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SIZE

Length:

21.6-27.9 cm (8.5-11 inches)

Wingspan:

50.8-61.0 cm (20-24 inches)

Weight:

170.1 g (6.0 ounces)

IDENTIFICATION

Burrowing owls lack "ear tufts" and are smaller in size than short-eared owls (*Asio flammeus*). While in flight, they may be confused with other ground-roosting species, such as doves.

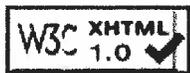
AUTHOR OF PROFILE

N. L. Brown

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Information Contact

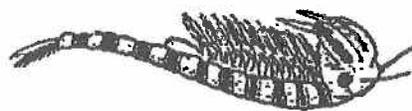
 Printable view



APPENDIX F

Life Information on the Swainson's Hawk

(CDFG 2008)



CALIFORNIA WILDLIFE HABITAT RELATIONSHIPS SYSTEM
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Database Version 8.1 (2005)

B121 Swainson's Hawk *Buteo swainsoni*
Family: Accipitridae Order: Falconiformes Class: Aves

Written by: C. Polite
Reviewed by: L. Kiff
Edited by: L. Kiff

DISTRIBUTION, ABUNDANCE, AND SEASONALITY

Uncommon breeding resident and migrant in the Central Valley, Klamath Basin, Northeastern Plateau, Lassen Co., and Mojave Desert. Very limited breeding reported from Lanfair Valley, Owens Valley, Fish Lake Valley, Antelope Valley, and in eastern San Luis Obispo Co. (Bloom 1980, Garrett and Dunn 1981). Breeds in stands with few trees in juniper-sage flats, riparian areas, and in oak savannah in the Central Valley. Forages in adjacent grasslands or suitable grain or alfalfa fields, or livestock pastures. Bloom (1980) estimated 110 nesting pairs, and a total population of 375 pairs, in California. In southern California, now mostly limited to spring and fall transient. Formerly abundant in California with wider breeding range (Grinnell and Miller 1944, Bloom 1980, Garrett and Dunn 1981). Decline resulted in part from loss of nesting habitat.

SPECIFIC HABITAT REQUIREMENTS

Feeding: Eats mice, gophers, ground squirrels, rabbits, large arthropods, amphibians, reptiles, birds, and, rarely, fish (Brown and Amadon 1968, Dunkle 1977). Soars at low and high levels in search of prey. Also may walk on ground to catch invertebrates and other prey. Catches insects and bats in flight.

Cover: Roosts in large trees, but will roost on ground if none available.

Reproduction: Nests on a platform of sticks, bark, and fresh leaves in a tree, bush, or utility pole from 1.3 to 30 m (4-100 ft) above ground. Nests in open riparian habitat, in scattered trees or small groves in sparsely vegetated flatlands (Bloom 1980).

Water: Usually found near water in the Central Valley, but also nests in arid regions. Water needs probably met from prey.

Pattern: Typical habitat is open desert, grassland, or cropland containing scattered, large trees or small groves.

SPECIES LIFE HISTORY

Activity Patterns: Yearlong, diurnal activity.

Seasonal Movements/Migration: Migrating individuals move south through the southern and central interior of California in September and October, and north March through May (Grinnell and Miller 1944). Some individuals migrate as far as South America, passing in large flocks over Central America (Brown and Amadon 1968).

Home Range: In Utah, breeding home ranges of 3 pairs averaged 4.2 km² (1.6 mi²), and

varied from 3.1 to 5.4 km² (1.2 to 2.1 mi²) (Smith and Murphy 1973). In Wyoming, the distance separating 17 active nests averaged 1.8 km (1.1 mi), and varied from 0.6 to 2.9 km (0.4 to 1.8 mi) (Dunkle 1977). Home ranges of 5 pairs averaged 2.5 km² (1 mi²), and varied from 0.7 to 4.3 km² (0.3 to 1.6 mi²) (Craighead and Craighead 1956).

Territory: Bloom (1980) reported 3 territories within a 1.1 km (0.7 mi) length of riparian habitat in the Central Valley.

Reproduction: Breeding occurs late March to late August, with peak activity late May through July. Clutch size 2-4, usually 2 or 3 eggs. Incubates 25-28 days (Beebe 1974). Craighead and Craighead (1956) reported fledging success of 0.6 young per pair.

Niche: May be preyed upon by golden eagles. Competitors for food include northern harriers, red-tailed hawks, black-shouldered kites, burrowing owls, and golden eagles (Craighead and Craighead 1956).

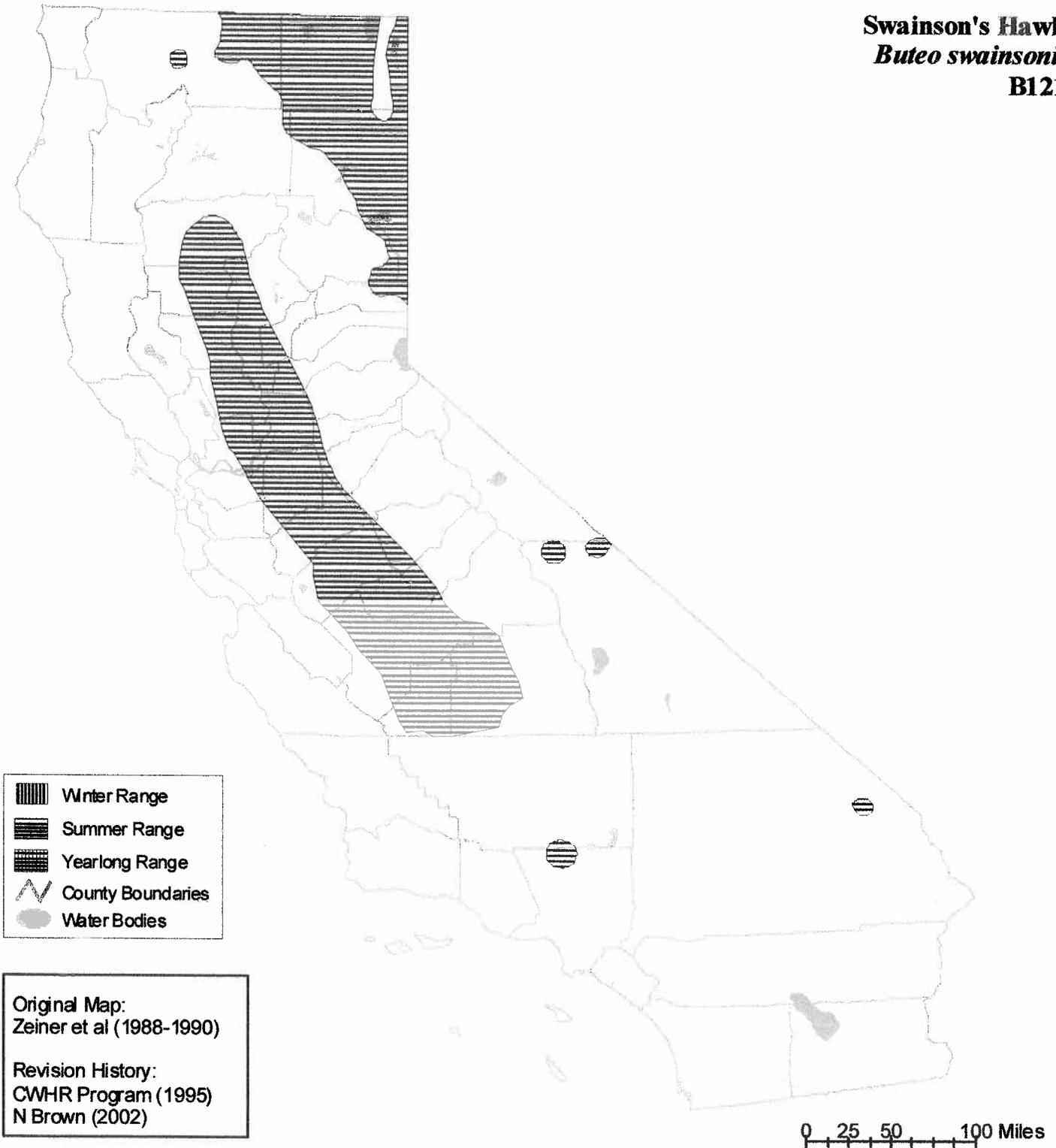
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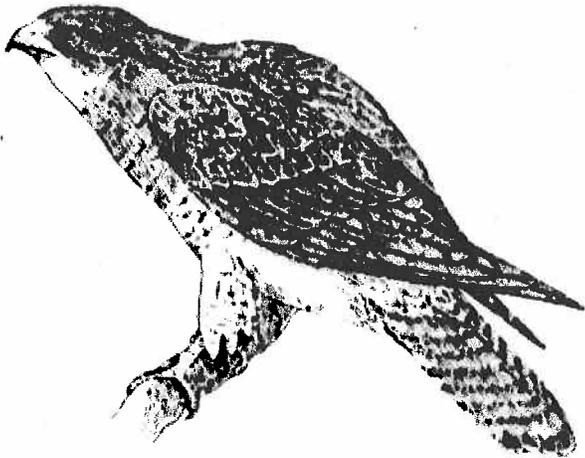
California Department of Fish and Game
California Interagency Wildlife Task Group

Swainson's Hawk *Buteo swainsoni* B121



Maps are based on available occurrence data and professional knowledge. They represent current, but not historic or potential, range. Unless otherwise noted above, maps were originally published in Zeiner, D.C., W.F. Laudenslayer, Jr., K.E. Mayer, and M. White, eds. 1988-1990. California's Wildlife. Vol. I-III. California Dept. of Fish and Game, Sacramento, California. For more information on mapping methods, visit http://www.dfg.ca.gov/whdab/html/cwhr_metadata.html.

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Swainson's Hawk
Buteo swainsoni

State Status: Threatened, 1983
Federal Status: None

The Status of Rare, Threatened, and Endangered Animals and Plants in California, Swainson's Hawk. California Department of Fish and Game, 2000.

<http://www.dfg.ca.gov/biogeodata/cwhr/wpd/birds/B121.pdf>

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Endangered Species Profiles, Swainson's Hawk. San Joaquin Valley Endangered Species Recovery Program, Calif. State Univ., Stanislaus.

<http://arnica.csustan.edu/esrpp/swainson.htm>

Swainson's hawk, Biology. Endangered Species Project, California Department of Pesticides Regulation.

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Central Valley Bay-Delta Branch, Wildlife Gallery, Swainson's Hawk.

<http://www.delta.dfg.ca.gov/gallery/swainson.asp>

SWAINSON'S HAWK

The Swainson's hawk is a medium-sized hawk with relatively long, pointed wings and a long, square tail. Adult females weigh 28 to 34 ounces and males 25 to 31 ounces. Swainson's hawks breeding in California may spend the winter in Mexico and South

America. Central Valley birds appear to winter in Mexico and Columbia and hawks from northeastern California have been satellite-transmitter tracked to Argentina. The diet of the Swainson's hawk is varied with the California vole being the staple in the Central Valley. A variety of bird and insect species are also taken. Over 85 percent of Swainson's hawk territories in the Central Valley are in riparian systems adjacent to suitable foraging habitats. Swainson's hawks often nest peripherally to riparian systems of the valley as well as utilizing lone trees or groves of trees in agricultural fields. Valley oak, Fremont cottonwood, walnut, and large willow with an average height of about 58 feet, and ranging from 41 to 82 feet, are the most commonly used nest trees in the Central Valley. Swainson's hawks require large, open grasslands with abundant prey in association with suitable nest trees. Suitable foraging areas include native grasslands or lightly grazed pastures, alfalfa and other hay crops, and certain grain and row croplands. Unsuitable foraging habitat includes crops such as vineyards, orchards, certain row crops, rice, corn and cotton crops. Suitable nest sites may be found in mature riparian forest, lone trees or groves of oaks, other trees in agricultural fields, and mature roadside trees.

Swainson's hawks were once found throughout lowland California and were absent only from the Sierra Nevada, north Coast Ranges and Klamath Mountains, and portions of the desert regions of the State. Today, Swainson's hawks are restricted to portions of the Central Valley and Great Basin regions where suitable nesting and foraging habitat is still available. Central Valley populations are centered in Sacramento, San Joaquin, and Yolo counties. During historical times (ca. 1900), Swainson's hawks may have maintained a population in excess of 17,000 pairs. Based on a study conducted in 1994, the statewide population is estimated to be approximately 800 pairs. Although more recent surveys have been planned to revise this estimate, there has been inadequate funding available to carry out the research. However, surveys in 1998 and 1999 in the Owens Valley area of the State revealed a larger population (about 20 pairs) than previously documented, centered around alfalfa fields in the area.

The loss of agricultural lands to various residential and commercial developments is a serious threat to Swainson's hawks throughout California. Additional threats are habitat loss due to riverbank protection projects, conversion from agricultural crops that provide abundant foraging opportunities to crops such as vineyards and orchards which provide fewer foraging opportunities, shooting, pesticide poisoning of prey animals and hawks on wintering grounds, competition from other raptors, and human disturbance at nest sites.

An ad-hoc group of researchers called the Swainson's Hawk Technical Advisory Committee (TAC) is currently developing a draft of a recovery plan for the species. The TAC has been active in habitat management planning, symposia sponsorship, and county planning issues within the critical three county range of the species. The TAC is currently active in several telemetry research projects. Despite the lack of a recovery plan, actions that may lead to recovery have been ongoing since the listing in 1983. These include the development of federal HCPs and State 2081 incidental take agreements within the range of the species. Management needs of the Swainson's hawk are fairly well known for the Central Valley breeding population. These include ensuring the availability of suitable nesting and foraging habitat through preservation of riparian systems and groves of and lone mature trees in agricultural fields, and maintenance of compatible (with the Swainson's hawk) agricultural practices in grasslands, pastures and croplands. Compatible agriculture is essential to the maintenance of current Swainson's hawk populations.

Recent die-offs of several thousand Swainson's hawks and other raptors attributed to pesticide use at agricultural fields in Argentina have prompted intense interest and actions on the part of scientists, industry, and governments to alleviate the problem. In partnership with chemical companies and landowners, initial efforts of raptor researchers have resulted in certain chemical compounds known to cause hawk mortality being replaced with what are hoped to be less dangerous substitutes. Monitoring will continue to detect and ensure against further hawk die-offs.

In 1997, six hawks were fitted with satellite transmitters and tracked during their southward migration. The birds were located wintering in a region north of Mexico City, Mexico, and near Bogota, Columbia. No birds from the Central Valley have been tracked further south, although a bird from northern California was tracked to Argentina during the winter of 1996. This study is ongoing and is intended to gather data on migration and wintering habits of the species over the next several years. The significance of the finding that Swainson's hawks winter in Mexico rather than Argentina is that there is little exposure to the kinds of pesticide poisoning suffered by the birds south of the equator. Agricultural operations are different with little or no pesticide application to croplands that the birds frequent in order to find prey. Transmitters were affixed in 1998 and 1999 and results confirm that the Swainson's hawks of the Central Valley migrate to a wintering area (in Mexico) quite different (and perhaps safer) from the majority of the Nation's population of Swainson's hawks.

The DFG is currently developing state-of-the-art GIS products for use in Swainson's hawk recovery planning. Earlier generations of these same GIS tools have been developed at the county level to aid in land use planning tasks and HCP development.

The status in 1999 of Swainson's hawk: Declining.

California's Wildlife, Birds, Swainson's Hawk. California Wildlife Habitat Relationships System, California Department of Fish and Game, 1983.

Quick Search for Species Accounts

You may only search for: Rare, Threatened, or Endangered Species, Fully Protected Species, and Species of Special Concern.

You may search for a species account by choosing an animal type or a plant by clicking on a button below.

Amphibian Bird Fish Invertebrate Mammal Plant Reptile



Then enter all or part of a species' common name or of its scientific name in the box below.

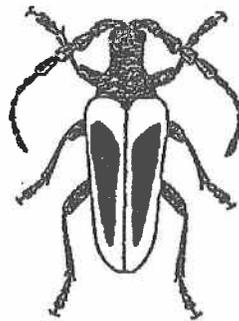
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APPENDIX G

Life Information on the Swainson's Hawk

(ESRP 2006)





Endangered Species Recovery Program

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Swainson's hawk *Buteo swainsoni*

STATUS

California Threatened and Federal Species of Concern

LIFE HISTORY

Swainson's hawk is diurnal and similar in size to the more common red-tailed hawk (*Buteo jamaicensis*). There are two distinct color phases (morphs) of Swainson's hawks--light and dark-- with variations in between. Hawks of the light morph are the easiest to distinguish from other buteos (hawks of the same genus as Swainson's and the red-tailed). They have a whitish forehead and white patch on the throat below the bill. The rest of the head, sides of the throat, patch on its chest (resembling a baby's bib), and all other upper body parts are dark brown. The belly is white, barred with brown. In flight, their wings have dark trailing edges that contrast with the light colored leading edges and the belly.

Individuals of the dark morph are entirely dark brown, except for a patch under the tail. When overhead, the trailing edges of their wings might be slightly lighter in color than the leading edges. Throughout their geographic range, hawks of the dark morph comprise only 1 to 10% of the population; however, within northern California, the dark morph constitutes 35% of the population. There also is a rufous-colored variant of the dark morph that is lighter brown with rusty barring on the underparts.

Swainson's hawks prefer open habitats. These include: mixed and short grass grasslands with scattered trees or shrubs for perching; dry grasslands; irrigated meadows; and edges between two habitat types (ecotones). Within California, Swainson's hawks favor agricultural areas, (particularly alfalfa fields), juniper-sage flats, riparian areas, and oak savannas. Over 95% of the nesting sites for this species are estimated to be on private lands.

In the summer months, Swainson's hawks primarily eat insects, birds, and small mammals, occasionally taking reptiles, amphibians, and other invertebrates. During migration and in the winter, the hawk's diet consists of mainly of insects. The hawks appear to exploit the abundance of prey made available due to the effects of certain farming activities. This is most noticeable during migration when large flocks of Swainson's and other migrating hawks can be seen within fields being plowed. The birds will perch on the ground and wait for the tractor to pass by and then pounce on prey stirred up by the tractor. They will also follow the tractor diving down on the prey that the tractor stirs up.

Within California, Swainson's hawks begin nesting in late March and the young usually leave the nest (fledge) by July. Nests of sticks, bark, and fresh leaves are constructed in trees, shrubs, or on utility poles at heights of 4 to 100 ft. (1.2 to 30.5 m) above the ground. In the Central Valley they nest in riparian areas. This association with riparian habitat is most likely due to the lack of trees in intensively cultivated and industrially-developed areas. Two to four eggs are laid at 2-day intervals and incubation lasts between 25 and 36 days. Incubation is performed primarily by the female; however, the male will cover the eggs when the female leaves the nest to forage. The young will leave the nest between 33 and 37 days after hatching and begin to kill insects and snakes on their own.

The populations of Swainson's hawks have declined by 90% since the 1940's due to the loss of nesting habitat. In the 1980's there was an estimated 375 pairs within California, but not all pairs nested. Although it is not an evident threat within California, pesticides and insecticides are a severe threat to the wintering birds in Argentina, killing over 10,000 birds in 1995 alone.

Distribution

Swainson's hawks breed in local areas in western North America, including east-central Alaska, southwest Canada, eastern Washington and Oregon, and in the Central Valley of California. The majority of the birds migrate south to the La Pampas region in Argentina for the winter months. Many juveniles form pre-migration flocks one or two months prior to migrating; however, there are a few groups of juveniles that do not migrate their first winter. When migrating and during the winter, this species forms large flocks of 20 to 100 birds that roost and forage together.

Migration of Swainson's hawks' south begins in August and lasts through October. In the spring, they begin returning north to California in March. The populations that nest within the Central Valley arrive and depart earlier than those populations in northern California. The intensity of the summer heat in the Valley is thought to be the trigger for these earlier dates.

CLASSIFICATION

Order FALCONIFORMES, Family ACCIPITRIDAE, Genus *Buteo*, Species *swainsoni*

SUBSPECIES

None

RECENT SYNONYMS

None

OTHER COMMON NAMES

grasshopper hawk

REFERENCES

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and mammal Section Report, 52 pp.

SIZE

Length:

48.3-55.9 cm (19-22 inches)

Wingspan:

119.4-144.8 cm (47-57 inches)

Weight (average):

males--0.81 kg (1.81 lb)

females--1.11 kg (2.44 lb)

IDENTIFICATION

Juveniles of the Swainson's hawk resemble those of the red-tailed hawk, however, Swainson's hawks lack the brown belly band characteristic of red-tailed hawks.

The call of the Swainson's hawk also is similar to that of the red-tailed hawk's, but the Swainson's is higher in pitch and weaker.

AUTHOR OF PROFILE

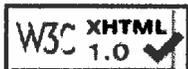
N. L. Brown

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Endangered Species Recovery Program

Information Contact

 Printable view



APPENDIX H

Staff Report on Burrowing Owl Mitigation

(CDFG 1995)



STAFF REPORT ON BURROWING OWL MITIGATION

Introduction

The Legislature and the Fish and Game Commission have developed the policies, standards and regulatory mandates to protect native species of fish and wildlife. In order to determine how the Department of Fish and Game (Department) could judge the adequacy of mitigation measures designed to offset impacts to burrowing owls (*Speotyto cunicularia*; A.O.U. 1991) staff (WMD, ESD, and Regions) has prepared this report. To ensure compliance with legislative and commission policy, mitigation requirements which are consistent with this report should be incorporated into: (1) Department comments to Lead Agencies and project sponsors pursuant to the California Environmental Quality Act (CEQA); and (2) other authorizations the Department gives to project proponents for projects impacting burrowing owls.

This report is designed to provide the Department (including regional offices and divisions), CEQA Lead Agencies and project proponents the context in which the Environmental Services Division (ESD) will review proposed project specific mitigation measures. This report also includes preapproved mitigation measures which have been judged to be consistent with policies, standards and legal mandates of the Legislature, the Fish and Game Commission and the Department's public trust responsibilities. Implementation of mitigation measures consistent with this report are intended to help achieve the conservation of burrowing owls and should compliment multi-species habitat conservation planning efforts currently underway. The *Burrowing Owl Survey Protocol and Mitigation Guidelines* developed by The California Burrowing Owl Consortium (CBOC 1993) were taken into consideration in the preparation of this staff report as were comments from other interested parties.

A range-wide conservation strategy for this species is needed. Any range-wide conservation strategy should establish criteria for avoiding the need to list the species pursuant to either the California or federal Endangered Species Acts through preservation of existing habitat, population expansion into former habitat, recruitment of young into the population, and other specific efforts.

California's burrowing owl population is clearly declining and, if declines continue, the species may qualify for listing. Because of the intense pressure for urban development within suitable burrowing owl nesting and foraging habitat (open, flat and gently rolling grasslands and grass/shrub lands) in California, conflicts between owls and development projects often occur. Owl survival can be adversely affected by disturbance and foraging habitat loss even when impacts to individual birds and nests/burrows are avoided. Adequate information about the presence of owls is often unavailable prior to project approval. Following project approval there is no legal mechanism through which to seek mitigation other than avoidance of occupied burrows or nests. The absence of standardized survey methods often impedes consistent impact assessment.

Burrowing Owl Habitat Description

Burrowing owl habitat can be found in annual and perennial grasslands, deserts, and arid scrublands characterized by low-growing vegetation (Zarn 1974). Suitable owl habitat may also include trees and shrubs if the canopy covers less than 30 percent of the ground surface. Burrows are the essential component of burrowing owl habitat. Both natural and artificial burrows provide protection, shelter, and nests for burrowing owls (Henny and Blus 1981). Burrowing owls typically use burrows made by fossorial mammals, such as ground squirrels or badgers, but also may use man-made structures such as cement culverts; cement, asphalt, or wood debris piles; or openings beneath cement or asphalt pavement.

Occupied Burrowing Owl Habitat

Burrowing owls may use a site for breeding, wintering, foraging, and/or migration stopovers. Occupancy of suitable burrowing owl habitat can be verified at a site by detecting a burrowing owl, its molted feathers, cast pellets, prey remains, eggshell fragments, or excrement at or near a burrow entrance. Burrowing owls exhibit high site fidelity, reusing burrows year after year (Rich 1984, Feeney 1992). A site should be assumed occupied if at least one burrowing owl has been observed occupying a burrow there within the last three years (Rich 1984).

CEQA Project Review

The measures included in this report are intended to provide a decision-making process that should be implemented whenever there is potential for an action or project to adversely affect burrowing owls. For projects subject to the California Environmental Quality Act (CEQA), the process begins by conducting surveys to determine if burrowing owls are foraging or nesting on or adjacent to the project site. If surveys confirm that the site is occupied habitat, mitigation measures to minimize impacts to burrowing owls, their burrows and foraging habitat should be incorporated into the CEQA document as enforceable conditions. The measures in this document are intended to conserve the species by protecting and maintaining viable populations of the species throughout their range in California. This may often result in protecting and managing habitat for the species at sites away from rapidly urbanizing/developing areas. Projects and situations vary and mitigation measures should be adapted to fit specific circumstances.

Projects not subject to CEQA review may have to be handled separately since the legal authority the Department has with respect to burrowing owls in this type of situation is often limited. The burrowing owl is protected from "take" (Section 3503.5 of the Fish and Game Code) but unoccupied habitat is likely to be lost for activities not subject to CEQA.

Legal Status

The burrowing owl is a migratory species protected by international treaty under the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703-711). The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in 50 C.F.R. Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 C.F.R. 21). Sections 3505, 3503.5, and 3800 of the California Department of Fish and Game Code prohibit the take, possession, or destruction of birds, their nests or eggs. To avoid violation of the take provisions of these laws generally requires that project-related disturbance at active nesting territories be reduced or eliminated during the nesting cycle (February 1 to August 31). Disturbance that causes nest abandonment and/or loss of reproductive effort (e.g., killing or abandonment of eggs or young) may be considered "take" and is potentially punishable by fines and/or imprisonment.

The burrowing owl is a Species of Special Concern to California because of declines of suitable habitat and both localized and statewide population declines. Guidelines for the Implementation of the California Environmental Quality Act (CEQA) provide that a species be considered as endangered or "rare" regardless of appearance on a formal list for the purposes of the CEQA (Guidelines, Section 15380, subsections b and d). The CEQA requires a mandatory findings of significance if impacts to threatened or endangered species are likely to occur (Sections 21001 (c), 2103; Guidelines 15380, 15064, 15065). To be legally adequate, mitigation measures must be capable of "avoiding the impact altogether by not taking a certain action or parts of an action"; "minimizing impacts by limiting the degree or magnitude of the action and its implementation"; "rectifying the impact by repairing, rehabilitating or restoring the impacted environment"; "or reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action" (Guidelines, Section 15370). Avoidance or mitigation to reduce impacts to less than significant levels must be included in a project or the CEQA lead agency must make and justify findings of overriding considerations.

Impact Assessment

Habitat Assessment

The project site and a 150 meter (approximately 500 ft.) buffer (where possible and appropriate based on habitat) should be surveyed to assess the presence of burrowing owls and their habitat (Thomsen 1971, Martin 1973). If occupied habitat is detected on or adjacent to the site, measures to avoid, minimize, or mitigate the project's impacts to the species should be incorporated into the project, including burrow preconstruction surveys to ensure avoidance of direct take. It is also recommended that preconstruction surveys be conducted if the species was not detected but is likely to occur on the project site.

Burrowing Owl and Burrow Surveys

Burrowing owl and burrow surveys should be conducted during both the wintering and nesting seasons, unless the species is detected on the first survey. If possible, the winter survey should be conducted between December 1 and January 31 (when wintering owls are most likely to be present) and the nesting season survey should be conducted between April 15 and July 15 (the peak of the breeding season). Surveys conducted from two hours before sunset to one hour after, or from one hour before to two hours after sunrise, are also preferable.

Surveys should be conducted by walking suitable habitat on the entire project site and (where possible) in areas within 150 meters (approx. 500 ft.) of the project impact zone. The 150-meter buffer zone is surveyed to identify burrows and owls outside of the project area which may be impacted by factors -such as noise and vibration (heavy equipment, etc.) during project construction. Pedestrian survey transects should be spaced to allow 100 percent visual coverage of the ground surface. The distance between transect center lines should be no more than 30 meters (approx. 100 ft.) and should be reduced to account for differences in terrain, vegetation density, and ground surface visibility. To effectively survey large projects (100 acres or larger), two or more surveyors should be used to walk adjacent transects. To avoid impacts to owls from surveyors, owls and/or occupied burrows should be avoided by a minimum of 50 meters (approx. 160 ft.) wherever practical. Disturbance to occupied burrows should be avoided during all seasons.

Definition of Impacts

The following should be considered impacts to the species:

- Disturbance within 50 meters (approx. 160 ft.) Which may result in harassment of owls at occupied burrows;
- Destruction of natural and artificial burrows (culverts, concrete slabs and debris piles that provide shelter to burrowing owls); and
- Destruction and/or degradation of foraging habitat adjacent (within 100 m) of an occupied burrow(s).

Written Report

A report for the project should be prepared for the Department and copies should be submitted to the Regional contact and to the Wildlife Management Division Bird and Mammal Conservation Program. The report should include the following information:

- Date and time of visit(s) including name of the qualified biologist conducting surveys, weather and visibility conditions, and survey methodology;
- Description of the site including location, size, topography, vegetation communities, and animals observed during visit(s);
- Assessment of habitat suitability for burrowing owls;
- Map and photographs of the site;
- Results of transect surveys including a map showing the location of all burrow(s) (natural or artificial) and owl(s), including the numbers at each burrow if present and tracks, feathers, pellets, or other items (prey remains, animal scat);
- Behavior of owls during the surveys;
- Summary of both winter and nesting season surveys including any productivity information and a map showing territorial boundaries and home ranges; and
- Any historical information (Natural Diversity Database, Department regional files? Breeding Bird Survey data, American Birds records, Audubon Society, local bird club, other biologists, etc.) regarding the presence of burrowing owls on the site.

Mitigation

The objective of these measures is to avoid and minimize impacts to burrowing owls at a project site and preserve habitat that will support viable owls populations. If burrowing owls are detected using the project area, mitigation measures to minimize and offset the potential impacts should be included as enforceable measures during the CEQA process.

Mitigation actions should be carried out from September 1 to January 31 which is prior to the nesting season (Thomsen 1971, Zam 1974). Since the timing of nesting activity may vary with latitude and climatic conditions, this time frame should be adjusted accordingly. Preconstruction surveys of suitable habitat at the project site(s) and buffer zone(s) should be conducted within the 30 days prior to construction to ensure no additional, burrowing owls have established territories since the initial surveys. If ground disturbing activities are delayed or suspended for more than 30 days after the preconstruction survey, the site should be resurveyed.

Although the mitigation measures may be included as enforceable project conditions in the CEQA process, it may also be desirable to formalize them in a Memorandum of Understanding (MOU) between the Department and the project sponsor. An MOU is needed when lands (fee title or conservation easement) are being transferred to the Department.

Specific Mitigation Measures

1. Occupied burrows should not be disturbed during the nesting season (February 1 through August 31) unless a qualified biologist approved by the Department verifies through non-invasive methods that either: (1) the birds have not begun egg-laying and incubation; or (2) that juveniles from the occupied burrows are foraging independently and are capable of independent survival.
2. To offset the loss of foraging and burrow habitat on the project site, a minimum of 6.5 acres of foraging habitat (calculated on a 100 m {approx. 300 ft.} foraging radius around the burrow) per pair or unpaired resident bird, should be acquired and permanently protected. The protected lands should be adjacent to occupied burrowing owl habitat and at a location acceptable to the Department. *Protection of additional habitat acreage per pair or unpaired resident bird may be applicable in some instances.* The CBOC has also developed mitigation guidelines (CBOC 1993) that can be incorporated by CEQA lead agencies and which are consistent with this staff report.
3. When destruction of occupied burrows is unavoidable, existing unsuitable burrows should be enhanced (enlarged or cleared of debris) or new burrows created (by installing artificial burrows) at a ratio of 2:1 on the protected lands site. One example of an artificial burrow design is provided in Attachment A.
4. If owls must be moved away from the disturbance area, passive relocation techniques (as described below) should be used rather than trapping. At least one or more weeks will be necessary to accomplish this and allow the owls to acclimate to alternate burrows.
5. The project sponsor should provide funding for long-term management and monitoring of the protected lands. The monitoring plan should include success criteria, remedial measures, and an annual report to the Department.

Impact Avoidance

If avoidance is the preferred method of dealing with potential project impacts, then no disturbance should occur within 50 meters (approx. 160 ft.) of occupied burrows during the nonbreeding season of September 1 through January 31 or within 75 meters (approx. 250 ft.) during the breeding season of February 1 through August 31. Avoidance also requires that a minimum of 6.5 acres of foraging habitat be *permanently* preserved contiguous with occupied burrow sites for each pair of breeding burrowing owls (with or without dependent young) or single unpaired resident bird. The configuration of the protected habitat should be approved by the Department.

Passive Relocation - With One-Way Doors

Owls should be excluded from burrows in the immediate impact zone and within a 50 meter (approx. 160 ft.) buffer zone by installing one-way doors in burrow entrances. One-way doors (e.g., modified dryer vents) should be left in place 48 hours to insure owls have left the burrow before excavation. Two natural or artificial burrows should be provided for each burrow in the project area that will be rendered biologically unsuitable. The project area should be *monitored daily for one week* to confirm owl use of burrows before excavating burrows in the immediate impact zone. Whenever possible, burrows should be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe should be inserted into the tunnels during excavation to maintain an escape route for any animals inside the burrow.

Passive Relocation - Without One-Way Doors

Two natural or artificial burrows should be provided for each burrow in the project area that will be rendered biologically unsuitable. The project area should be *monitored daily until the owls have relocated to the new burrows*. The formerly occupied burrows may then be excavated. Whenever possible, burrows should be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe should be inserted into burrows during excavation to maintain an escape route for any animals inside the burrow.

Projects Not Subject to CEQA

The Department is often contacted regarding the presence of burrowing owls on construction sites, parking lots and other areas for which there is no CEQA action or for which the CEQA process has been completed. In these situations, the Department should seek to reach agreement with the project sponsor to implement the specific mitigation measures described above. If they are unwilling to do so, passive relocation without the aid of one-way doors is their only option based upon Fish and Game Code 3503.5.

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Reproductive Success of Burrowing Owls Using Artificial Nest Burrows in Southeastern Idaho

by Bruce Olenick

Artificial nest burrows were implanted in southeastern Idaho for burrowing owls in the spring of 1986. These artificial burrows consisted of a 12" x 12" x 8" wood nesting chamber with removable top and a 6 foot corrugated and perforated plastic drainage pipe 6 inches in diameter (Fig. 1). Earlier investigators claimed that artificial burrows must provide a natural dirt floor to allow burrowing owls to modify the nesting tunnel and chamber. Contrary to this, the artificial burrow introduced here does not allow owls to modify the entrance or tunnel. The inability to change the physical dimensions of the burrow tunnel does not seem to reflect the owls' breeding success or deter them from using this burrow design.

In 1936, 22 artificial burrows were inhabited. Thirteen nesting attempts yielded an average clutch size of 8.3 eggs per breeding pair. Eight nests successfully hatched at least 1 nestling. In these nests, 67 of 75 eggs hatched (59.3%) and an estimated 61 nestlings (91.0%) fledged. An analysis of the egg laying and incubation periods showed that incubation commenced well after egg lay-

ing began. Average clutch size at the start of incubation was 5.6 eggs. Most eggs tended to hatch synchronously in all successful nests.

Although the initial cost of constructing this burrow design may be slightly higher than a burrow consisting entirely of wood, the plastic pipe burrow offers the following advantages: (1) it lasts several field seasons without rotting or collapsing; (2) it may prevent or retard predation; (3) construction time is min-

imal; (4) it is easy to transport, especially over long distances; and (5) the flexible tunnel simplifies installation. The use of this artificial nest burrow design was highly successful and may prove to be a great resource technique for future management of this species.

For additional information on constructing this artificial nest burrow, contact Bruce Olenick, Department of Biology, Idaho State University, Pocatello, ID 83209.

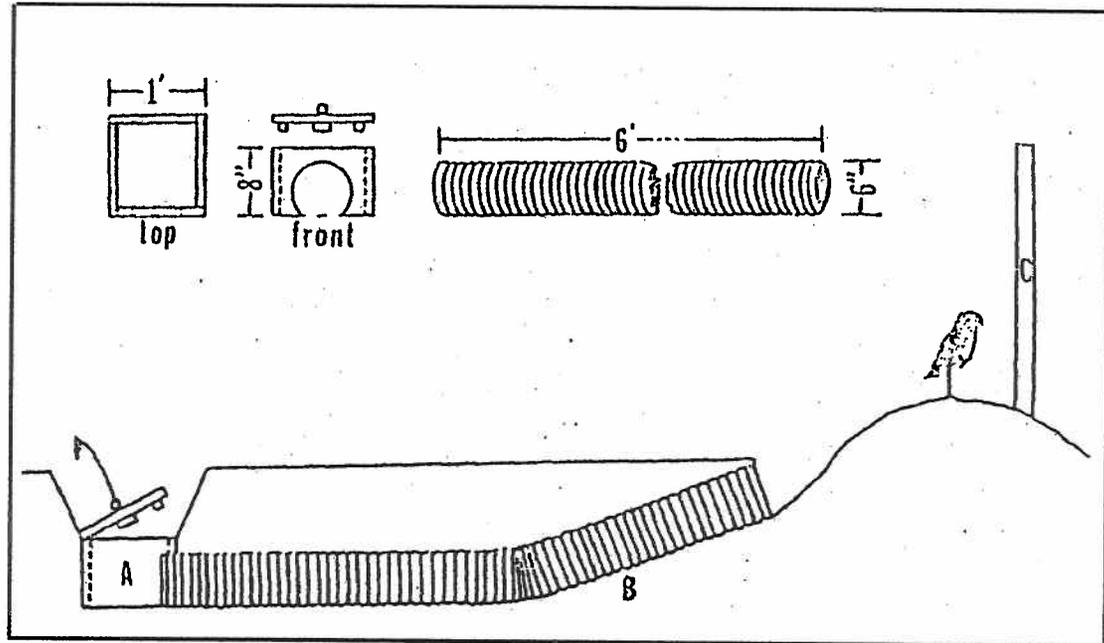


fig. 1 Artificial nest burrow design for burrowing owls. Entire unit (including nest chamber) is buried 12" - 18" below ground for maintaining thermal stability of the nest chamber. A = nest chamber, B = plastic pipe. C = perch.

Memorandum

: "Div. Chiefs - IFD, BDD, NED, & WMD
Reg. Mgrs. - Regions 1, 2, 3, 4, & 5

Date : October 17, 1995

From : Department of Fish and Game

Subject :
Staff Report on Burrowing Owl Mitigation

I am hereby transmitting the Staff Report on Burrowing Owl Mitigation for your use in reviewing projects (California Environmental Quality Act [CEQA] and others) which may affect burrowing owl habitat. The Staff Report has been developed during the last several months by the Environmental Services Division (ESD) in cooperation with the Wildlife Management Division (WMD) and regions 1, 2, and 4. It has been sent out for public review and redrafted as appropriate.

Either the mitigation measures in the staff report may be used or project specific measures may be developed. Alternative project specific measures proposed by the Department divisions/regions or by project sponsors will also be considered. However, such mitigation measures must be submitted to ESD for review. The review process will focus on the consistency of the proposed measure with Department, Fish and Game Commission, and legislative policy and with laws regarding raptor species. ESD will coordinate project specific mitigation measure review with WMD.

If you have any questions regarding the report, please contact Mr. Ron Rempel, Supervising Biologist, Environmental Services Division, telephone (916) 654-9980.

COPY Original signed by
C.F. Raysbrook

C. F. Raysbrook
Interim Director

Attachment

cc: Mr. Ron Rempel
Department of Fish and Game
Sacramento

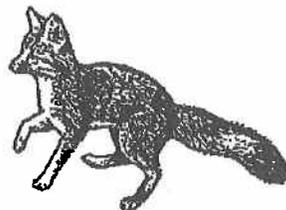
APPENDIX I

Burrowing Owl Survey Protocol

and

Mitigation Guidelines

(Burrowing Owl Consortium 1993)



**BURROWING OWL SURVEY PROTOCOL
AND MITIGATION GUIDELINES**

Prepared by:

The California Burrowing Owl Consortium

April 1993

INTRODUCTION

The California Burrowing Owl Consortium developed the following Survey Protocol and Mitigation Guidelines to meet the need for uniform standards when surveying burrowing owl (*Speotyto cunicularia*) populations and evaluating impacts from development projects. The California Burrowing Owl Consortium is a group of biologists in the San Francisco Bay area who are interested in burrowing owl conservation. The following survey protocol and mitigation guidelines were prepared by the Consortium's Mitigation Committee. These procedures offer a decision-making process aimed at preserving burrowing owls in place with adequate habitat.

California's burrowing owl population is clearly in peril and if declines continue unchecked the species may qualify for listing. Because of the intense pressure for development of open, flat grasslands in California, resource managers frequently face conflicts between owls and development projects. Owls can be affected by disturbance and habitat loss, even though there may be no direct impacts to the birds themselves or their burrows. There is often inadequate information about the presence of owls on a project site until ground disturbance is imminent. When this occurs there is usually insufficient time to evaluate impacts to owls and their habitat. The absence of standardized field survey methods impairs adequate and consistent impact assessment during regulatory review processes, which in turn reduces the possibility of effective mitigation.

These guidelines are intended to provide a decision-making process that should be implemented wherever there is potential for an action or project to adversely affect burrowing owls or the resources that support them. The process begins with a four-step survey protocol to document the presence of burrowing owl habitat, and evaluate burrowing owl use of the project site and a surrounding buffer zone. When surveys confirm occupied habitat, the mitigation measures are followed to minimize impacts to burrowing owls, their burrows and foraging habitat on the site. These guidelines emphasize maintaining burrowing owls and their resources in place rather than minimizing impacts through displacement of owls to an alternate site.

Each project and situation is different and these procedures may not be applicable in some circumstances. Finally, these are not strict rules or requirements that must be applied in all situations. They are guidelines to consider when evaluating burrowing owls and their habitat, and they suggest options for burrowing owl conservation when land use decisions are made.

Section 1 describes the four phase Burrowing Owl Survey Protocol. Section 2 contains the Mitigation Guidelines. Section 3 contains a discussion of various laws and regulations that protect burrowing owls and a list of references cited in the text.

We have submitted these documents to the California Department of Fish and Game (CDFG) for review and comment. These are untested procedures and we ask for your comments on improving their usefulness.

SECTION 1 BURROWING OWL SURVEY PROTOCOL

PHASE I: HABITAT ASSESSMENT

The first step in the survey process is to assess the presence of burrowing owl habitat on the project site including a 150-meter (approx. 500 ft.) buffer zone around the project boundary (Thomsen 1971, Martin 1973).

Burrowing Owl Habitat Description

Burrowing owl habitat can be found in annual and perennial grasslands, deserts, and scrublands characterized by low-growing vegetation (Zarn 1974). Suitable owl habitat may also include trees and shrubs if the canopy covers less than 30 percent of the ground surface. Burrows are the essential component of burrowing owl habitat: both natural and artificial burrows provide protection, shelter, and nests for burrowing owls (Henny and Blus 1981). Burrowing owls typically use burrows made by fossorial mammals, such as ground squirrels or badgers, but also may use man-made structures, such as cement culverts; cement, asphalt, or wood debris piles; or openings beneath cement or asphalt pavement.

Occupied Burrowing Owl Habitat

Burrowing owls may use a site for breeding, wintering, foraging, and/or migration stopovers. Occupancy of suitable burrowing owl habitat can be verified at a site by an observation of at least one burrowing owl, or, alternatively, its molted feathers, cast pellets, prey remains, eggshell fragments, or excrement at or near a burrow entrance. Burrowing owls exhibit high site fidelity, reusing burrows year after year (Rich 1984, Feeney 1992). A site should be assumed occupied if at least one burrowing owl has been observed occupying a burrow there within the last three years (Rich 1984).

The Phase II burrow survey is required if burrowing owl habitat occurs on the site. If burrowing owl habitat is not present on the project site and buffer zone, the Phase II burrow survey is not necessary. A written report of the habitat assessment should be prepared (Phase IV), stating the reason(s) why the area is not burrowing owl habitat.

PHASE II: BURROW SURVEY

1. A survey for-burrows and owls should be conducted by walking through suitable habitat over the entire project site and in areas within 150 meters (approx 500 ft.) of the project impact zone. This 150-meter buffer zone is included to account for adjacent burrows and foraging habitat outside the project area and impacts from factors such as noise and vibration due to heavy equipment which could impact resources outside the project area.

2. Pedestrian survey transects should be spaced to allow 100 percent visual coverage of the ground surface. The distance between transect center lines should be no more than 30 meters (approx. 100 ft.), and should be reduced to account for differences in terrain, vegetation density, and ground surface visibility. To efficiently survey projects larger than 100 acres, it is recommended that two or more surveyors conduct concurrent surveys. Surveyors should maintain a minimum distance of 50 meters (approx. 160 ft.) from any owls or occupied burrows. It is important to minimize disturbance near occupied burrows during all seasons.
3. If burrows or burrowing owls are recorded on the site, a map should be prepared of the burrow concentration areas. A breeding season survey and census (Phase III) of burrowing owls is the next step required.
4. Prepare a report (Phase IV) of the burrow survey stating whether or not burrows are present.
5. A preconstruction survey may be required by project-specific mitigations no more than 30 days prior to ground disturbing activity.

PHASE III: BURROWING OWL SURVEYS, CENSUS AND MAPPING

If the project site contains burrows that could be used by burrowing owls, then survey efforts should be directed towards determining owl presence on the site. Surveys in the breeding season are required to describe if, when, and how the site is used by burrowing owls. If no owls are observed using the site during the breeding season, a winter survey is required.

Survey Methodology

A complete burrowing owl survey consists of four site visits. During the initial site visit examine burrows for owl sign and map the locations of occupied burrows. Subsequent observations should be conducted from as many fixed points as necessary to provide visual coverage of the site using spotting scopes or binoculars. It is important to minimize disturbance near occupied burrows during all seasons. Site visits must be repeated on four separate days. Conduct these visits from two hours before sunset to one hour after or from one hour before to two hours after sunrise. Surveys should be conducted during weather that is conducive to observing owls outside their burrows. Avoid surveys during heavy rain, high winds (> 20 mph), or dense fog.

Nesting Season Survey. The burrowing owl nesting season begins as early as February 1 and continues through August 31 (Thomsen 1971, Zam 1974). The timing of nesting activities may vary with latitude and climatic conditions. If possible, the nesting season survey should be conducted during the peak of the breeding season, between April 15 and July 15. Count and map all burrowing owl sightings, occupied burrows, and burrows with owl sign. Record numbers of pairs and juveniles, and behavior such as courtship and copulation. Map the approximate territory boundaries and foraging areas if known.

Survey for Winter Residents (non-breeding owls). Winter surveys should be conducted between December 1 and January 31, during the period when wintering owls are most likely to be present. Count and map all owl sightings, occupied burrows, and burrows with owl sign.

Surveys Outside the Winter and Nesting Seasons. Positive results, (i.e., owl sightings)- outside of the above survey periods would be adequate to determine presence of owls on site. However, results of these surveys may be inadequate for mitigation planning because the numbers of owls and their pattern of distribution may change during winter and nesting seasons. Negative results during surveys outside the above periods are not conclusive proof that owls do not use the site.

Preconstruction Survey. A preconstruction survey may be required by project-specific mitigations and should be conducted no more than 30 days prior to ground disturbing activity.

PHASE IV: RESOURCE SUMMARY, WRITTEN REPORT

A report should be prepared for CDFG that gives the results of each Phase of the survey protocol, as outlined below.

Phase I: Habitat Assessment

1. Date and time of visit(s) including weather and visibility conditions; methods of survey.
2. Site description including the following information: location, size, topography, vegetation communities, and animals observed during visit(s).
3. An assessment of habitat suitability for burrowing owls and explanation.
4. A map of the site.

Phase II: Burrow Survey

1. Date and time of visits including weather and visibility conditions; survey methods including transect spacing.
2. A more detailed site description should be made during this phase of the survey protocol including a partial plant list of primary vegetation, location of nearest freshwater (on or within one mile of site), animals observed during transects.
3. Results of survey transects including a map showing the location of concentrations of burrow(s) (natural or artificial) and owl(s), if present.

Phase III: Burrowing Owl Surveys, Census and Mapping

1. Date and time of visits including weather and visibility conditions; survey methods including transect spacing.
2. Report and map the location of all burrowing owls and owl sign. Burrows occupied by owl(s) should be mapped indicating the number of owls at each burrow. Tracks, feathers, pellets, or other items (prey remains, animal scat) at burrows should also be reported.
3. Behavior of owls during the surveys should be carefully recorded (from a distance) and reported. Describe and map areas used by owls during the surveys. Although not required, all behavior is valuable to document including feeding, resting, courtship, alarm, territorial, parental, or juvenile behavior.
4. Both winter and nesting season surveys should be summarized. If possible include information regarding productivity of pairs, seasonal pattern of use, and include a map of the colony showing territorial boundaries and home ranges.
5. The historical presence of burrowing owls on site should be documented, as well as the source of such information (local bird club, Audubon society, other biologists, etc.).

Burrowing: Owl Survey Protocol

April 1993

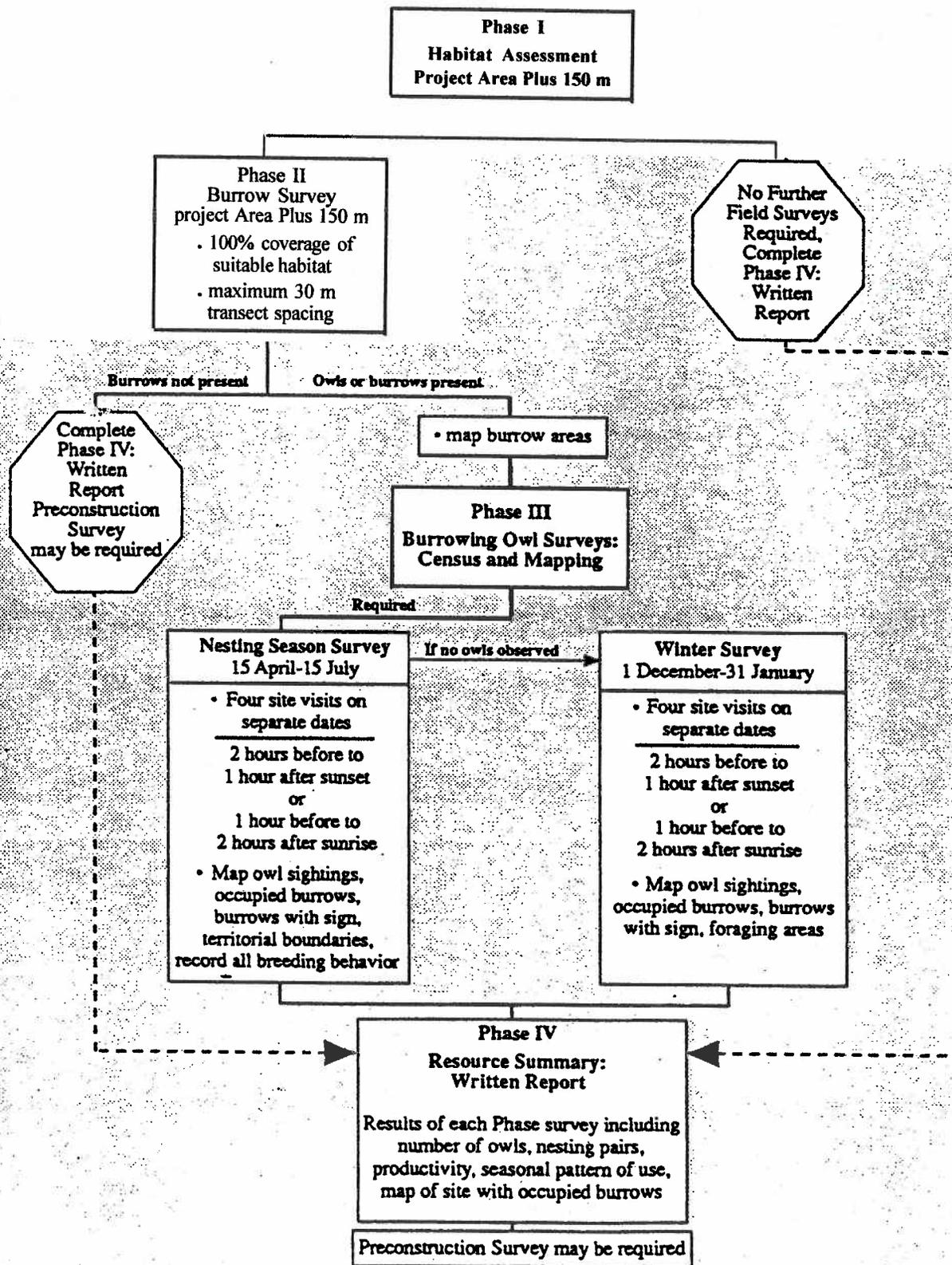


Figure 1.

SECTION 2 BURROWING OWL MITIGATION GUIDELINES

The objective of these mitigation guidelines is to minimize impacts to burrowing owls and the resources that support viable owl populations. These guidelines are intended to provide a decision-making process that should be implemented wherever there is potential for an action or project to adversely affect burrowing owls or their resources. The process begins with a four-step survey protocol (see *Burrowing Owl Survey Protocol*) to document the presence of burrowing owl habitat, and evaluate burrowing owl use of the project site and a surrounding buffer zone. When surveys confirm occupied habitat, the mitigation measures described below are followed to minimize impacts to burrowing owls, their burrows and foraging habitat on the site. These guidelines emphasize maintaining burrowing owls and their resources in place rather than minimizing impacts through displacement of owls to an alternate site.

Mitigation actions should be carried out prior to the burrowing owl breeding season, generally from February 1 through August 31 (Thomsen 1971, Zarn 1974). The timing of nesting activity may vary with latitude and climatic conditions. Project sites and buffer zones with suitable habitat should be resurveyed to ensure no burrowing owls have occupied them in the interim period between the initial surveys and ground disturbing activity. Repeat surveys should be conducted not more than 30 days prior to initial ground disturbing activity.

DEFINITION OF IMPACTS

1. Disturbance or harassment within 50 meters (approx. 160 ft.) of occupied burrows.
2. Destruction of burrows and burrow entrances. Burrows include structures such as culverts, concrete slabs and debris piles that provide shelter to burrowing owls.
3. Degradation of foraging habitat adjacent to occupied burrows.

GENERAL CONSIDERATIONS

1. Occupied burrows should not be disturbed during the nesting season, from February 1 through August 31, unless the Department of Fish and Game verifies that the birds have not begun egg-laying and incubation or that the juveniles from those burrows are foraging independently and capable of independent survival at an earlier date.
2. A minimum of 6.5 acres of foraging habitat, calculated on a 100-m (approx. 300 ft.) foraging radius around the natal burrow, should be maintained per pair (or unpaired resident single bird) contiguous with burrows occupied within the last three years (Rich 1984, Feeney 1992). Ideally, foraging habitat should be retained in a long-term conservation easement.

3. When destruction of occupied burrows is unavoidable, burrows should be enhanced (enlarged or cleared of debris) or created (by installing artificial burrows) in a ratio of 1:1 in adjacent suitable habitat that is contiguous with the foraging habitat of the affected owls.
4. If owls must be moved away from the disturbance area, passive relocation (see below) is preferable to trapping. A time period of at least one week is recommended to allow the owls to move and acclimate to alternate burrows.
5. The mitigation committee recommends monitoring the success of mitigation programs as required in Assembly Bill 3180. A monitoring plan should include mitigation success criteria and an annual report should be submitted to the California Department of Fish and Game.

AVOIDANCE

Avoid Occupied Burrows

No disturbance should occur within 50 m (approx. 160 ft.) of occupied burrows during the non-breeding Season of September 1 through January 31 or within 75 m (approx. 250 ft.) during the breeding Season of February 1 through August 31. Avoidance also requires that a minimum of 6.5 acres of foraging habitat be preserved contiguous with occupied burrow sites for each pair of breeding burrowing owls (with or without dependent young) or single unpaired resident bird (Figure 2).

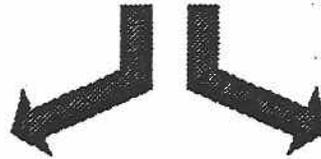
MITIGATION FOR UNAVOIDABLE IMPACTS

On-site Mitigation

On-site passive relocation should be implemented if the above avoidance requirements cannot be met. Passive relocation is defined as encouraging owls to move from occupied burrows to alternate natural or artificial burrows that are beyond 50 m from the impact zone and that are within or contiguous to a minimum of 6.5 acres of foraging habitat for each pair of relocated owls (Figure 3). Relocation of owls should only be implemented during the non-breeding season. On-site habitat should be preserved in a conservation easement and managed to promote burrowing owl use of the site.

Owls should be excluded from burrows in the immediate impact zone and within a 50 m (approx. 160 ft.) buffer zone by installing one-way doors in burrow entrances: One-way doors should be left in place 48 hours to insure owls have left the burrow before excavation. One alternate natural or artificial burrow should be provided for each burrow that will be excavated in the project impact zone. The project area should be monitored daily for one week to confirm owl use of alternate burrows before excavating burrows in the immediate impact zone. Whenever possible, burrows should be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe or burlap bags should be inserted into the tunnels

AVOIDANCE



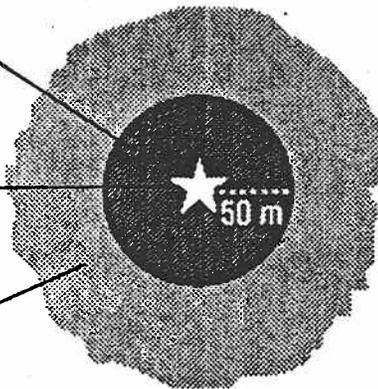
Non-breeding season

1 Sept. - 31 Jan.

No impacts within
50 m of occupied
burrow

Occupied
burrow

Maintain
at least 6.5 acres
foraging habitat



Breeding season

1 Feb. - 31 Aug.

No impacts within
75 m of occupied
burrow

Occupied
burrow

Maintain
at least 6.5 acres
foraging habitat

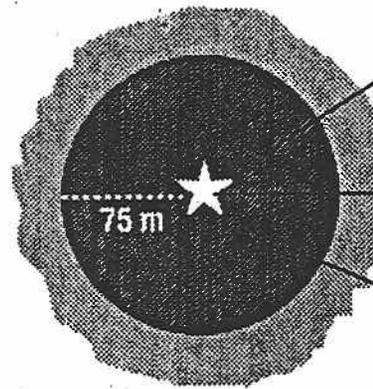


Figure 2. Burrowing owl mitigation guidelines.

ON-SITE MITIGATION IF AVOIDANCE NOT MET

(More than 6.5 acres suitable habitat available)

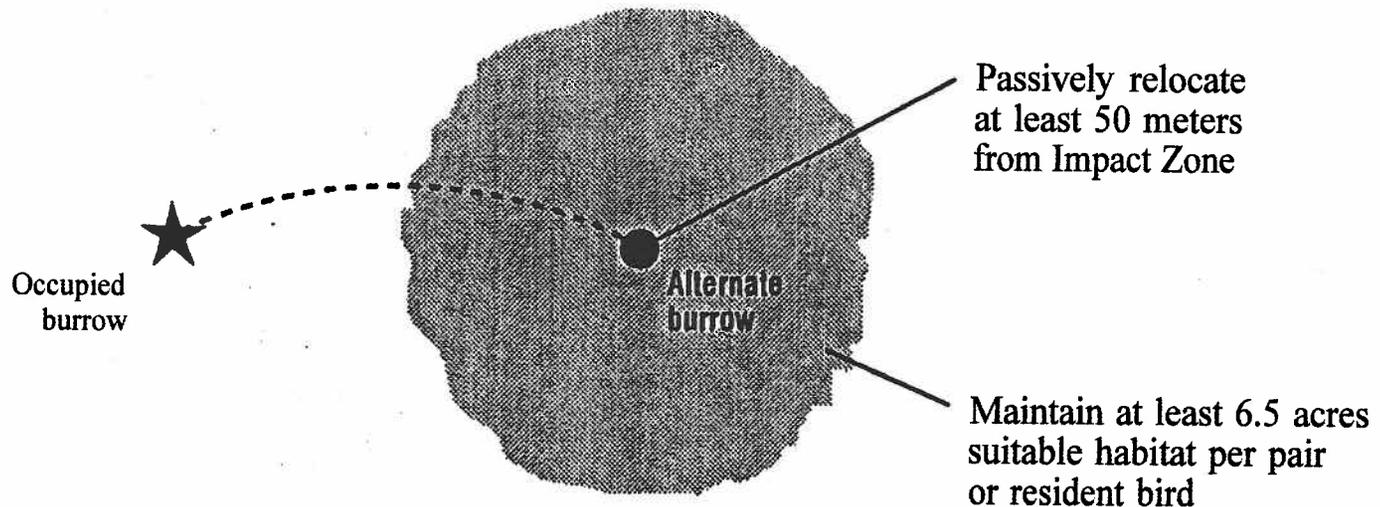


Figure 3. Burrowing owl mitigation guidelines.

during excavation to maintain an escape route for any animals inside the burrow.

Off-site Mitigation

If the project will reduce suitable habitat on-site below the threshold level of 6.5 acres per relocated pair or single bird, the habitat should be replaced off-site. Off-site habitat must be suitable burrowing owl habitat, as defined in the *Burrowing Owl Survey Protocol*, and the site approved by CDFG. Land should be purchased and/or placed in a conservation easement in perpetuity and managed to maintain suitable habitat. Off-site mitigation should use one of the following ratios:

1. Replacement of occupied habitat with occupied habitat: 1.5 times 6.5 (9.75) acres per pair or single bird.
2. Replacement of occupied habitat with habitat contiguous to currently occupied habitat: 2 times 6.5 (13.0) acres per pair or single bird.
3. Replacement of occupied habitat with suitable unoccupied habitat: 3 times 6.5 (19.5) acres per pair or single bird.

SECTION 3 LEGAL STATUS

The burrowing owl is a migratory bird species protected by international treaty under the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703-711). The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter, any migratory bird listed in 50 C.F.R. Part 10, including feathers or other parts, nests, eggs, or products, except as allowed by implementing regulations (50 C.F.R. 21). Sections 3503, 3503.5, and 3800 of the California Department of Fish and Game Code prohibit the take, possession, or destruction of birds, their nests or eggs. Implementation of the take provisions requires that project-related disturbance at active nesting territories be reduced or eliminated during critical phases of the nesting cycle (March 1 - August 15, annually). Disturbance that causes nest abandonment and/or loss of reproductive effort (e.g., killing or abandonment of eggs or young) or the loss of habitat upon which the birds depend is considered "taking" and is potentially punishable by fines and/or imprisonment. Such taking would also violate federal law protecting migratory birds (e.g., MBTA).

The burrowing owl is a Species of Special Concern to California because of declines of suitable habitat and both localized and statewide population declines. Guidelines for the Implementation of the California Environmental Quality Act (CEQA) provide that a species be considered as endangered or "rare" regardless of appearance on a formal list for the purposes of the CEQA (Guidelines, Section 15380, subsections b and d). The CEQA requires a mandatory findings of significance if impacts to threatened or endangered species are likely to occur (Sections 21001(c), 21083. Guidelines 15380, 15064, 15065). Avoidance or mitigation must be presented to reduce impacts to less than significant levels.

CEQA AND SUBDIVISION MAP ACT

CEQA Guidelines Section 15065 directs that a mandatory finding of significance is required for projects that have the potential to substantially degrade or reduce the habitat of, or restrict the range of a threatened or endangered species. CEQA requires agencies to implement feasible mitigation measures or feasible alternatives identified in EIR's for projects which will otherwise cause significant adverse impacts (Sections 21002, 21081, 21083; Guidelines, sections 15002, subd. (a)(3), 15021, subd. (a)(2), 15091, subd. (a).).

To be legally adequate, mitigation measures must be capable of "avoiding the impact altogether by not taking a certain action or parts of an action"; "minimizing impacts by limiting the degree or magnitude of the action and its implementation"; "rectifying the impact by repairing, rehabilitating or restoring the impacted environment"; "or reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action." (Guidelines, Section 15.370).

Section 66474 (e) of the Subdivision Map Act states "a legislative body of a city or county shall deny approval of a tentative map or parcel map for which a tentative map was not required, if

it makes any of the following findings:... (e) that the design of the subdivision or the proposed improvements are likely to cause substantial environmental damage or substantially and avoidably injure fish and wildlife or their habitat". In recent court cases, the court upheld that Section 66474(e) provides for environmental impact review separate from and independent of the requirements of CEQA (Topanga Assn. for a Scenic Community v. County of Los Angeles, 263 Cal. Rptr. 214 (1989).). The finding in Section 66174 is in addition to the requirements for the preparation of an EIR or Negative Declaration.

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APPENDIX J

Staff Report Regarding Mitigation

for Impacts to Swainson's Hawk

(CDFG 1994)



**Staff Report regarding Mitigation
for Impacts to Swainson's Hawks (*Buteo swainsoni*
in the Central Valley of California**

The Legislature and the Fish and Game Commission have developed the policies, standards and regulatory mandates which, if implemented, are intended to help stabilize and reverse dramatic population declines of threatened and endangered species. In order to determine how the Department of Fish and Game (Department) could judge the adequacy of mitigation measures designed to offset impacts to Swainson's hawks in the Central Valley, Staff (WMD, ESD and Regions) has prepared this report. To ensure compliance with legislative and Commission policy, mitigation requirements which are consistent with this report should be incorporated into: (1) Department comments to Lead Agencies and project sponsors pursuant to the California Environmental Quality Act (CEQA); (2) Fish and Game Code Section 2081 Management Authorizations (Management Authorizations); and (3) Fish and Game Code Section 2090 Consultations with State CEQA Lead Agencies.

The report is designed to provide the Department (including regional offices and divisions), CEQA Lead Agencies and project proponents the context in which the Environmental Services Division (ESD) will review proposed project specific mitigation measures. This report also includes "model" mitigation measures which have been judged to be consistent with policies, standards and legal mandates of the Legislature and Fish and Game Commission. Alternative mitigation measures, tailored to specific projects, may be developed if consistent with this report are intended to help achieve the conservation goals for the Swainson's hawk and should complement multi-species habitat conservation planning efforts currently underway.

The Department is preparing a recovery plan for the species and it is anticipated that this report will be revised to incorporate recovery plan goals. It is anticipated that the recovery plan will be completed by the end of 1995. The Swainson's hawk recovery plan will establish criteria for species recovery through preservation of existing habitat, population expansion into former habitat, recruitment of young into the population, and other specific recovery efforts.

During project review the Department should consider whether a proposed project will adversely affect suitable foraging habitat within a ten (10) mile radius of an active (used during one or more of the last 5 years) Swainson's hawk nest(s). Suitable Swainson's hawk foraging habitat will be those habits and crops identified in

Bechard (1983), Bloom (1980), and Estep (1989). The following vegetation types/agricultural crops are considered small mammal and insect foraging habitat for Swainson's hawks:

- alfalfa
- fallow fields
- beet, tomato, and other low-growing row or field crops
- dry-land and irrigated pasture
- rice land (when not flooded)
- cereal grain crops (including corn after harvest)

The ten mile radius standard is the flight distance between active (and successful) nest sites and suitable foraging habitats, as documented in telemetry studies (Estep 1989, Babcock 1993). Based on the ten mile radius, new development projects which adversely modify nesting and/or foraging habitat should mitigate the project's impacts to the species. The ten mile foraging radius recognizes a need to strike a balance between the biological needs of reproducing pairs (including eggs and nestlings) and the economic benefit of development(s) consistent with Fish and game Code Section 2053.

Since over 95% of Swainson's hawk nests occur on private land, the Department's mitigation program should include incentives that preserve agricultural lands used for the production of crops, which are compatible with Swainson's hawk foraging needs, while providing an opportunity for urban development and other changes in land use adjacent to existing urban areas.

LEGAL STATUS

Federal

The Swainson's hawk is a migratory bird species protected under the Migratory Bird Treaty Act (MBTA) of 1918 (16 U.S.C. 703-711). The MBTA makes it unlawful to take, possess, buy, sell, purchase, or barter any migratory bird listed in Section 50 of the Code of Federal Regulations (C.F.R.) Part 10, including feathers or other parts, nests, eggs or products, except as allowed by implementing regulations (50 C.F.R. 21).

State

The Swainsons' hawk has been listed as a threatened species by the California Fish and Game Commission pursuant to the California Endangered Species Act (CESA), see Title 14, California Code of Regulations, Section 670.5(b)(5)(A).

**LEGISLATIVE AND COMMISSION POLICIES
LEGAL MANDATES AND STANDARDS**

The FGC policy for threatened species is, in part, to: "Protect and preserve all native species...and their habitats..." This policy also directs the Department to work with all interested persons to protect and preserve sensitive resources and their habitats. Consistent with this policy and direction, the Department is enjoined to implement measures that assure protection for the Swainson's hawk.

The California State Legislature, when enacting the provisions of CESA, made the following findings and declarations in Fish and Game Code Section 2051:

a)"Certain species of fish, wildlife, and plants have been rendered extinct as a consequence of man's activities, untempered by adequate concern and conservation";

b)"Other species of fish, wildlife, and plants are in danger of, or threatened with, extinction because their habitats are threatened with destruction, adverse modification, or severe curtailment because of overexploitation, disease, predation, or other factors (emphasis added)"; and

c)"These species of fish, wildlife, and plants are of ecological, educational, historical, recreational, esthetic, economic, and scientific value to the people of this state, and the conservation, protection, and enhancement of these species and their habitat is of statewide concern" (emphasis added).

The Legislature also proclaimed that it "is the policy of the state to conserve, protect, restore, and enhance any endangered or threatened species and its habitat and that it is the intent of the Legislature, consistent with conserving the species, to acquire lands for habitat for these species" (emphasis added).

Section 2053 of the Fish and Game Code states, in part, "it is the policy of the state that state agencies should not approve projects as proposed which would jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat essential to the continued existence of those species, if there are reasonable and prudent alternatives available consistent with conserving the species and or its habitat which would prevent jeopardy" (emphasis added).

Section 2054 states "The Legislature further finds and declares that, in the event specific economic, social, and or other conditions make infeasible such alternatives, individual projects may be approved if appropriate mitigation and enhancement measures are provided" (emphasis added).

Loss or alteration of foraging habitat or nest site disturbance which results in: (1) nest abandonment; (2) loss of young; (3) reduced health and vigor of eggs and/or nestlings (resulting in reduced survival rates), may ultimately result in the take (killing) of nestling or fledgling Swainson's hawks incidental to otherwise lawful activities. The taking of Swainson's hawks in this manner can be a violation of Section 2080 of the Fish and Game Code. This interpretation of take has been judicially affirmed by the landmark appellate court decision pertaining to CESA (DFG v. ACID, 8 CA App.4, 41554). The essence of the decision emphasized that the intent and purpose of CESA applies to all activities that take or kill endangered or threatened species, even when the taking is incidental to otherwise legal activities. To avoid potential violations of Fish and Game Code Section 2080, the Department recommends and encourages project sponsors to obtain 2081 Management Authorizations for their projects.

Although this report has been prepared to assist the Department in working with the development community, the prohibition against take. (Fish and Game Code Section 2080) applies to all persons, including those engaged in agricultural activities and routine maintenance of facilities. In addition, sections 3503, 3503.5, and 3800 of the Fish and Game Code prohibit the take, possession, or destruction of birds, their nests or eggs.

To avoid potential violation of Fish and Game Section 2080 (i.e. killing of a listed species), project-related disturbance at active Swainson's hawk nesting sites should be reduced or eliminated during critical phases of the nesting cycle (March 1 - September 15 annually). Delineation of specific activities which could cause nest abandonment (take) of Swainson's hawk during the nesting period should be done on a case-by-case basis.

CEQA requires a mandatory findings of significance if a project's impacts to threatened or endangered species are likely to occur (Sections 21001 (c), 21083, Guidelines Sections 15380, 15064, 15065). Impacts must be avoided or mitigated to less than significant levels unless the CEQA Lead Agency makes and supports findings of Overriding Consideration. The CEQA Lead Agency's Findings of Overriding Consideration does not eliminate the project sponsor's obligation to comply with Fish and Game Code Section 2080.

NATURAL HISTORY

The Swainson' hawk (*Buteo swainsoni*) is a large, broad winged buteo which frequents open country. They are about the same size as a red-tailed hawk (*Buteo jamaicensis*), but trimmer, weighing approximately 800-1100 grams (1.75 - 2 lbs.). They have about a 125 cm. (4+foot) wingspan. The basic body plumage may be highly variable and is characterized by several color morphs - light, dark, and rufous. In dark phase birds, the entire body of the bird may be sooty black. Adult birds generally have dark backs. The ventral or underneath sections may be light with a characteristic dark, wide "bib" from the lower throat down to the upper breast, light colored wing linings and pointed wing tips. The tail is gray ventrally with a subterminal dusky band, and narrow, less conspicuous barring proximally. The sexes are similar in appearance; females however, are slightly larger and heavier than males, as is the case in most sexually dimorphic raptors. There are not recognized subspecies (Palmer 1988).

The Swainson's hawk is a long distance migrator. The nesting grounds occur in northwestern Canada, the western U.S., and Mexico and most populations migrate to wintering grounds in the open pampas and agricultural areas of South America (Argentina, Uruguay, southern Brazil). The species is included among the group of birds known as "neotropical migrants". Some individuals or small groups (20-30 birds) may winter in the U.S., including California (Delta Islands). This round trip journey may exceed 14,000 miles. The birds return to the nesting grounds and establish nesting territories in early March.

Swainson's hawks are monogamous and remain so until the loss of a mate (Palmer 1988). Nest construction and courtship continues through April. The clutch (commonly 3-5 eggs) is generally laid in early April to early May, but may occur later. Incubation lasts 34-35 days, with both parents participating in the brooding of eggs and young. The young fledge (leave the nest) approximately 42-44 days after hatching and remain with their parents until they depart in the fall. Large groups (up to 100+ birds) may congregate in holding areas in the fall and may exhibit a delayed migration depending upon forage availability. The specific purpose of these congregation areas is as yet unknown, but is likely related to: increasing energy reserves for migration; the timing of migration; aggregation into large migratory groups (including assisting the young in learning migration routes); and providing a pairing and courtship opportunity for unattached adults.

Foraging Requirements

Swainson's hawk nests in the Central Valley of California are generally found in scattered trees or along riparian systems adjacent to agricultural fields or pastures. These open fields and pastures are the primary foraging areas. Major prey items for Central Valley birds include: California voles (*Microtus californicus*), valley pocket gophers (*Thomomys bottae*), deer mice (*Peromyscus maniculatus*), California ground squirrels (*Spermophilus beecheyi*), meadowlarks (*Sturnella neglecta*), other passerines, grasshoppers (*Conocephalinae sp.*), crickets (*Gryllidae sp.*), and beetles (Estep 1989). Swainson's hawks generally search for prey by soaring in open country and agricultural fields similar to northern harriers (*Circus cyaneus*) and ferruginous hawks (*Buteo regalis*). Often several hawks may be seen foraging together following tractors or other farm equipment capturing prey escaping from farming operations. During the breeding season, Swainson's hawks eat mainly vertebrates (small rodents and reptiles), whereas during migration vast numbers of insects are consumed (Palmer 1988).

Department funded research has documented the importance of suitable foraging habitats (e.g., annual grasslands, pasture lands, alfalfa and other hay crops, and combinations of hay, grain and row crops) within an energetically efficient flight distance from active Swainson's hawk nests (Estep pers. comm.). Recent telemetry studies to determine foraging requirements have shown that birds may use in excess of 15,000 acres of habitat or range up to 18.0 miles from the nest in search of prey (Estep 1989, Babcock 1993). The prey base (availability and abundance) for the species is highly variable from year to year, with major prey population (small mammals and insects) fluctuations occurring based on rainfall patterns, natural cycles and agricultural cropping and harvesting patterns. Based on these variables, significant acreages of potential foraging habitat (primarily agricultural lands) should be preserved per nesting pair (or aggregation of nesting pairs) to avoid jeopardizing existing populations. Preserved foraging areas should be adequate to allow additional Swainson's hawk nesting pairs to successfully breed and use the foraging habitat during good prey production years.

Suitable foraging habitat is necessary to provide an adequate energy source for breeding adults, including support of nestlings and fledglings. Adults must achieve an energy balance between the needs of themselves and the demands of nestlings and fledglings, or the health and survival of both may be jeopardized. If prey resources are not sufficient, or if adults must hunt long distances from the nest site, the energetics of the foraging effort may

result in reduced nestling vigor with an increased likelihood of disease and/or starvation. In more extreme cases, the breeding pair, in an effort to assure their own existence, may even abandon the nest and young (Woodbridge 1985).

Prey abundance and availability is determined by land and farming patterns including crop types, agricultural practices and harvesting regimes. Estep (1989) found that 73.4 % of observed prey captures were in fields being harvested, disced, mowed, or irrigated. Preferred foraging habitats for Swainson's hawks include:

- alfalfa;
- fallow fields;
- beet, tomato, and other low-growing row or field crops;
- dry-land and irrigated pasture;
- rice land (during the non-flooded period); and
- cereal grain crops (including corn after harvest).

Unsuitable foraging habitat types include crops where prey species (even if present) are not available due to vegetation characteristics (e.g. vineyards, mature orchards, and cotton fields, dense vegetation).

Nesting Requirements

Although the Swainson's hawk's current nesting habitat is fragmented and unevenly distributed, Swainson's hawks nest throughout most of the Central Valley floor. More than 85% of the known nests in the Central Valley are within riparian systems in Sacramento, Sutter, Yolo, and San Joaquin counties. Much of the potential nesting habitat remaining in this area is in riparian forests, although isolated and roadside trees are also used. Nest sites are generally adjacent to or within easy flying distance to alfalfa or hay fields or other habitats or agricultural crops which provide an abundant and available prey source. Department research has shown that valley oaks (*Quercus lobata*), Fremont's cottonwood (*Populus fremontii*), willows (*Salix spp.*), sycamores (*Platanus spp.*), and walnuts (*Juglans spp.*) are the preferred nest trees for Swainson's hawks (Bloom 1980, Schlorff and Bloom 1983, Estep 1989).

Fall and Winter Migration Habitats

During their annual fall and winter migration periods, Swainson's hawks may congregate in large groups (up to 100+ birds). Some of these sites may be used during delayed migration periods lasting up to three months. Such sites have been identified in Yolo, Tulare, Kern and San Joaquin counties and protection is needed for these

critical foraging areas which support birds during their long migration.

Historical and Current Population Status

The Swainson's hawk was historically regarded as one of the most common and numerous raptor species in the state, so much so that they were often not given special mention in field notes. The breeding population has declined by an estimated 91% in California since the turn of the century (Bloom 1980). The historical Swainson's hawk population estimates are based on current densities and extrapolated based on the historical amount of available habitat. The historical population estimate is 4,284-17,136 pairs (Bloom 1980). In 1979, approximately 375 (± 50) breeding pairs of Swainson's hawks were estimated in California, and 280 (75%) of those pairs were estimated to be in the Central Valley (Bloom 1980). In 1988, 241 active breeding pairs were found in the Central Valley, with an additional 78 active pairs known in northeastern California. The 1989 population estimate was 430 pairs for the Central Valley and 550 pairs statewide (Estep, 1989). This difference in population estimates is probably a result of increased survey effort rather than an actual population increase.

Reasons for decline

The dramatic Swainson's hawk population decline has been attributed to loss of native nesting and foraging habitat, and more recently to the loss of suitable nesting trees and the conversion of agricultural lands. Agricultural lands have been converted to urban land uses and incompatible crops. In addition, pesticides, shooting, disturbance at the nest site, and impacts on wintering areas may have contributed to their decline. Although losses on the wintering areas in South America may occur, they are not considered significant since breeding populations outside of California are stable. The loss of nesting habitat within riparian areas has been accelerated by flood control practices and bank stabilization programs. Smith (1977) estimated that in 1850 over 770,000 acres of riparian habitat were present in the Sacramento Valley. By the mid-1980s, Warner and Hendrix (1984) estimated that there was only 120,000 acres of riparian habitat remaining in the central Valley (Sacramento and San Joaquin Valleys combined). Based on Warner and Hendrix's estimates approximately 93% of the San Joaquin Valley and 73% of the Sacramento Valley riparian habitat has been eliminated since 1850.

MANAGEMENT STRATEGIES

Management and mitigation strategies for the Central Valley

population of the Swainson's hawk should ensure that:

suitable nesting habitat continues to be available (this can be accomplished by protecting existing nesting habitat from destruction or disturbance and by increasing the number of suitable nest trees); and

foraging habitat is available during the period of the year when Swainson's hawks are present in the Central Valley (this should be accomplished by maintaining or creating adequate and suitable foraging habitat in areas of existing and potential nest sites and along migratory routes within the state).

A key to the ultimate success in meeting the Legislature's goal of maintaining habitat sufficient to preserve this species is the implementation of these management strategies in cooperation with project sponsors and local, state and federal agencies.

**DEPARTMENT'S ROLES AND RESPONSIBILITIES IN
PROJECT CONSULTATION AND ADMINISTRATION
OF CEQA AND THE FISH AND GAME CODE**

The Department, through its administration of the Fish and Game Code and its trust responsibilities, should continue its efforts to minimize further habitat destruction and should seek mitigation to offset unavoidable losses by (1) including the mitigation measures in this document in CEQA comment letters and/or as management conditions in Department issued Management Authorizations or (2) by developing project specific mitigation measures (consistent with the Commission's and the Legislature's mandates) and including them in CEQA comment letters and/or as management conditions in Fish and Game Code Section 2081 Management Authorizations issued by the Department and/or in Fish and Game Code Section 2090 Biological Opinions.

The Department should submit comments to CEQA Lead Agencies on all projects which adversely affect Swainson's hawks. CEQA requires a mandatory findings of significance if a project's impacts to threatened or endangered species are likely to occur (Sections 21001 {c}, 21083. Guidelines 15380, 15064, 15065). Impacts must be: (1) avoided; or (2) appropriate mitigation must be provided to reduce impacts to less than significant levels; or (3) the lead agency must make and support findings of overriding consideration. If the CEQA Lead Agency makes a Finding of Overriding Consideration, it does not eliminate the project sponsor's obligation to comply with the take prohibitions of Fish and Game Code Section 2080. Activities which result in (1) nest abandonment; (2) starvation of young; and/or (3) reduced health and

vigor of eggs and nestlings may result in the take (killing) of Swainson's hawks incidental to otherwise lawful activities (urban development, recreational activities, agricultural practices, levee maintenance and similar activities. The taking of Swainson's hawk in this manner may be a violation of Section 2080 of the Fish and Game Code. To avoid potential violations of Fish and Game Code Section 2080, the Department should recommend and encourage project sponsors to obtain 2081 Management Authorizations.

In aggregate, the mitigation measures incorporated into CEQA comment letters and/or 2081 Management Authorizations for a project should be consistent with Section 2053 and 2054 of the Fish and Game Code. Section 2053 states, in part, "it is the policy of the state that state agencies should not approve projects as proposed which would jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of habitat essential to the continued existence of those species, if there are reasonable and prudent alternatives available consistent with conserving the species and or its habitat which would prevent jeopardy". Section 2054 states: "The Legislature further finds and declares that, in the event specific economic, social, and or other conditions make infeasible such alternative, individual projects may be approved if appropriate mitigation and enhancement measures are provided."

State lead agencies are required to consult with the Department pursuant to Fish and Game Code Section 2090 to ensure that any action authorized, funded, or carried out by that state agency will not jeopardize the continued existence of any threatened or endangered species. Comment letters to State Lead Agencies should also include a reminder that the State Lead Agency has the responsibility to consult with the Department pursuant to Fish and Game Code Section 2090 and obtain a written findings (Biological Opinion). Mitigation measures included in Biological Opinions issued to State Lead Agencies must be consistent with Fish and Game Code Sections 2051-2054 and 2091-2092.

NEST SITE AND HABITAT LOCATION INFORMATION SOURCES

The Department's Natural Diversity Data Base (NDDB) is a continually updated, computerized inventory of location information on the State's rarest plants, animals, and natural communities. Department personnel should encourage project proponents and CEQA Lead Agencies, either directly or through CEQA comment letters, to purchase NDDB products for information on the locations of Swainson's hawk nesting areas as well as other sensitive species. The Department's Nongame Bird and Mammal Program also maintains

information on Swainson's hawk nesting areas and may be contacted for additional information on the species.

Project applicants and CEQA Lead Agencies may also need to conduct site specific surveys (conducted by qualified biologists at the appropriate time of the year using approved protocols) to determine the status (location of nest sites, foraging areas, etc.) of listed species as part of the CEQA and 2081 Management Authorization process. Since these studies at the earliest possible time in the project review process. To facilitate project review and reduce the potential for costly project delays, the Department should make it a standard practice to advise developers or others planning projects that may impact one or more Swainson's hawk nesting or foraging areas to initiate communication with the Department as early as possible.

MANAGEMENT CONDITIONS

Staff believes the following mitigation measures (nos. 1-4) are adequate to meet the Commission's and Legislature's policy regarding listed species and are considered as preapproved for incorporation into any Management Authorizations for the Swainson's hawk issued by the Department. The incorporation of measures 1.4 into a CEQA document should reduce a project's impact to a Swainson's hawk(s) to less than significant levels. Since these measures are Staff recommendations, a project sponsor or CEQA Lead agency may choose to negotiated Management Conditions must be consistent with Commission and Legislative policy and be submitted to the ESD for review and approval prior to reaching agreement with the project sponsor or CEQA Lead Agency.

Staff recommended Management Conditions are:

1. No intensive new disturbances (e.g. heavy equipment operation associated with construction, use of cranes or draglines, new rock crushing activities) or other project related activities which may cause nest abandonment or forced fledging, should be initiated within 1/4 mile (buffer zone) of an active nest between March 1 - September 15 or until August 15 if a Management Authorization or Biological Opinion is obtained for the project. The buffer zone should be increased to 1/2 mile in nesting areas away from urban development (i.e. in areas where disturbance [e.g. heavy equipment operation associated with construction, use of cranes or draglines, new rock crushing activities] is not a normal occurrence during the nesting season). Nest trees should not be removed, a Management Authorization (including conditions to off-set the loss of the nest tree) must be obtained with the tree removal

period specified in the Management Authorization, generally between October 1 - February 1. If construction or other project related activities which may cause nest abandonment or forced fledging are necessary within the buffer zone, monitoring of the nest site (funded by the project sponsor) by a qualified biologist (to determine if the nest is abandoned) should be required. If it is abandoned and if the nestlings are still alive, the project sponsor shall fund the recovery and hacking (controlled release of captive reared young) of the nestling(s). Routine disturbances such as agricultural activities, commuter traffic, and routine facility maintenance activities within 1/4 mile of an active nest should not be prohibited.

2. Hacking as a substitute for avoidance of impacts during the nesting period may be used in unusual circumstances after review and approval of a hacking plan by ESD and WMD. Proponents who propose using hacking will be required to fund the full costs of the effort, including any telemetry work specified by the Department.

3. To mitigate for the loss of foraging habitat (as specified in this document), the Management Authorization holder/project sponsor shall provide Habitat Management (HM) lands to the Department based on the following ratios:

(a) Projects within 1 mile of an active nest tree shall provide:

one acre of HM land (at least 10% of the HM land requirements shall be met by fee title acquisition or a conservation easement allowing for the active management of the habitat, with the remaining 90% of the HM lands protected by a conservation easement [acceptable to the Department] on agricultural lands or other suitable habitats which provide foraging habitat for Swainson's hawk) for each acre of development authorized (1:1 ratio); or

one-half acre of HM land (all of the HM land requirements shall be met by fee title acquisition or a conservation easement [acceptable to the Department] which allows for the active management of the habitat for prey production on the HM lands) for each acre of development authorized (0.5:1 ratio).

(b) Projects within 5 miles of an active nest tree but greater than 1 mile from the nest tree shall provide 0.75 acres of HM

land for each acre of urban development authorized (0.75:1 ratio). All HM lands protected under this requirement may be protected through fee title acquisition or conservation easement (acceptable to the Department) on agricultural lands or other suitable habitats which provide foraging habitat for Swainson's hawk.

(c) Projects within 10 miles of an active nest tree but greater than 5 miles from an active nest tree shall provide 0.5 acres of HM land for each acre of urban development authorized (0.5:1 ratio). All HM lands protected under this requirement may be protected through fee title acquisition or a conservation easement (acceptable to the Department) on agricultural lands or other suitable habitats which provide foraging habitat for Swainson's hawk.

4. Management Authorization holders/project sponsors shall provide for the long-term management of the HM lands by funding a management endowment (the interest on which shall be used for managing the HM lands) at the rate of \$400 per HM land acre (adjusted annually for inflation and varying interest rates).

Some project sponsors may desire to provide funds to the Department for HM land protection. This option is acceptable to the extent the proposal is consistent with Department policy regarding acceptance of funds for land acquisition. All HM lands should be located in areas which are consistent with a multi-species habitat conservation focus. Management Authorization holders/project sponsors who are willing to establish a significant mitigation bank (>900 acres) should be given special consideration such as 1.1 acres of mitigation credit for each acre preserved.

PROJECT SPECIFIC MITIGATION MEASURES

Although this report includes recommended Management Measures, the Department should encourage project proponents to propose alternative mitigation strategies that provide equal or greater protection of the species and which also expedite project environmental review or issuance of a CESA Management Authorization. The Department and sponsor may choose to conduct cooperative, multi-year field studies to assess the site's habitat value and determine its use by nesting and foraging Swainson's hawk. Study plans should include clearly defined criteria for judging the project's impacts on Swainson's hawks and the methodologies (days of monitoring, foraging effort/efficiency, etc.) that will be used.

The study plans should be submitted to the Wildlife Management Division and ESD for review. Mitigation measures developed as a result of the study must be reviewed by ESD (for consistency with the policies of the Legislature and Fish and Game Commission) and approved by the Director.

EXCEPTIONS

Cities, counties and project sponsors should be encourage to focus development on open lands within already urbanized areas. Since small disjunct parcels of habitat seldom provide foraging habitat needed to sustain the reproductive effort of a Swainson's hawk pair, Staff does not recommend requiring mitigation pursuant to CEQA nor a Management Authorization by the Department for infill (within an already urbanized area) projects in areas which have less than 5 acres of foraging habitat and are surrounded by existing urban development, unless the project area is within 1/4 mile of an active nest tree.

REVIEW

Staff should revise this report at least annually to determine if the proposed mitigation strategies should be retained, modified or if additional mitigation strategies should be included as a result of new scientific information.

APPENDIX K

Recommended Timing and Methodology for Swainson's

Hawk Nesting Surveys in California's Central Valley

(Swainson's Hawk Technical Advisory Committee 2000)



RECOMMENDED TIMING AND METHODOLOGY FOR SWAINSON'S HAWK NESTING SURVEYS IN CALIFORNIA'S CENTRAL VALLEY

Swainson's Hawk Technical Advisory Committee

May 31, 2000

This set of survey recommendations was developed by the Swainson's Hawk Technical Advisory Committee (TAC) to maximize the potential for locating nesting Swainson's hawks, and thus reducing the potential for nest failures as a result of project activities/disturbances. The combination of appropriate surveys, risk analysis, and monitoring has been determined to be very effective in reducing the potential for project-induced nest failures. As with most species, when the surveyor is in the right place at the right time, Swainson's hawks may be easy to observe; but some nest sites may be very difficult to locate, and even the most experienced surveyors have missed nests, nesting pairs, mis-identified a hawk in a nest, or believed incorrectly that a nest had failed. There is no substitute for specific Swainson's hawk survey experience and acquiring the correct search image.

METHODOLOGY

Surveys should be conducted in a manner that maximizes the potential to observe the adult Swainson's hawks, as well as the nest/chicks second. To meet the California Department of Fish and Game's (CDFG) recommendations for mitigation and protection of Swainson's hawks, surveys should be conducted for a ½ mile radius around all project activities, and if active nesting is identified within the ½ mile radius, consultation is required. In general, the TAC recommends this approach as well.

Minimum Equipment

Minimum survey equipment includes a high-quality pair of binoculars and a high quality spotting scope. Surveying even the smallest project area will take hours, and poor optics often result in eye-strain and difficulty distinguishing details in vegetation and subject birds. Other equipment includes good maps, GPS units, flagging, and notebooks.

Walking vs Driving

Driving (car or boat) or "windshield surveys" are usually preferred to walking if an adequate roadway is available through or around the project site. While driving, the observer can typically approach much closer to a hawk without causing it to fly. Although it might appear that a flying bird is more visible, they often fly away from the observer using trees as screens; and it is difficult to determine from where a flying bird came. Walking surveys are useful in locating a nest after a nest territory is identified, or when driving is not an option.

Angle and Distance to the Tree

Surveying subject trees from multiple angles will greatly increase the observer's chance of detecting a nest or hawk, especially after trees are fully leafed and when surveying multiple trees

in close proximity. When surveying from an access road, survey in both directions. Maintaining a distance of 50 meters to 200 meters from subject trees is optimal for observing perched and flying hawks without greatly reducing the chance of detecting a nest/young: Once a nesting territory is identified, a closer inspection may be required to locate the nest.

Speed

Travel at a speed that allows for a thorough inspection of a potential nest site. Survey speeds should not exceed 5 miles per hour to the greatest extent possible. If the surveyor must travel faster than 5 miles per hour, stop frequently to scan subject trees.

Visual and Aural Ques

Surveys will be focused on both observations and vocalizations. Observations of nests, perched adults, displaying adults, and chicks during the nesting season are all indicators of nesting Swainson's hawks. In addition, vocalizations are extremely helpful in locating nesting territories. Vocal communication between hawks is frequent during territorial displays; during courtship and mating; through the nesting period as mates notify each other that food is available or that a threat exists; and as older chicks and fledglings beg for food.

Distractions

Minimize distractions while surveying. Although two pairs of eyes may be better than one pair at times, conversation may limit focus. Radios should be off, not only are they distracting, they may cover a hawk's call.

Notes and Species Observed

Take thorough field notes. Detailed notes and maps of the location of observed Swainson's hawk nests are essential for filling gaps in the Natural Diversity Data Base; please report all observed nest sites. Also document the occurrence of nesting great homed owls, red-tailed hawks, red-shouldered hawks and other potentially competitive species. These species will infrequently nest within 100 yards of each other, so the presence of one species will not necessarily exclude another.

TIMING

To meet the **minimum level** of protection for the species, surveys should be completed for at least the two survey periods immediately prior to a project's initiation. For example, if a project is scheduled to begin on June 20, you should complete 3 surveys in Period III and 3 surveys in Period V. However, it is always recommended that surveys be completed in Periods II, III and V. **Surveys should not be conducted in Period IV.**

The survey periods are defined by the timing of migration, courtship, and nesting in a "typical" year for the majority of Swainson's hawks from San Joaquin County to Northern Yolo County. Dates should be adjusted in consideration of early and late nesting seasons, and geographic differences (northern nesters tend to nest slightly later, etc). If you are not sure, contact a TAC member or CDFG biologist.

Survey dates Justification and search image	Survey time	Number of Surveys
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I. <i>January-March 20 (recommended optional)</i>	<i>All day</i>	<i>1</i>
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Prior to Swainson's hawks returning, it may be helpful to survey the project site to determine potential nest locations. Most nests are easily observed from relatively long distances, giving the surveyor the opportunity to identify potential nest sites, as well as becoming familiar with the project area. It also gives the surveyor the opportunity to locate and map competing species nest sites such as great homed owls from February on, and red-tailed hawks from March on. After March 1, surveyors are likely to observe Swainson's hawks staging in traditional nest territories.

II. <i>March 20 to April 5</i>	<i>Sunrise to 1000 1600 to sunset</i>	<i>3</i>
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Most Central Valley Swainson's hawks return by April 1, and immediately begin occupying their traditional nest territories. For those few that do not return by April 1, there are often hawks ("floaters") that act as place-holders in traditional nest sites; they are birds that do not have mates, but temporarily attach themselves to traditional territories and/or one of the site's "owners." Floaters are usually displaced by the territories' owner(s) if the owner returns.

Most trees are leafless and are relatively transparent; it is easy to observe old nests, staging birds, and competing species. The hawks are usually in their territories during the survey hours, but typically soaring and foraging in the mid-day hours. Swainson's hawks may often be observed involved in territorial and courtship displays, and circling the nest territory. Potential nest sites identified by the observation of staging Swainson's hawks will usually be active territories during that season, although the pair may not successfully nest/reproduce that year.

III. <i>April 5 to April 20</i>	<i>Sunrise to 1200 1630 to Sunset</i>	<i>3</i>
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Although trees are much less transparent at this time, activity at the nest site increases significantly. Both males and females are actively nest building, visiting their selected site frequently. Territorial and courtship displays are increased, as is copulation. The birds tend to vocalize often, and nest locations are most easily identified. This period may require a great deal of "sit and watch" surveying.

IV. <i>April 21 to June 10</i>	<i>Monitoring known nest sites only Initiating Surveys is not recommended</i>	
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Nests are extremely difficult to locate this time of year, and even the most experienced surveyor will miss them, especially if the previous surveys have not been done. During this phase of nesting, the female Swainson's hawk is in brood position, very low in the nest, laying eggs, incubating, or protecting the newly hatched and vulnerable chicks; her head may or may not be visible. Nests are often well-hidden, built into heavily vegetated sections of trees or in clumps of mistletoe, making them all but invisible. Trees are usually not viewable from all angles, which may make nest observation impossible.

Following the male to the nest may be the only method to locate it, and the male will spend hours away from the nest foraging, soaring, and will generally avoid drawing attention to the nest site. Even if the observer is fortunate enough to see a male returning with food for the female, if the female determines it is not safe she will not call the male in, and he will not approach the nest; this may happen if the observer, or others, are too close to the nest or if other threats, such as rival hawks, are apparent to the female or male.

V. June 10 to July 30 (post-fledging)

Sunrise to 1200

3

1600 to sunset

Young are active and visible, and relatively safe without parental protection. Both adults make numerous trips to the nest and are often soaring above, or perched near or on the nest tree. The location and construction of the nest may still limit visibility of the nest, young, and adults.

**DETERMINING A PROJECT'S POTENTIAL
FOR IMPACTING SWAINSON'S HAWKS**

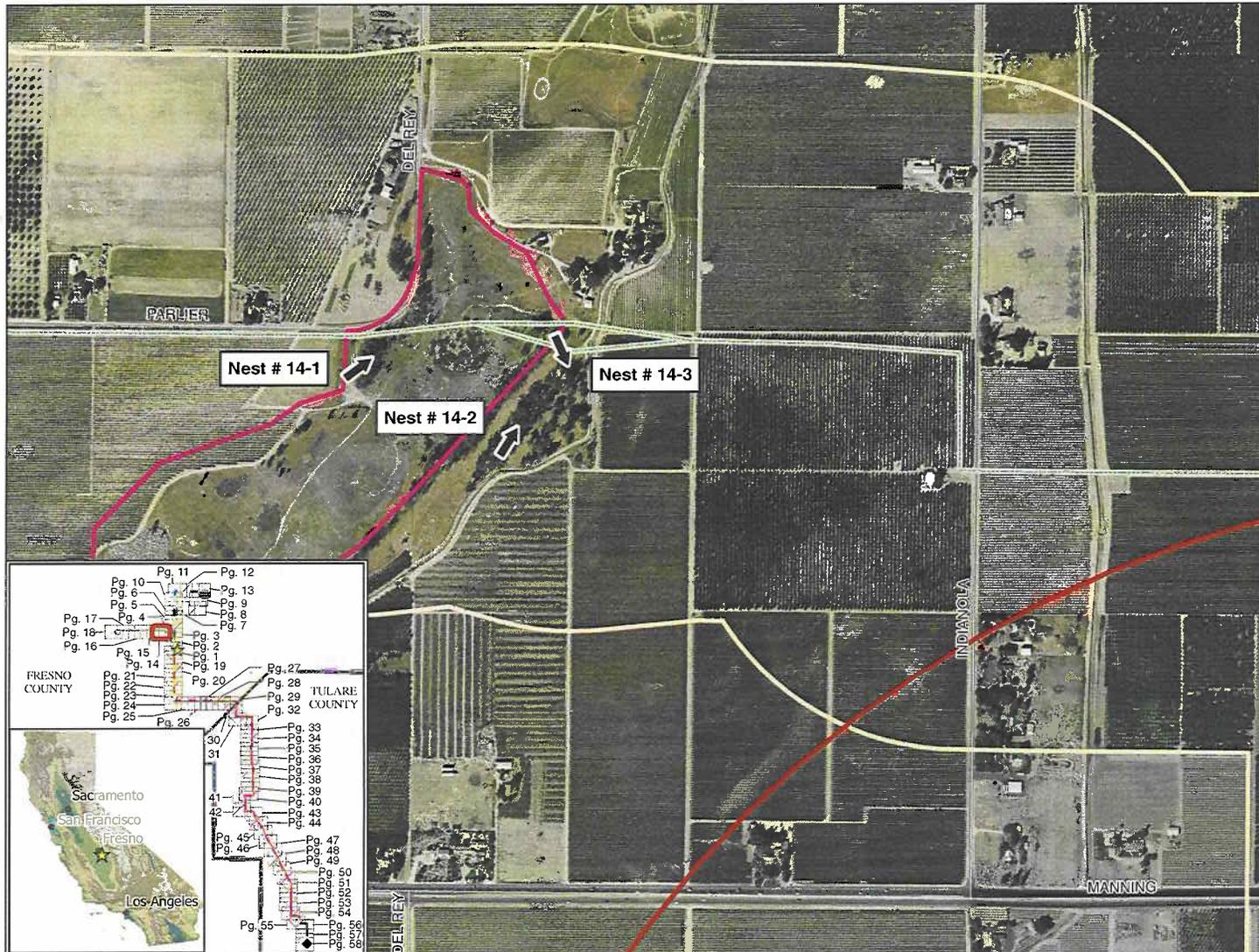
LEVEL OF RISK	REPRODUCTIVE SUCCESS (Individuals)	LONGTERM SURVIVABILITY (Population)	NORMAL SITE CHARACTERISTICS (Daily Average)	NEST MONITORING
<p align="center">HIGH</p> 	<p>Direct physical contact with the nest tree while the birds are on eggs or protecting young. (Helicopters in close proximity)</p> <p>Loss of nest tree after nest building is begun prior to laying eggs.</p> <p>Personnel within 50 yards of nest tree (out of vehicles) for extended periods while birds are on eggs or protecting young that are < 10 days old.</p> <p>Initiating construction activities (machinery and personnel) within 200 yards of the nest after eggs are laid and before young are > 10 days old.</p> <p>Heavy machinery only working within 50 yards of nest.</p> <p>Initiating construction activities within 200 yards of nest before nest building begins or after young > 10 days old.</p> <p>All project activities (personnel and machinery) greater than 200 yards from nest.</p>	<p>Loss of available foraging area.</p> <p>Loss of nest trees.</p> <p>Loss of potential nest trees.</p> <p>Cumulative: Multi-year, multi-site projects with substantial noise/personnel disturbance.</p> <p>Cumulative: Single-season projects with substantial noise/personnel disturbance that is greater than or significantly different from the daily norm.</p> <p>Cumulative: Single-season projects with activities that "blend" well with site's "normal" activities.</p>	<p>Little human-created noise, little human use: nest is well away from dwellings, equipment yards, human access areas, etc.</p> <p><i>Do not include general cultivation practices in evaluation.</i></p> <p>Substantial human-created noise and occurrence: nest is near roadways, well-used waterways, active airstrips, areas that have high human use.</p> <p><i>Do not include general cultivation practices in evaluation.</i></p>	<p align="center">MORE</p>  <p align="center">LESS</p>

APPENDIX L

Maps of Nest Locales



Kings River Conservation District Community Power Plant





KRCDD COMMUNITY POWER PLANT
Energy for our Future

Figure: 8.16-2

Biological Resources
Page: 14 of 58

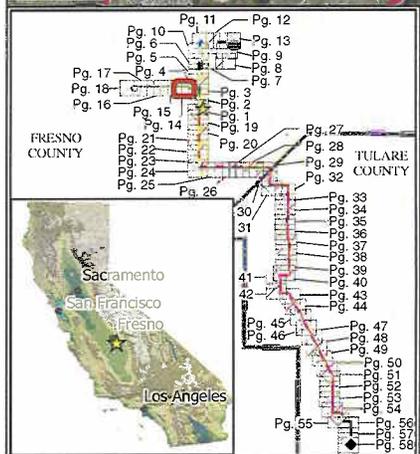
- ★ KRCDD Community Power Plant
- KRCDD CPP Project Site
- KRCDD CPP Project Laydown (New)
- KRCDD C.P.P Project Laydown (Originally Proposed)
- KRCDD C.P.P Site 1 Mile Buffer
- Linears 1/4 Mile Buffer
- Substation
- Proposed 230KV Transmission Line (New)
- Waste Water Percolation Ponds
- Proposed Water Supply Pipeline - Option 1
- Proposed Water Supply Pipeline - Option 2
- Manning Recharge Basin
- HDD Bore / Laydown Area
- HDD Bore Span
- ◆ Natural Gas Connection Point
- Proposed Natural Gas Laydown Area
- Proposed Natural Gas Pipeline
- SoCal Gas 7000 Line
- Freeway
- Street
- Railroad
- Bore Location: Parcels 2008
- Waterway
- County Boundary
- City Boundary
- California Tiger Salamander
- California Natural Diversity Database
- San Joaquin Kit Fox
- Western Mastiff Bat
- Vernal Pool Fairy Shrimp
- Northern Claypan Vernal Pool
- Heartscale
- Subtle Crache

NOTE: Potable Water and Sewer Connections are on the project site.

N

0 250 500 750 1,000 Feet

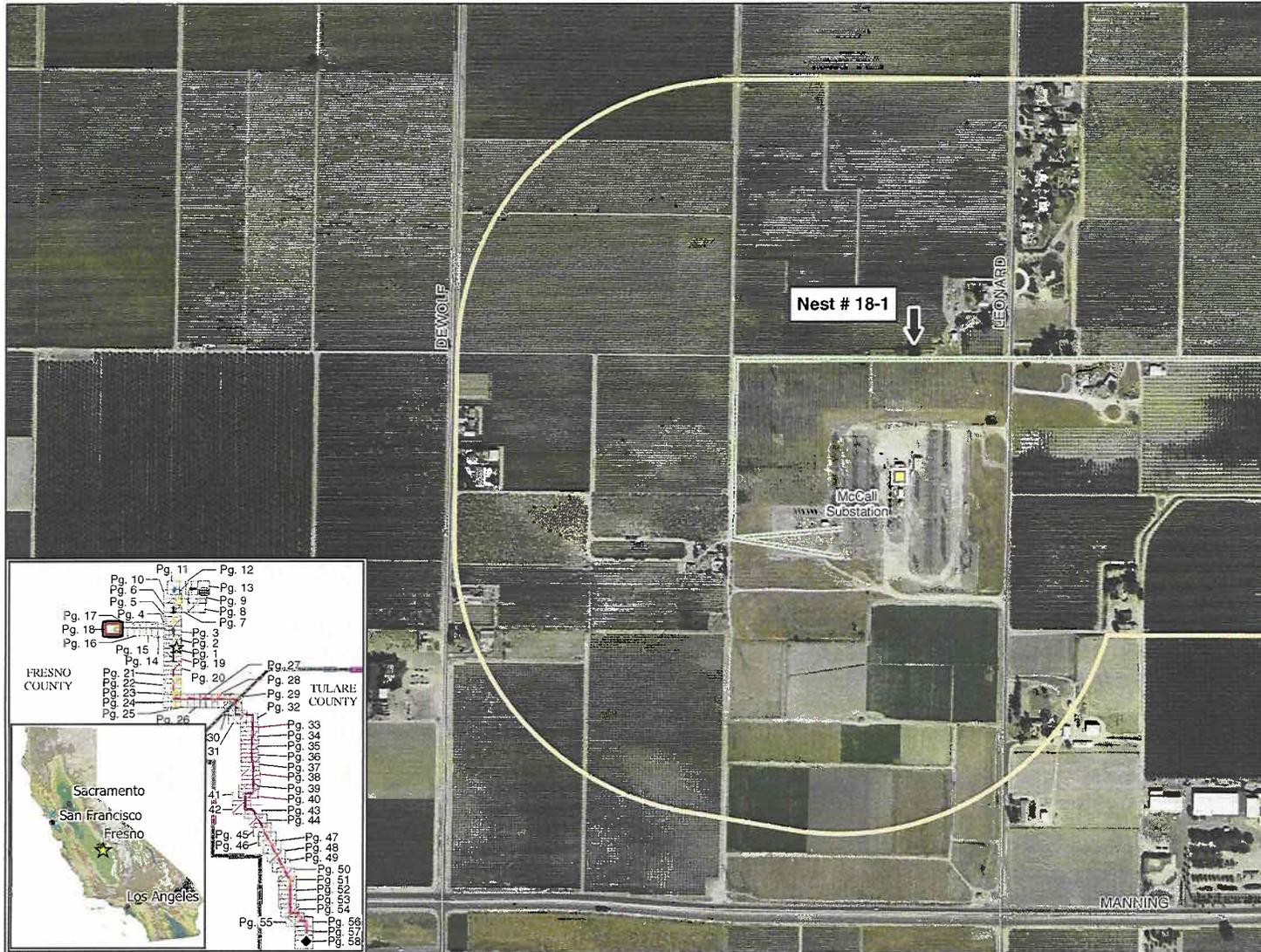
1:6,000 Scale 1 Inch equals 500 Feet



Z:\PROJECTS\Baseload_Location_Sites\MXD\KRCDDCPP Layout 11x17_Bo-SupplementB_Rev1_Bore_Locations.mxd

↑ - Nest Location (# refers to information table)

Kings River Conservation District Community Power Plant



KRCDD COMMUNITY POWER PLANT

Energy for our Future

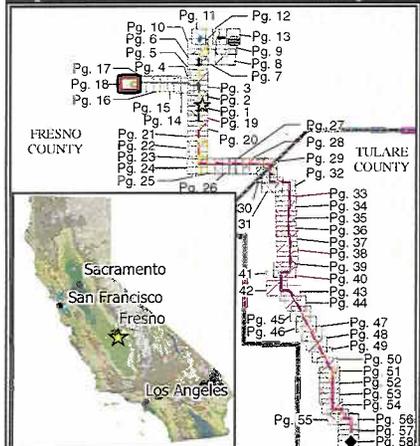
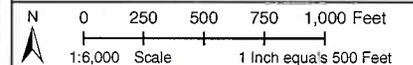
Figure: 8.16-2

Biological Resources

Page: 18 of 58

- ★ KRCDD Community Power Plant
- KRCDD CPP Project Site
- ▭ KRCDD CPP Project Laydown (New)
- ▭ KRCDD CPP Project Laydown (Originally Proposed)
- ▭ KRCDD CPP Site 1 Mile Buffer
- ▭ Linears 1/4 Mile Buffer
- Substation
- Proposed 230KV Transmission Line (New)
- Waste Water Percolation Ponds
- Proposed Water Supply Pipeline - Option 1
- Proposed Water Supply Pipeline - Option 2
- Manning Recharge Basin
- HDD Bore / Laydown Area
- HDD Bore Span
- ◆ Natural Gas Connection Point
- ▭ Proposed Natural Gas Laydown Area
- ▭ Proposed Natural Gas Pipeline
- ▭ SoCal Gas 7000 Line
- ▭ Freeway
- ▭ Street
- ▭ Railroad
- Bore Location Parcels 2008
- ▭ Waterway
- ▭ County Boundary
- ▭ City Boundary
- ▭ California Tiger Salamander
- ▭ California Natural Diversity Database
- ▭ San Joaquin Kit Fox
- ▭ Western Mastiff Bat
- ▭ Vernal Pool Fairy Shrimp
- ▭ Northern Claypan Vernal Pool
- ▭ Heartscale
- ▭ Subtle Orache

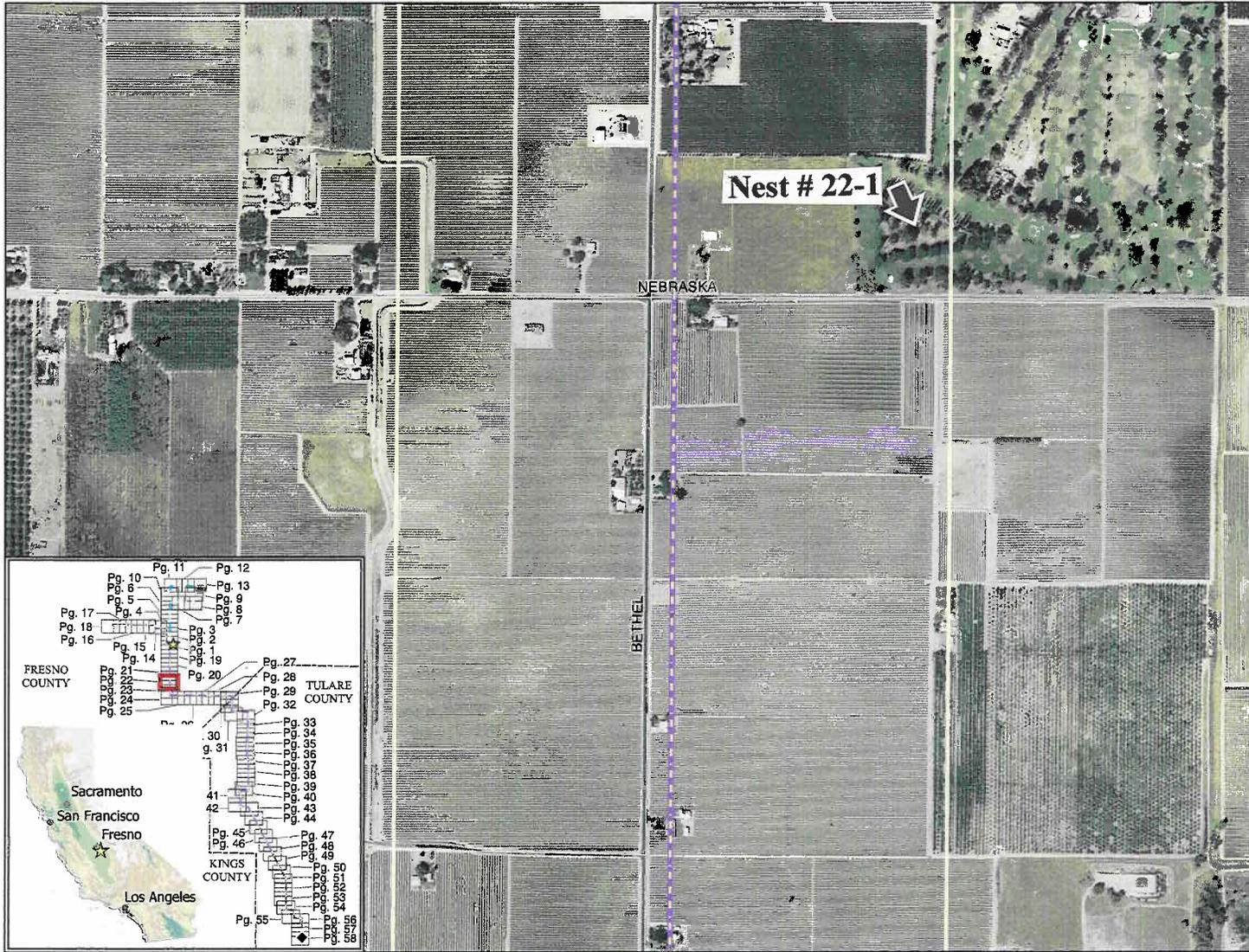
NOTE: Potable Water and Sewer Connections are on the project site.



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↑ - Nest Location (# refers to information table)

Kings River Conservation District Community Power Plant



KRCD COMMUNITY POWER PLANT

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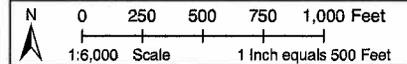
FIGURE: 8.16-2

Biological Resources

Page: 22 of 58

- ★ KRCD Community Power Plant
- ▭ KRCD CPP Project Site
- ▭ KRCD CPP Project Laydown
- ▭ KRCD CPP Site 1 Mile Buffer
- ▭ Linears 1/4 Mile Buffer
- ▭ Substation
- Proposed 230KV Transmission Line
- ▭ Waste Water Percolation Ponds
- ▭ Proposed Water Supply Pipeline - Option 1
- ▭ Proposed Water Supply Pipeline - Option 2
- ◆ Natural Gas Connection Point
- ▭ Proposed Natural Gas Laydown Area
- ▭ Proposed Natural Gas Pipeline
- ▭ SoCal Gas 7000 Line
- ▭ Waterway
- ▭ Freeway
- ▭ Street
- ▭ Railroad
- ▭ City Boundary
- ▭ County Boundary
- California Natural Diversity Database
- ▭ San Joaquin Kit Fox
- ▭ Western Mastiff Bat
- ▭ Vernal Pool Fairy Shrimp
- ▭ Northern Claypan Vernal Pool
- ▭ Heartscale
- ▭ Subtle Orache

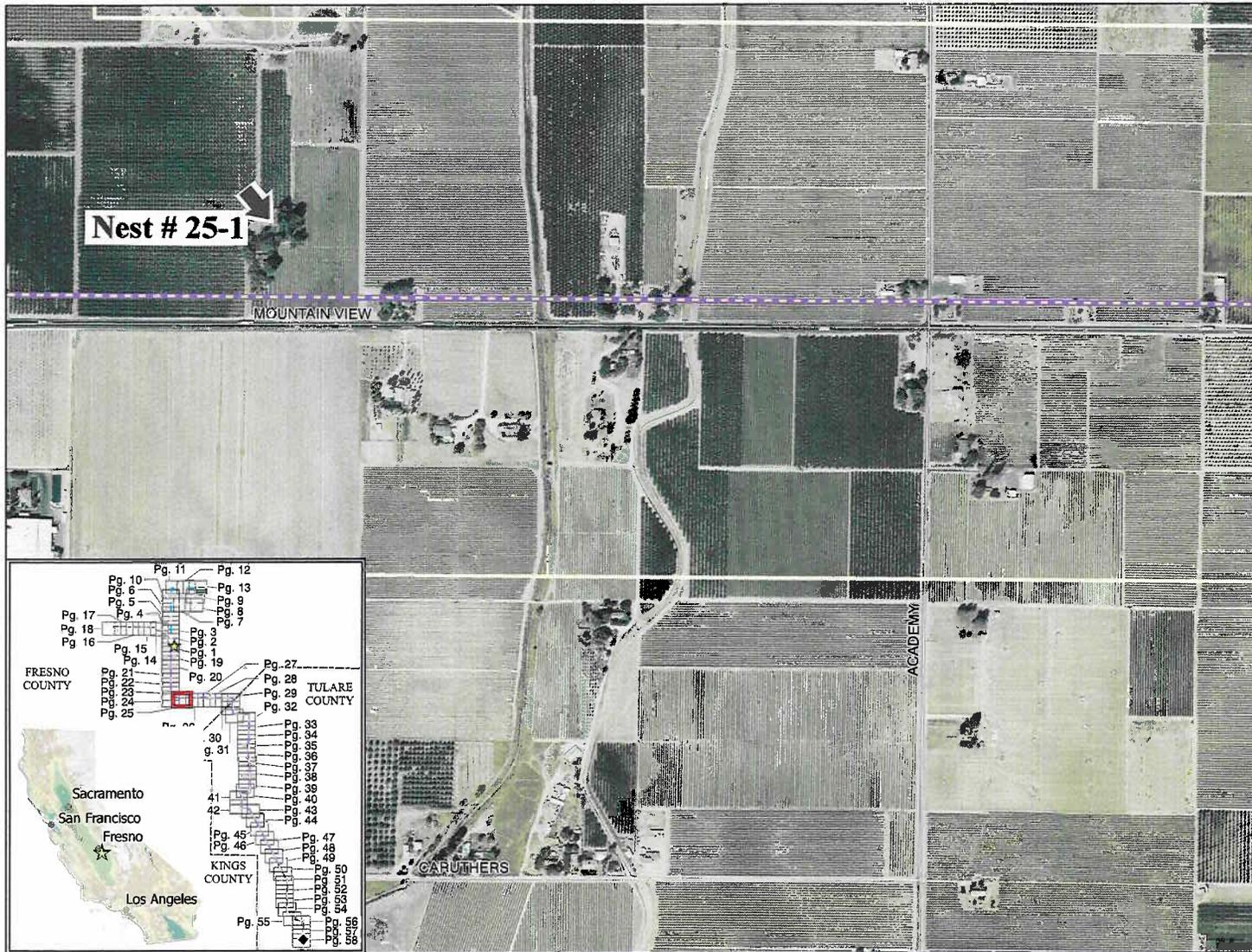
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2007-06-14- Rev:[10]

↑ - Nest Location (# refers to information table)

Kings River Conservation District Community Power Plant



KRCDD COMMUNITY POWER PLANT

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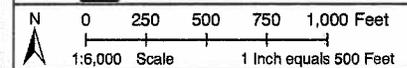
FIGURE: 8.16-2

Biological Resources

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- ★ KRCDD Community Power Plant
- ▭ KRCDD CPP Project Site
- ▭ KRCDD CPP Project Laydown
- ▭ KRCDD CPP Site 1 Mile Buffer
- ▭ Linears 1/4 Mile Buffer
- ▭ Substation
- Proposed 230KV Transmission Line
- ▭ Waste Water Percolation Ponds
- ▭ Proposed Water Supply Pipeline - Option 1
- ▭ Proposed Water Supply Pipeline - Option 2
- ◆ Natural Gas Connection Point
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- ▭ Proposed Natural Gas Pipeline
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- ▭ Waterway
- ▭ Freeway
- ▭ Street
- ▭ Railroad
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- ▭ County Boundary
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- ▭ Western Mastiff Bat
- ▭ Vernal Pool Fairy Shrimp
- ▭ Northern Claypan Vernal Pool
- ▭ Heartscale
- ▭ Subtle Orache

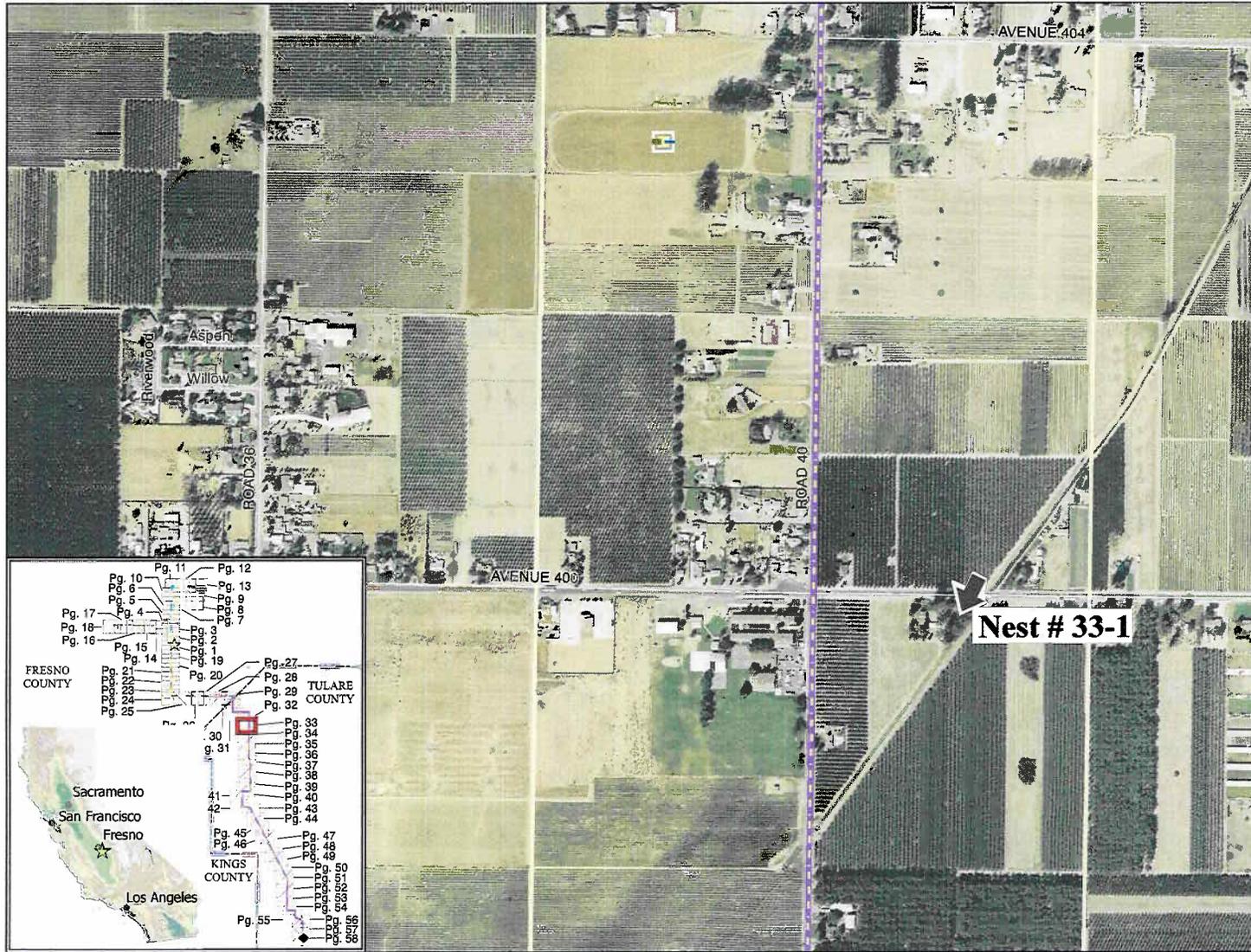
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2007-06-14- Rev:[10]

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Kings River Conservation District Community Power Plant



KRCD COMMUNITY POWER PLANT

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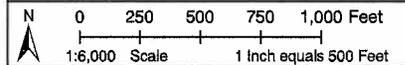
FIGURE: 8.16-2

Biological Resources

Page: 33 of 58

- ★ KRCD Community Power Plant
- ▭ KRCD CPP Project Site
- ▭ KRCD CPP Project Layout
- ▭ KRCD CPP Site 1 Mile Buffer
- ▭ Linears 1/4 Mile Buffer
- ▭ Substation
- Proposed 230KV Transmission Line
- ▭ Waste Water Percolation Ponds
- ▭ Proposed Water Supply Pipeline - Option 1
- ▭ Proposed Water Supply Pipeline - Option 2
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- ▭ SoCal Gas 7000 Line
- ▭ Waterway
- ▭ Freeway
- ▭ Street
- ▭ Railroad
- ▭ City Boundary
- ▭ County Boundary
- California Natural Diversity Database
- ▭ San Joaquin Kit Fox
- ▭ Western Mastiff Bat
- ▭ Vernal Pool Fairy Shrimp
- ▭ Northern Claypan Vernal Pool
- ▭ Heartscale
- ▭ Subtle Orache

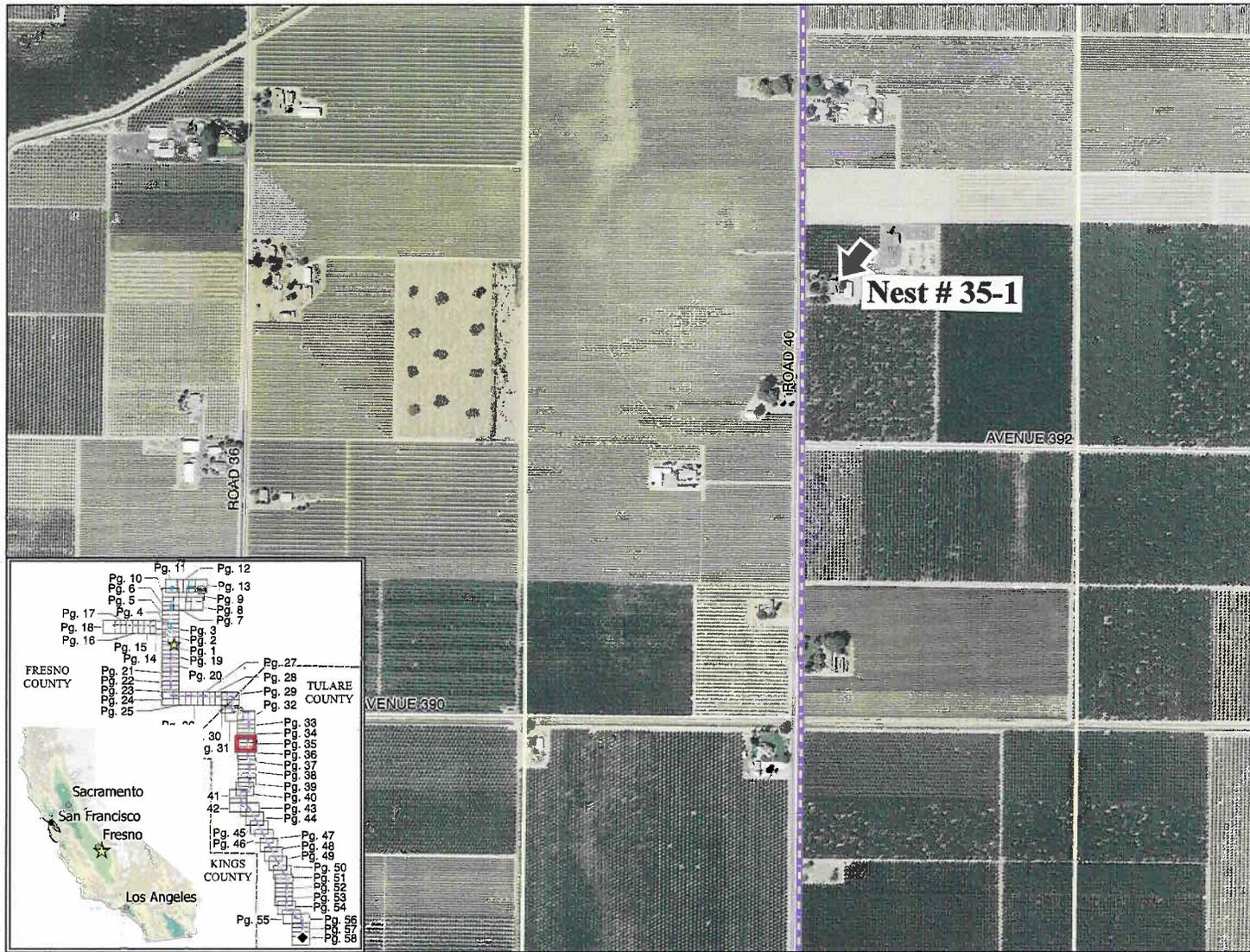
NOTE: Potable Water and Sewer Connections are on the project site.



2007-06-14- Rev:[10]

↑ - Nest Location (# refers to information table)

Kings River Conservation District Community Power Plant



KRCDD COMMUNITY POWER PLANT

Energy for our Future

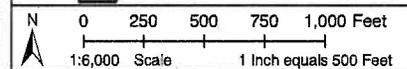
FIGURE: 8.16-2

Biological Resources

Page: 35 of 58

- ★ KRCDD Community Power Plant
- ▭ KRCDD CPP Project Site
- ▭ KRCDD CPP Project Laydown
- ▭ KRCDD CPP Site 1 Mile Buffer
- ▭ Linear 1/4 Mile Buffer
- ▭ Substation
- Proposed 230KV Transmission Line
- ▭ Waste Water Percolation Ponds
- ▭ Proposed Water Supply Pipeline - Option 1
- ▭ Proposed Water Supply Pipeline - Option 2
- ◆ Natural Gas Connection Point
- ▭ Proposed Natural Gas Laydown Area
- ▭ Proposed Natural Gas Pipeline
- ▭ SoCal Gas 7000 Line
- ▭ Waterway
- ▭ Freeway
- ▭ Street
- ▭ Railroad
- ▭ City Boundary
- ▭ County Boundary
- California Natural Diversity Database
 - ▭ San Joaquin Kit Fox
 - ▭ Western Mastiff Bat
 - ▭ Vernal Pool Fairy Shrimp
 - ▭ Northern Claypan Vernal Pool
 - ▭ Heartscale
 - ▭ Subtla Orache

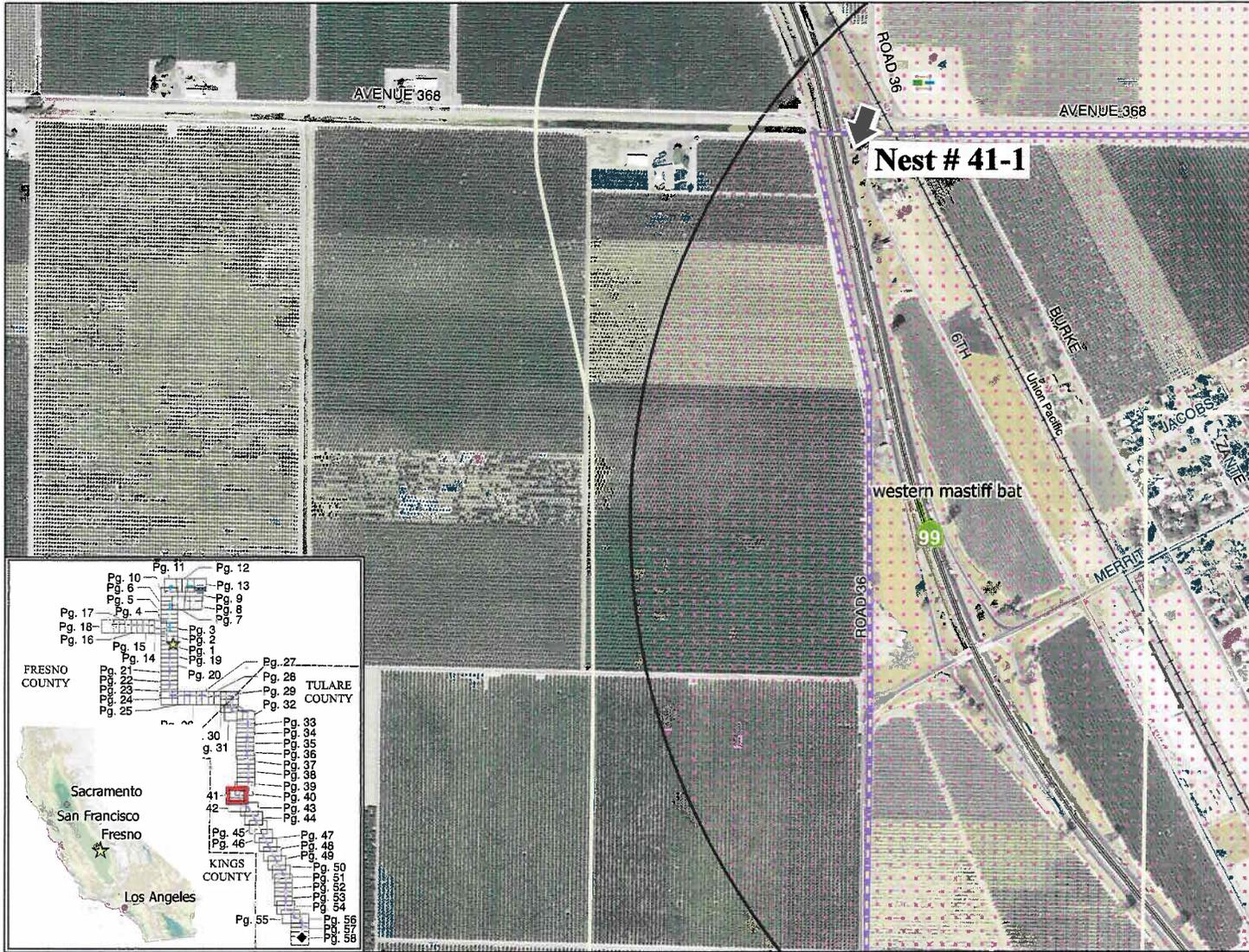
NOTE: Potable Water and Sewer Connections are on the project site



2007-06-14- Rev:[10]

↑ - Nest Location (# refers to information table)

Kings River Conservation District Community Power Plant



KRCD COMMUNITY POWER PLANT

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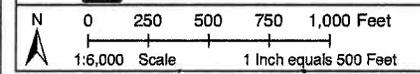
FIGURE: 8.16-2

Biological Resources

Page: 41 of 58

- ★ KRCD Community Power Plant
- ▭ KRCD CPP Project Site
- ▭ KRCD CPP Project Laydown
- ▭ KRCD CPP Site 1 Mile Buffer
- ▭ Linears 1/4 Mile Buffer
- ▭ Substation
- Proposed 230KV Transmission Line
- ▭ Waste Water Percolation Ponds
- ▭ Proposed Water Supply Pipeline - Option 1
- ▭ Proposed Water Supply Pipeline - Option 2
- ◆ Natural Gas Connection Point
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- ▭ Proposed Natural Gas Pipeline
- ▭ SoCal Gas 7000 Line
- ▭ Waterway
- ▭ Freeway
- ▭ Street
- ▭ Railroad
- ▭ City Boundary
- ▭ County Boundary
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- ▭ Western Mastiff Bat
- ▭ Vernal Pool Fairy Shrimp
- ▭ Northern Claypan Vernal Pool
- ▭ Heartscale
- ▭ Subtle Orache

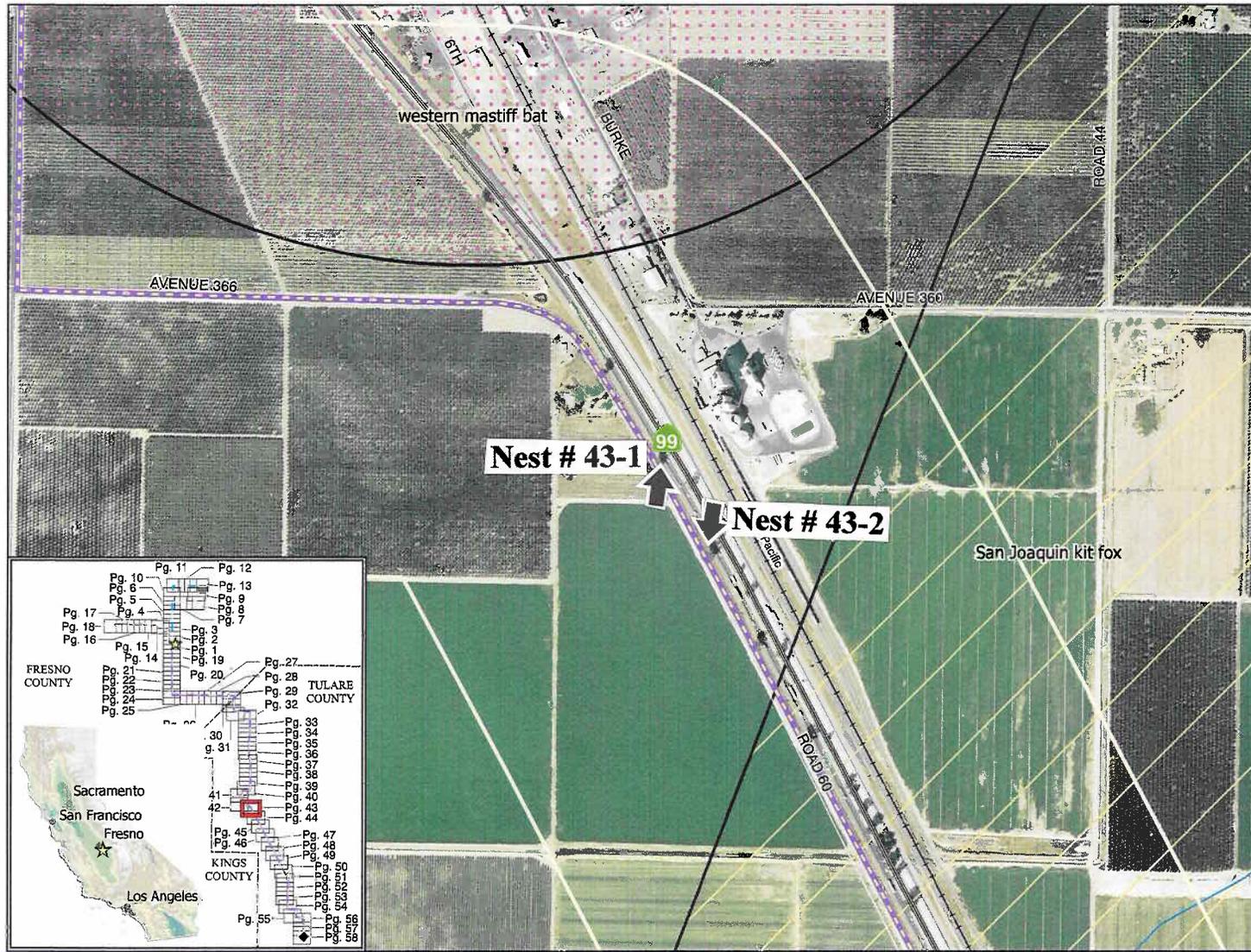
NOTE: Potable Water and Sewer Connections are on the project site.



2007-06-14- Rev:[10]

↑ - Nest Location (# refers to information table)

Kings River Conservation District Community Power Plant





**KRCDD COMMUNITY
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FIGURE: 8.16-2

Biological Resources
Page: 43 of 58

- ★ KRCDD Community Power Plant
- ▭ KRCDD CPP Project Site
- ▭ KRCDD CPP Project Laydown
- ▭ KRCDD CPP Site 1 Mile Buffer
- ▭ Linear 1/4 Mile Buffer
- ▭ Substation
- Proposed 230KV Transmission Line
- ▭ Waste Water Percolation Ponds
- ▭ Proposed Water Supply Pipeline - Option 1
- ▭ Proposed Water Supply Pipeline - Option 2
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- ▭ Proposed Natural Gas Pipeline
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- ~ Waterway
- ▭ Freeway
- ▭ Street
- ▭ Railroad
- ▭ City Boundary
- ▭ County Boundary

California Natural Diversity Database

- ▭ San Joaquin Kit Fox
- ▭ Western Mastiff Bat
- ▭ Vernal Pool Fairy Shrimp
- ▭ Northern Claypan Vernal Pool
- ▭ Heartscale
- ▭ Subtle Orache

NOTE: Potable Water and Sewer Connections are on the project site.



0 250 500 750 1,000 Feet

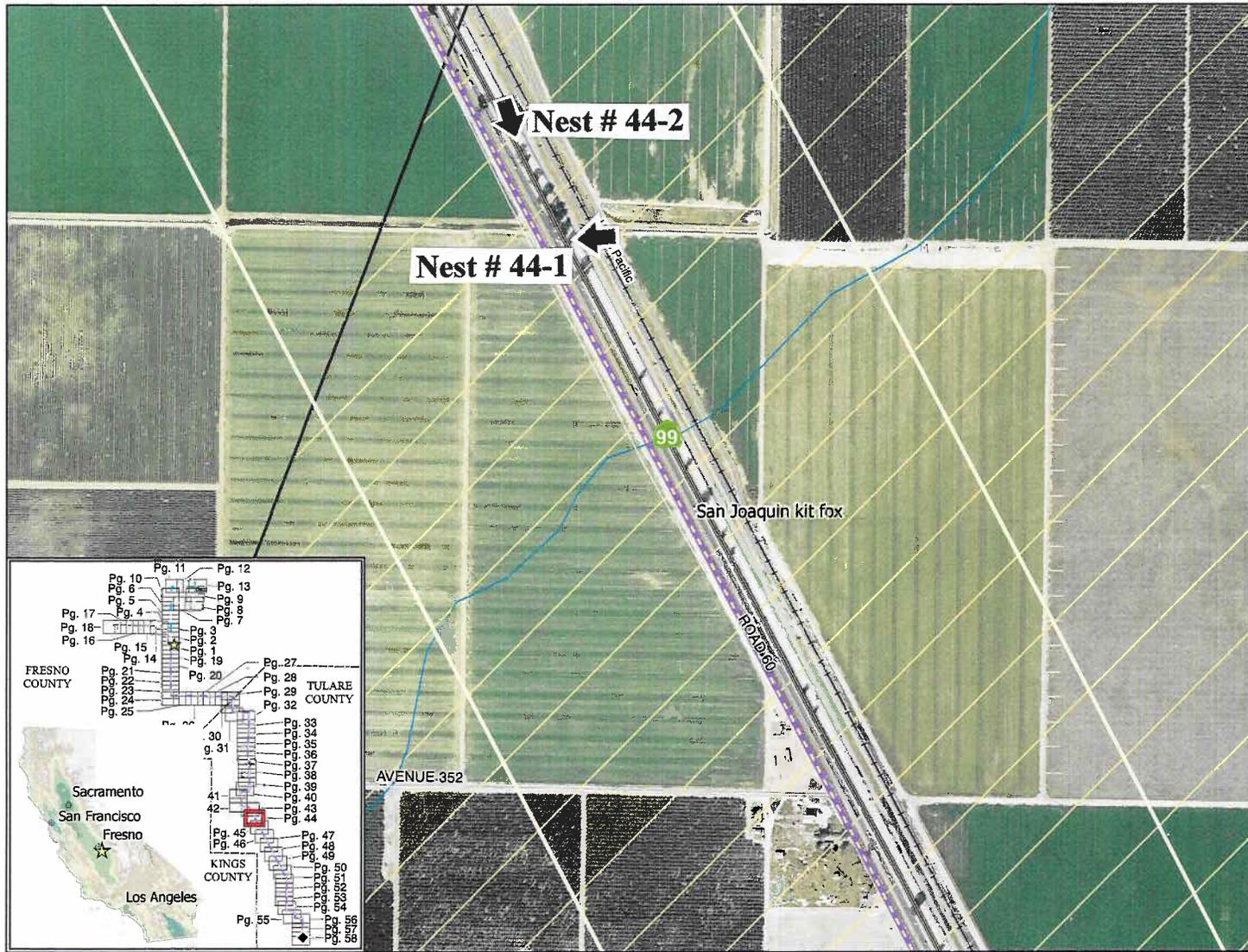
1:6,000 Scale

1 Inch equals 500 Feet

2007-06-14- Rev:[10]

↑ - Nest Location (# refers to information table)

Kings River Conservation District Community Power Plant



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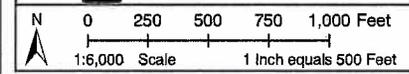
FIGURE: 8.16-2

Biological Resources

Page: 44 of 58

- ★ KRCD Community Power Plant
- ▭ KRCD CPP Project Site
- ▭ KRCD CPP Project Laydown
- ▭ KRCD CPP Site 1 Mile Buffer
- ▭ Linear's 1/4 Mile Buffer
- ▭ Substation
- Proposed 230KV Transmission Line
- ▭ Waste Water Percolation Ponds
- ▭ Proposed Water Supply Pipeline - Option 1
- ▭ Proposed Water Supply Pipeline - Option 2
- ◆ Natural Gas Connection Point
- ▭ Proposed Natural Gas Laydown Area
- ▭ Proposed Natural Gas Pipeline
- ▭ SoCal Gas 7000 Line
- ▭ Waterway
- ▭ Freeway
- ▭ Street
- ▭ Railroad
- ▭ City Boundary
- ▭ County Boundary
- California Natural Diversity Database
- ▭ San Joaquin Kit Fox
- ▭ Western Mastiff Bat
- ▭ Vernal Pool Fairy Shrimp
- ▭ Northern Claypan Vernal Pool
- ▭ Heartscale
- ▭ Subtle Orache

NOTE: Potable Water and Sewer Connections are on the project site.



2007-06-14- Rev:[10]

↑ - Nest Location (# refers to information table)

Kings River Conservation District Community Power Plant



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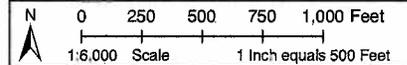
FIGURE: 8.16-2

Biological Resources

Page: 45 of 58

- ★ KRCD Community Power Plant
- ▭ KRCD CPP Project Site
- ▭ KRCD CPP Project Laydown
- ▭ KRCD CPP Site 1 Mile Buffer
- ▭ Linears 1/4 Mile Buffer
- ▭ Substation
- Proposed 230KV Transmission Line
- ▭ Waste Water Percolation Ponds
- ▭ Proposed Water Supply Pipeline - Option 1
- ▭ Proposed Water Supply Pipeline - Option 2
- ◆ Natural Gas Connection Point
- ▭ Proposed Natural Gas Laydown Area
- ▭ Proposed Natural Gas Pipeline
- ▭ SoCal Gas 7000 Line
- ▭ Waterway
- ▭ Freeway
- ▭ Street
- ▭ Railroad
- ▭ City Boundary
- ▭ County Boundary
- California Natural Diversity Database
- ▭ San Joaquin Kit Fox
- ▭ Western Mastiff Bat
- ▭ Vernal Pool Fairy Shrimp
- ▭ Northern Claypan Vernal Pool
- ▭ Heartscale
- ▭ Subtle Orache

NOTE: Potable Water and Sewer Connections are on the project site.



2007-06-14- Rev.[10]

↑ - Nest Location (# refers to information table)

Kings River Conservation District Community Power Plant

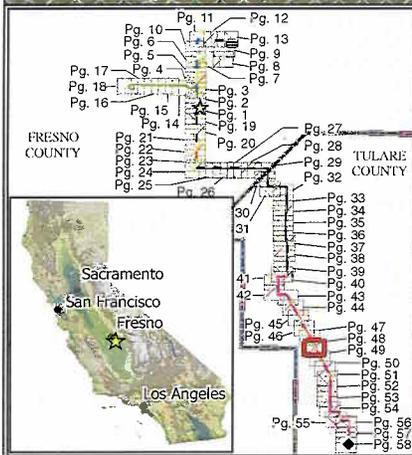
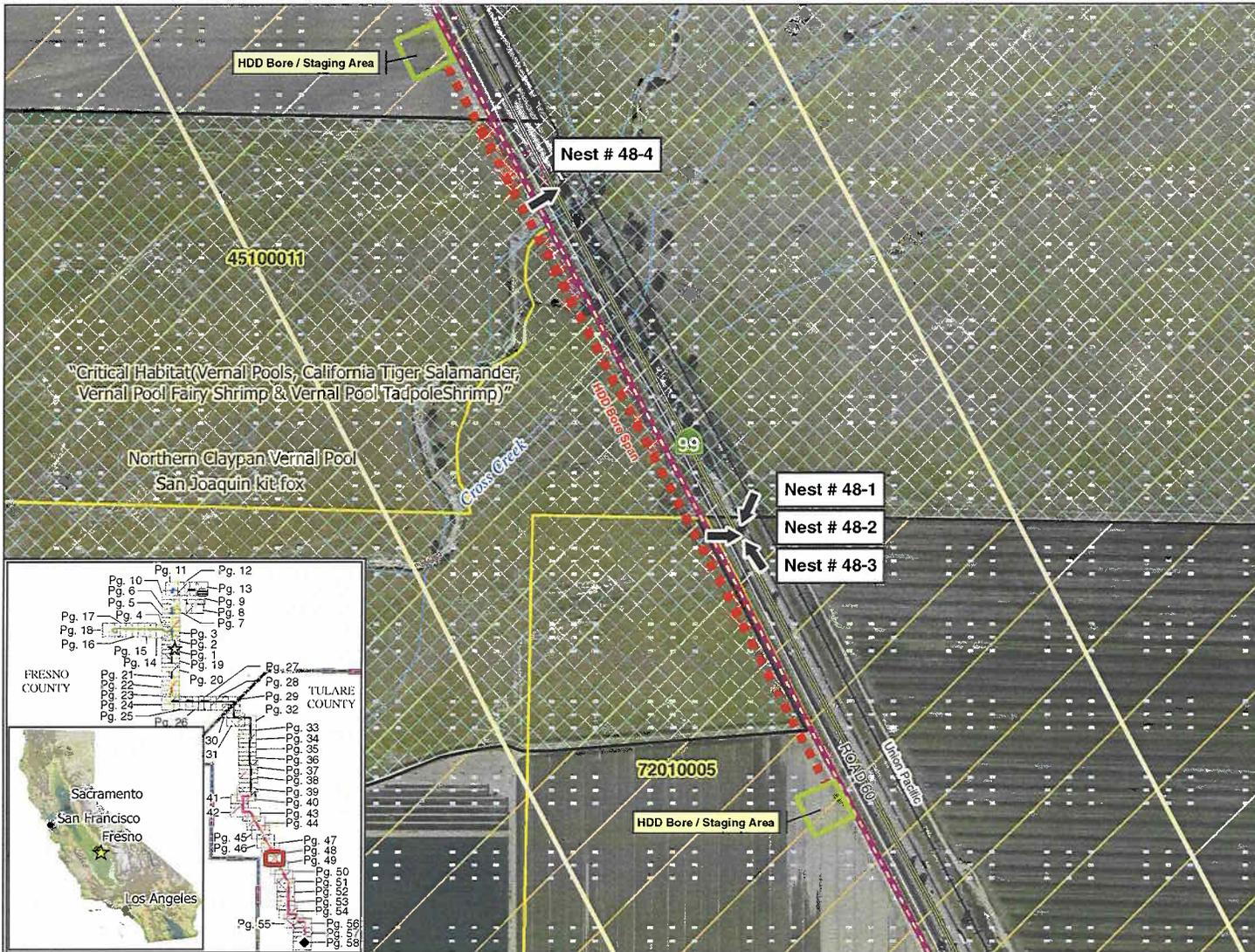


**KRCDD COMMUNITY
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Figure: 8.16-2

Biological Resources
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- ★ KRCDD Community Power Plant
- KRCDD CPP Project Site
- KRCDD CPP Project Laydown (New)
- KRCDD CPP Project Laydown (Originally Proposed)
- KRCDD CPP Site 1 Mile Buffer
- Linears 1/4 Mile Buffer
- Substation
- Proposed 230KV Transmission Line (New)
- Waste Water Percolation Ponds
- Proposed Water Supply Pipeline - Option 1
- Proposed Water Supply Pipeline - Option 2
- Manning Recharge Basin
- HDD Bore / Laydown Area
- HDD Bore Span
- ◆ Natural Gas Connection Point
- Proposed Natura Gas Laydown Area
- Proposed Natura Gas Pipeline
- SoCal Gas 7000 Line
- Freeway
- Street
- Railroad
- Bore Location Parcels 2008
- Waterway
- County Boundary
- City Boundary
- California Tiger Salamander
- California Natural Diversity Database
- San Joaquin Kit Fox
- Western Mastiff Bat
- Vernal Pool Fairy Shrimp
- Northern Claypan Vernal Pool
- Heartscale
- Subtle Cracks

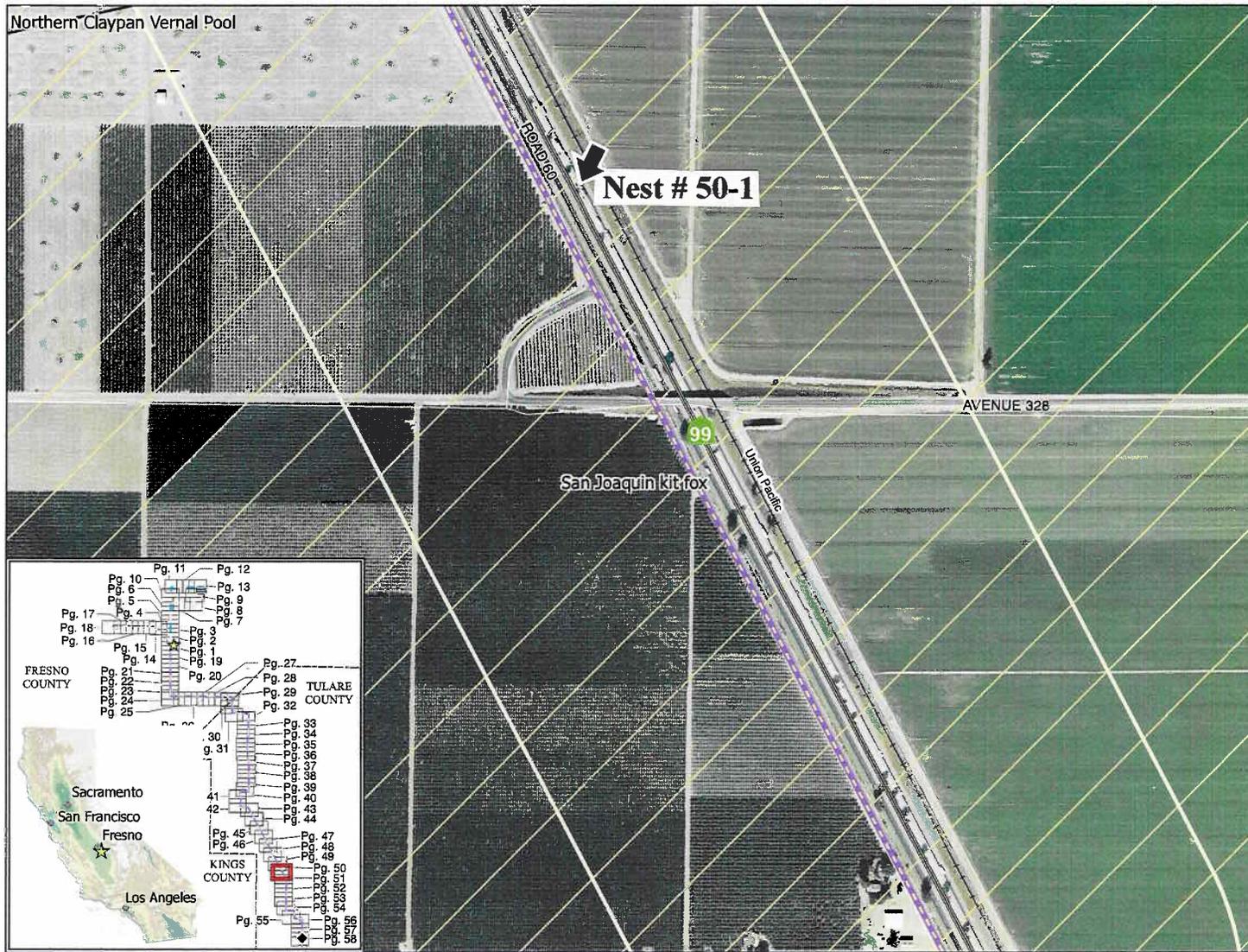
NOTE: Potable Water and Sewer Connections are on the project site.

N 0 250 500 750 1,000 Feet
1:6,000 Scale 1 Inch equals 500 Feet

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↑ - Nest Location (# refers to information table)

Kings River Conservation District Community Power Plant



**KRCD COMMUNITY
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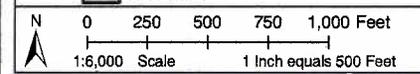
FIGURE: 8.16-2

Biological Resources

Page: 50 of 58

- ★ KRCD Community Power Plant
- KRCD CPP Project Site
- KRCD CPP Project Laydown
- KRCD CPP Site 1 Mile Buffer
- Linear's 1/4 Mile Buffer
- Substation
- Proposed 230KV-Transmission Line
- ☒ Waste Water Percolation Ponds
- Proposed Water Supply Pipeline - Option 1
- Proposed Water Supply Pipeline - Option 2
- ◆ Natural Gas Connection Point
- Proposed Natural Gas Laydown Area
- Proposed Natural Gas Pipeline
- SoCal Gas 7000 Line
- ~ Waterway
- == Freeway
- Street
- Railroad
- City Boundary
- County Boundary
- California Natural Diversity Database
- San Joaquin Kit Fox
- Western Mastiff Bat
- Vernal Pool Fairy Shrimp
- Northern Claypan Vernal Pool
- Heatscale
- Subtle Orache

NOTE: Potable Water and Sewer Connections are on the project site.



2007-06-14- Rev:[10]

↑ - Nest Location (# refers to information table)

Kings River Conservation District Community Power Plant



KRCD COMMUNITY POWER PLANT

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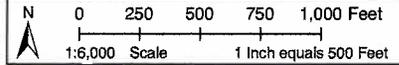
FIGURE: 8.16-2

Biological Resources

Page: 52 of 58

- ★ KRCD Community Power Plant
- ▭ KRCD CPP Project Site
- ▭ KRCD CPP Project Laydown
- ▭ KRCD CPP Site 1 Mile Buffer
- ▭ Liners 1/4 Mile Buffer
- ▭ Substation
- Proposed 230KV Transmission Line
- ▭ Waste Water Percolation Ponds
- ▭ Proposed Water Supply Pipeline - Option 1
- ▭ Proposed Water Supply Pipeline - Option 2
- ◆ Natural Gas Connection Point
- ▭ Proposed Natural Gas Laydown Area
- ▭ Proposed Natural Gas Pipeline
- ▭ SoCal Gas 7000 Line
- ▭ Waterway
- ▭ Freeway
- ▭ Street
- ▭ Railroad
- ▭ City Boundary
- ▭ County Boundary
- California Natural Diversity Database
 - ▭ San Joaquin Kit Fox
 - ▭ Western Mastiff Bat
 - ▭ Vernal Pool Fairy Shrimp
 - ▭ Northern Claypan Vernal Pool
 - ▭ Heartscale
 - ▭ Subtle Orache

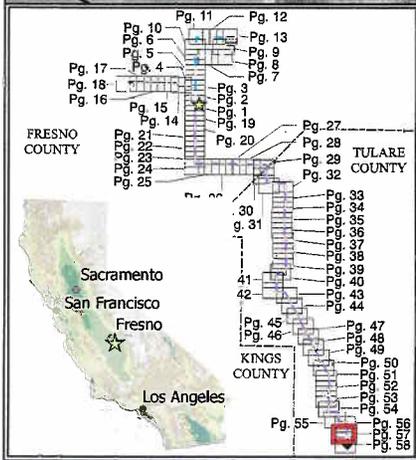
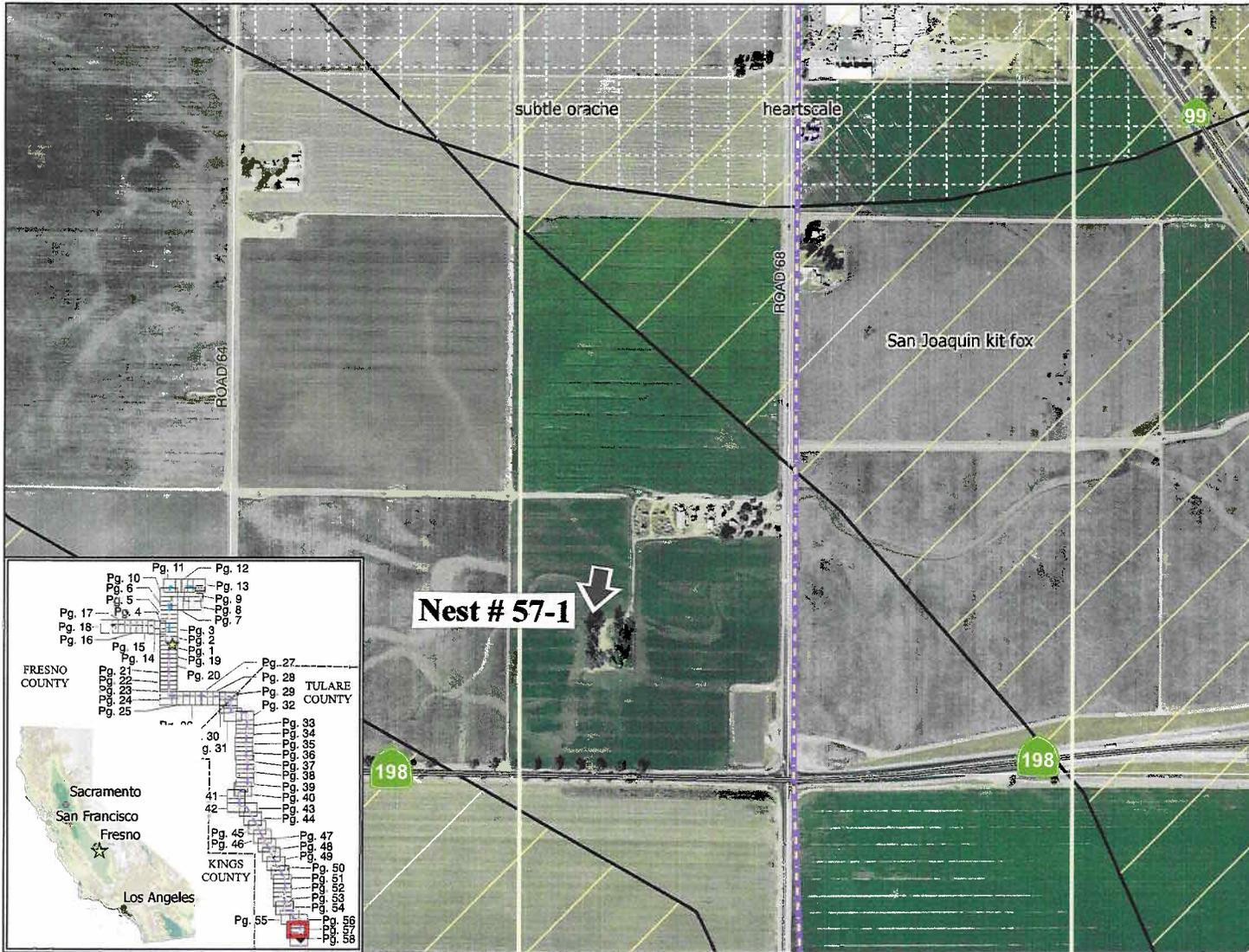
NOTE: Potable Water and Sewer Connections are on the project site.



2007-06-14- Rev:[10]

↑ - Nest Location (# refers to information table)

Kings River Conservation District Community Power Plant





KRCD COMMUNITY POWER PLANT
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FIGURE: 8.16-2

Biological Resources
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- ★ KRCD Community Power Plant
- ▭ KRCD CPP Project Site
- ▭ KRCD CPP Project Laydown
- ▭ KRCD CPP Site 1 Mile Buffer
- ▭ Linears 1/4 Mile Buffer
- ▭ Substation
- Proposed 230KV Transmission Line
- ▭ Waste Water Percolation Ponds
- ▭ Proposed Water Supply Pipeline - Option 1
- ▭ Proposed Water Supply Pipeline - Option 2
- ◆ Natural Gas Connection Point
- ▭ Proposed Natural Gas Laydown Area
- ▭ Proposed Natural Gas Pipeline
- ▭ SoCal Gas 7000 Line
- ▭ Waterway
- ▭ Freeway
- ▭ Street
- ▭ Railroad
- ▭ City Boundary
- ▭ County Boundary

California Natural Diversity Database

- ▭ San Joaquin Kit Fox
- ▭ Western Mastiff Bat
- ▭ Vernal Pool Fairy Shrimp
- ▭ Northern Claypan Vernal Pool
- ▭ Heartscale
- ▭ Subtle Orache

NOTE: Potable Water and Sewer Connections are on the project site.



0 250 500 750 1,000 Feet
1:6,000 Scale 1 Inch equals 500 Feet

2007-06-14- Rev.[10]

↑ - Nest Location (# refers to information table)

APPENDIX M

Table of Nest Data and Use Notes

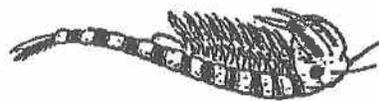


Table of Nest Data and Use Notes
Nesting Raptor Survey - Nest Monitoring (2008)
KRCD Community Power Plant

Nest #^a	Date Found	Dates Checked	Bird Species^b	Nest Size (ft)	Nest Height (ft)	Tree Type	Nest Use Date	Distance to Project (ft)	Project Feature^c
14-1	3/17/08	3/17, 3/28, 4/11, 4/18, 4/28, 5/2	Unknown No use	2 x 2	30	Eucalyptus	No use	0	TL
14-2	12/28/07	12/28, 3/17, 3/28, 4/11, 4/18, 4/28, 5/2	Unknown No use	2 x 2	100	Eucalyptus	No use	100	TL
14-3	12/28/07	12/28, 3/17, 3/28, 4/11, 4/18, 4/28, 5/2	Great horned owl	3 x 3	100	Eucalyptus	3/17, 4/11, 4/18, 4/28, 5/2	500	TL
18-1	3/17/08	3/17, 3/28, 4/11, 4/18, 4/28, 5/2	Unknown No use	1.5 x 1.5	70	Walnut	No use	0	TL
22-1	3/17/08	3/17, 3/28, 4/11, 4/18, 4/28, 5/2	Unknown No use	1.5 x 1.5	100	Poplar	No use	1,300	GP
25-1	3/28/08	3/28, 4/11, 4/18, 4/28, 5/2	Great horned owl	3 x 3	70	Eucalyptus	3/28, 4/11, 4/28, 5/2	200	GP
33-1	3/28/08	3/28, 4/11, 4/18, 4/28, 5/2	RTHA	2 x 2	80	Eucalyptus	3/28, 4/11	500	GP
35-1	3/17/08	3/17, 3/28, 4/11, 4/18, 4/28, 5/2	Unknown No use	1.5 x 1.5	40	Unknown	No use	150	GP
41-1	3/19/08	3/19, 3/28, 4/11, 4/18, 4/28, 5/2	Crow	1.5 x 1.5	80	Eucalyptus	3/19, 5/2	50	GP
43-1	3/19/08	3/19, 3/28, 4/11, 4/18, 4/28, 5/2	Crow	2 x 2	80	Eucalyptus	3/19, 4/11	30	GP
43-2	3/19/08	3/19, 3/28, 4/11, 4/18, 4/28, 5/2	Unknown No use	1.5 x 1.5	80	Eucalyptus	No use	100	GP
44-1	3/19/08	2/6, 3/19, 3/28, 4/11, 4/18, 4/28, 5/2	Unknown No use	3 x 3	75	Eucalyptus	No use	60	GP

Nest #^a	Date Found	Dates Checked	Bird Species^b	Nest Size (ft)	Nest Height (ft)	Tree Type	Nest Use Date	Distance to Project (ft)	Project Feature^c
44-2	3/19/08	3/19, 3/28, 4/11, 4/18, 4/28, 5/2	Unknown No use	1.5 x 1.5	80	Eucalyptus	No use	100	GP
45-1	3/19/08	3/19, 3/28, 4/11, 4/18, 4/28, 5/2	Unknown No use	1.5 x 1.5	30	Eucalyptus	No use	100	GP
48-1	2/6/08	2/6, 3/19, 3/28, 4/11, 4/18, 4/28, 5/2	Unknown No use	1.5 x 1.5	100	Eucalyptus	No use	100	GP
48-2	2/6/08	2/6, 3/19, 3/28, 4/11, 4/18, 4/28, 5/2	RTHA	1.5 x 1.5	100	Eucalyptus	4/11	100	GP
48-3	2/6/08	2/6, 3/19, 3/28, 4/11, 4/18, 4/28, 5/2	Unknown No use	1.5 x 1.5	100	Eucalyptus	No use	100	GP
48-4 ^d	2/6/08	2/6, 3/19, 3/28, 4/11, 4/18, 4/28, 5/2	Crow	1.5 x 1.5	60	Eucalyptus	3/28	100	GP
50-1	3/19/08	3/19, 3/28, 4/11, 4/18, 4/28, 5/2	Unknown No use	1 x 1	75	Eucalyptus	No use	100	GP
52-1	3/28/08	3/28, 4/11, 4/18, 4/28, 5/2	Unknown No use	3 x 3	80	Eucalyptus	No use	150	GP
57-1	3/19/08	3/19, 3/28, 4/11, 4/18, 4/28, 5/2	RTHA	2 x 2	80	Eucalyptus	4/11	750	GP

a - This number refers to the map plate and a sequential number.

b - RTHA = Red-tailed Hawk

c - TL = Transmission Line; GP = Gas Pipeline. No nests were observed along the two water pipeline routes.

d - On 4/11/08, a Swainson's Hawk (dark phase) was observed sitting in this nest.