Chapter 4. Environmental Setting

INTRODUCTION

This chapter provides an overview of the existing physical environmental conditions (i.e., the environmental baseline) at the time this analysis was prepared. The project proposed by Williams is to install fiber optic cable systems along ten specific project routes throughout northern, central, and southern California (**Figure 1-1**). To provide diversity in the network so that service will not be interrupted in case of a cable break, some project routes have been designed to have an additional diversity/redundancy route (i.e., another route with the same initiation or termination point).

Unlike most projects analyzed in a California Environmental Quality Act (CEQA) document that consists of a site that can be described within a discrete area, the proposed project is linear and its routes traverse much of the state, from Placer and Mendocino counties in the north to Imperial County in the south. An overall discussion of the environmental setting would encompass most of California. An initial study/mitigated negative declaration "is neither intended nor required to include the level of detail included in an EIR" (State CEQA Guidelines Sec. 15063), yet it must consider all phases of project planning, implementation, operation, and maintenance. To provide a useful description of the environment that may be affected by the component parts of this multi-route, linear project, a general environmental setting is provided for each specific route, including, where applicable, diversity/redundancy routes.

This chapter is organized by resource topic, corresponding to the **Appendix F**, Environmental Checklist Form, of the State CEQA Guidelines, as amended. A completed checklist for the proposed project is provided in **Appendix A**.

I. AESTHETICS

Aesthetics typically refers to the perceived visual character of an area, such as of a scenic view, open space, or architectural facade. Visual character can be affected by the components of a proposed project (e.g., buildings constructed at a height that obstructs views, hillsides cut and graded, open space changed to an urban setting). The aesthetics of California vary widely across the state and the project routes. The aesthetic or visual qualities of a large metropolitan areas, such as Los Angeles, Riverside, San Francisco, and Sacramento, are quite different from those of smaller urban areas, such as San Luis Obispo and Davis. Likewise, rural areas, whether natural, agricultural, or a combination, have their own aesthetic character.

The project routes traverse a variety of landscapes. Some, such as the San Francisco to Santa Clara, San Luis Obispo to Los Osos Loop, Los Angeles to Riverside, and Los Angeles to Anaheim project routes, are within a single type of landscape (e.g., urban or suburban/rural) for their entire lengths.

Regulations, Approvals, and Permits Applicable to Aesthetics

No state or federal aesthetics permits or regulations are applicable to the proposed project. Regenerator/optical amplification (OP-AMP) stations will not be constructed on state or federal lands. At the local level, some localities, most notably the County of San Luis Obispo, will require approval of a conditional

use permit before construction of regenerator/OP-AMP stations. Minimizing visual impacts will be one consideration in the granting of the permit application.

Proposed Project Route Settings

The visual setting of the project routes varies. Generally, the routes are within idle pipelines parallel to railroad rights-of-way, within other existing pipeline or utility line routes, or within city streets. In some rural areas, the regenerator/OP-AMP stations will be constructed in undeveloped areas.

Point Arena to Sacramento

The project route passes through visual settings of rural coastal forest lands; urbanized inland valleys; grazing, agricultural, and marsh lands; and highly urbanized areas. State Route (SR) 1 is a designated scenic highway within Mendocino County. The route to Sacramento will parallel SR 1 for approximately 6 miles from the AT&T Corp. (AT&T) Japan cable landing at Manchester to Point Arena. SR 16 is a designated scenic highway for the 6 miles from Brooks to Capay. SR 20 is designated as a scenic highway for 23 miles between Clear Lake to its intersection with SR 16; a portion of the route will parallel that stretch.

Sacramento to the California/Nevada Border

The project route passes through a visual setting that is mountainous and dominated by forested areas. Interstate 80 is designated as scenic from Emigrant Gap to the border. The route parallels Interstate 80 from the state line to east of the intersection with SR 89 (approximately 17 miles), then again from Soda Springs to Cisco (approximately 10 miles), and finally rejoins the highway at Emigrant Gap.

San Francisco to Santa Clara

The project route passes through visual settings that are highly urbanized with commercial, residential, and industrial uses typical of peninsula cities from San Francisco to Santa Clara. There are no designated scenic highways along this route.

Pittsburg to Sacramento

The project route passes through visual settings that are urban, rural, and agricultural. SR 160 is designated as scenic from Antioch to Sacramento. The route will adjoin SR 160 for approximately 5 miles as it crosses Sherman Island.

San Luis Obispo to Bakersfield

The visual setting consists of urban, oak woodlands, grazing land, oil fields, open range, and intensive agricultural land. The western segment near San Luis Obispo and Atascadero is located in the Santa Lucia Range, and the eastern segment is located on flatter terrain in Kern County. SR 101 is a designated scenic highway north of San Luis Obispo, the route will parallel the highway for approximately 5 miles between San Luis Obispo and Santa Margarita. The route crosses scenic-designated SR 46 west of Shandon and scenic SR 41 west of Shandon and west of Cholame, all in San Luis Obispo County (parallels SR 41 for approximately 1 mile).

San Luis Obispo to Los Osos Loop

The route passes through urban and industrial settings east of U.S. Highway 101 and agricultural and grazing land along Los Osos Valley Road. There are no designated scenic highways along these routes.

Riverside to California/Arizona border

The project route passes through various visual settings, including desert, agricultural, urban, and rural lands. The project route will basically parallel Interstate 10 between Beaumont and Indio. Along this segment, that section of Interstate 10 between Redlands and Whitewater has been designated or is eligible for designation as a state scenic highway. Also along the project route, between Beaumont and Whitewater, the route crosses SR 243 that has been designated the "Palms to Pines National Scenic Byway," which starts in Banning. The route also crosses that portion of SR 111 near Fingal, which has been designated or is eligible of designation as a state scenic highway. At this point, near Fingal, the route will cross the Pacific Crest National Scenic Trail. Additionally, the route will generally parallel the east side of SR 111 between Indio and Niland, a portion of which, between Mecca and Bombay Beach (Salton Sea State Recreation Area), is designated a state scenic highway. This section of SR 111 borders the Imperial Wildlife Area administered by the California Department of Fish and Game (DFG).

Los Angeles to Riverside

The project route passes through visual settings that are primarily industrial, commercial, and residential. There are no designated scenic highways along this route.

Los Angeles to Anaheim

The project route crosses primarily industrial, commercial, and residential visual settings. There are no designated scenic highways along this route.

II. AGRICULTURAL RESOURCES

California is the nation's leading agricultural state, with $26.8 billion worth of total production and income in 1997 (California Department of Food and Agriculture 1997). The variety of climates and soils in the state, together with the long growing season and availability of water, make it suitable for growing a wide variety of crops. The major crops produced in California include asparagus, cotton, citrus, grapes, lettuce, nuts, stone fruits (e.g., almonds and plums), strawberries, and tomatoes. Poultry, dairy, and beef cattle are also important products.

The major growing areas of California crossed by the project routes, and some of the major products of these areas, include:

- the Sierra Nevada foothills, which produce wine grapes, tree crops, and cattle;
- the northern coastal valleys (north of San Francisco), which support grapes and tree crops;
- the central coastal valleys (from San Mateo to San Luis Obispo counties), which produce grapes, strawberries, lettuce, and broccoli;

- the Central Valley, which produces dairy and cattle, poultry, rice, cotton, stone fruits (e.g., almonds and plums), grapes, citrus, row crops (e.g., lettuce, sugar beets), tomatoes, and alfalfa;

- the southern coastal valleys (from San Luis Obispo to San Diego counties), which produce cattle, avocados, kiwi fruit, citrus, row crops, and grapes; and

- the Coachella and Imperial valleys (Riverside and Imperial counties), which produce row crops, tomatoes, dates, cattle, and other agricultural products year round.

The loss of agricultural land is an increasingly important issue in California, particularly in the Central Valley, but also in the central and southern coastal valleys. The state's growing population is resulting in the conversion of agricultural lands to suburban and urban uses. According to the 1994–1996 Farmland Conversion Report of the California Department of Conservation's Farmland Monitoring and Mapping Project, approximately 15,400 acres (24 square miles) of Prime Farmland and Farmland of Statewide Importance were converted to nonagricultural uses between 1994 and 1996 (California Department of Conservation 1998). As land is converted to other uses and agriculture enters into increasing competition with urban and natural resource users for water (increasing the cost of water and reducing its reliability), the agricultural economy of some parts of the state is being adversely affected.

Regulations, Approvals, and Permits Applicable to Agricultural Resources

The California Farmland Protection Act (the Williamson Act) is the state's primary method for conserving farmland. This voluntary program is administered at the county level and offers property tax incentives to farmers who promise to keep their land in agricultural use. Under the act, owners of farm and grazing lands may enter into a contract with their county limiting the use of their land to agriculture for a period of at least 10 years. In response, the county will assess the land at its productive value rather than its fair market value. This reduces property tax increases that will otherwise arise from speculation over land values.

The Williamson Act's effectiveness in preserving farmland is limited by its voluntary nature. Those lands most likely to be developed are often not under contract or have had their contract canceled by the landowner in anticipation of development. The act is aimed at limiting the conversion of farmland to incompatible uses.

Development within agricultural areas also is subject to local zoning requirements. These vary from jurisdiction to jurisdiction. In most jurisdictions, utilities and associated small structures located in agricultural areas do not require a conditional use permit.

Proposed Project Route Settings

The following are general descriptions of the areas traversed by the project routes. Because most of the regenerator/OP-AMP sites are located outside of rights-of-way and all will result in permanent structures, the Farmlands Mapping and Monitoring Project (FMMP) classification has been included for those sites that have been mapped (because of insufficient soil information, substantial parts of the state have not been mapped by the FMMP). Except as otherwise noted, these are 1998 data from the California Department of Conservation's FMMP field maps.

Point Arena to Sacramento

The project route crosses agricultural lands in Mendocino and Lake counties that produce orchard crops, before dropping into the Central Valley where land is used for livestock grazing and production of numerous crops, such as grapes, row crops, and rice.

The Yorkville and Mountain House sites are not mapped by the FMMP. The Guinda site is identified as Prime Farmland (farmland with the best combination of physical and chemical features able to sustain long-term production of agricultural crops – the land must have been used for the production of irrigated crops at some time during the two update cycles before the mapping date to be classified as prime). The Clear Lake and Robbins sites are classified as Urban and Built-up Land (land in urban or residential uses).

Sacramento to the California/Nevada Border

The project route crosses a few agricultural areas that are used for fruit orchards and cattle grazing.

The Auburn site is classified as Urban and Built-up Land. The Blue Canyon site is classified as Other (land that does not fall into one of the FMMP categories). The East Truckee site is not mapped.

San Francisco to Santa Clara

There are no agriculture uses along this project route. There are no regenerator/OP-AMP sites along this project route.

Pittsburg to Sacramento

The project route is located in an area containing irrigated pasture; row crops, including sugar beets and corn; alfalfa; and grapes.

The Birds Landing site is classified as Grazing Land (land on which the existing vegetation is suited to grazing livestock). The Honker Bay site is classified as Urban and Built-up Land.

San Luis Obispo to Bakersfield

The project route is located in areas that supports cattle grazing, wine grapes, dry land farming, nuts, cotton, and row crops.

The Shandon site is classified as Urban and Built-up Land. The Middle Station site is classified as Other and the McGarvey site is classified as Grazing land. (1996 data.)

San Luis Obispo to Los Osos Loop

The project route crosses rural areas producing row crops and beans between San Luis Obispo and Los Osos.

There are no regenerator/OP-AMP stations proposed for this route.

Riverside to California/Arizona Border

This project route is located in California's productive southern tier of agriculture. Imperial County produces a range of products, including lettuce, alfalfa, cattle, winter row crops, and citrus. The Coachella Valley in Riverside County also produces a wide range of crops, including row crops, turf, and dates.

The Banning site is classified as Grazing. The Thousand Palms site is classified as Other land. The Flowing Wells site is Farmland of Local Importance (in Imperial County, this is unirrigated and uncultivated lands with prime and statewide soils). This site is approximately 23 acres in area, in contrast to the other sites that are approximately 1 acre. The Ogilby site is not mapped by the FMMP. The Mortmar site is classified as Other land.

Los Angeles to Riverside

The project route is located in an area where agriculture is limited; some vineyards exist near the Ontario Airport.

There is one regenerator/OP-AMP stations proposed for this route. The FMMP has not mapped this area.

Los Angeles to Anaheim

There are no agriculture uses along this project route. There are no regenerator/OP-AMP stations proposed for this route.

III. AIR QUALITY

California Climate and Meteorology

Because of the strong influence of the Pacific Ocean, the Coast Range, and the Sierra Nevada, climatic variations in California run in a general west-to-east direction. California's climate varies from Mediterranean (most of the state) to steppe (scattered foothill areas) to alpine (high Sierra) to desert (Colorado and Mojave deserts).

The Sierra Nevada and Cascade Range act as barriers to the passage of air masses. In summer, California is protected from much of the hot, dry air masses that develop over the central United States. Because of this barrier and its western border with the Pacific Ocean, portions of the state have a generally milder summer climate than the rest of the country. Despite the state's milder summer climate, California's summers are characterized by dry, sunny conditions with infrequent rainfall. These conditions often lead to stagnant conditions that can cause the formation of smog. Smog is composed of ground-level ozone and fine airborne particulates that affect human health, agricultural production, and forest health. Construction and operation of the proposed project will generate emissions of these smog-forming pollutants, which are evaluated in Chapter 5.

In winter, the same mountain ranges block cold, dry air masses located in the interior of the United States from moving into California. Consequently, winters in California are also milder than would be expected at these latitudes. During winter, inversions can cause the buildup of carbon monoxide and particulates, both of which will be generated during proposed project construction and operation.

Atmospheric and topographic conditions that create temperature inversions and permit stagnant air masses to remain for long periods allow the concentration of pollutants to increase. This aggravates pollutant concentration over urban, industrial, and agricultural areas. Air pollution in California is occasionally aggravated by its daily and seasonal wind patterns. Sea breezes move air pollution inland from coastal areas during the day, as cold dense air moves onshore. Land breezes push pollution back to coastal areas during the night.

Mountain valley breezes may also distribute air pollution. At night, the air drains downslope, but during the day winds reverse and blow upslope, carrying the polluted air from lower elevations. Mountain areas may have late afternoon or early evening smog for this reason. By morning, however, cold dense nighttime air has traveled downslope and settles within polluted valleys and mountain basin areas, which may cause ground-level inversions to form as the land radiates heat. Closed mountain basins or valleys are areas with high air pollution potential.

Regulations, Approvals, and Permits Applicable to Air Quality

Federal Regulatory Environment

The Federal Clean Air Act (FCAA) was passed in 1963 by the U.S. Congress and has been amended several times, most recently in 1990. The FCAA requires the U.S. Environmental Protection Agency (EPA) to establish national ambient air quality standards for air pollutants or air pollutant groups that pose a threat to human health or welfare. EPA has established national ambient air quality standards (NAAQS) for six criteria pollutants: ozone, sulfur dioxide, nitrogen dioxide, lead, particulate matter, and carbon monoxide (CO) (**Table 4.III-1**). Two separate standards have been set for particulate matter: one for particles 10 microns or less in diameter (PM10) and the other for particles 2.5 microns or less in diameter (PM2.5).

Air basins that are not in violation of an ambient air quality standard are considered to be in attainment for that standard. Conversely, air basins with recorded violations of an ambient air quality standard are classified as nonattainment areas for that pollutant. Most air basins are classified as nonattainment areas for one or more pollutants and attainment areas for other pollutants.

Air basins classified as nonattainment areas for the NAAQS must prepare state implementation plans that describe the specific steps that will be taken to bring the nonattainment area into compliance. Those steps primarily include rules and regulations to limit air emissions from specific stationary and mobile sources. The FCAA contains specific dates by which the NAAQS must be met, or federal sanctions can be imposed.

California Regulatory Environment

The California Clean Air Act (CCAA) of 1988 differs from the FCAA in that there are no sanctions or specific deadlines for attainment of the California Ambient Air Quality Standards (CAAQS), also shown in **Table 4.III-1**. Under the CCAA, air quality attainment is required at the earliest practicable date, and reasonable progress must be made each year. For certain pollutants, such as PM10, California has more stringent standards than the federal standard. Consequently, an air basin may be classified as a nonattainment area for the state PM10 standard, while it is in attainment for the federal PM10 standard.

Similar to the FCAA, the CCAA requires attainment plans for designated nonattainment areas, which are areas that currently violate the ambient air quality standards. The California Air Resources Board (ARB) is responsible for preparing the plans for meeting the NAAQS and CAAQS. The ARB has delegated to the

California air districts the responsibility for preparing air quality attainment plans. The CCAA, unlike the FCAA, does not require an air quality attainment plan for areas designated as nonattainment for the PM10 CAAQS.

Local Air Quality Regulatory Environment

The ARB has delegated much of its air pollution control authority to local air pollution control districts and air quality management districts. For example, the ARB does not have permit authority over the proposed project. That authority has been delegated to the local air districts. Each air district has jurisdiction over air quality in an air basin or portion of an air basin. California's 15 air basins are identified in **Figure 4.III-1**. Air basins and local air districts that are affected by the proposed project are listed in **Table 4.III-2**. For certain air basins covering more than one county, a unified air district has been formed to manage air quality issues throughout the basin. For example, the San Joaquin Valley Unified Air District manages air quality issues through the eight-county San Joaquin Valley Air Basin. In other multi-county air basins, individual county air districts manage air quality in only their county. As an example, the San Luis Obispo, Ventura, and Santa Barbara air districts manage air quality issues in their portion of the South Central Coast Air Basin.

Table 4.III-1. Ambient Air Quality Standards Applicable in California

			Standard, as parts per million		Standard, as micrograms per cubic meter		Violation Criteria	
Pollutant	Symbol	Average Time	California	National	California	National	California	National
Ozone	O_3	8 hours	N/A	0.08	N/A	160	N/A	If 3-year average of annual third-highest daily 8-hour maximum exceeds standard
		1 hour	0.09	0.12	180	235	If exceeded	If exceeded on more than 3 days in 3 years
Carbon monoxide	CO	8 hours	9.0	9	10,000	10,000	If exceeded	If exceeded on more than 1 day per year
		1 hour	20	35	23,000	40,000	If exceeded	If exceeded on more than 1 day per year
(Lake Tahoe only)		8 hours	6	N/A	7,000	N/A	If exceeded	N/A
Nitrogen dioxide	NO_2	Annual average	N/A	0.053	N/A	100	N/A	If exceeded
		1 hour	0.25	N/A	470	N/A	If exceeded	N/A
Sulfur dioxide	SO_2	Annual average	N/A	0.03	N/A	80	N/A	If exceeded
		24 hours	0.04	0.14	105	365	If exceeded	If exceeded on more than 1 day per year
		1 hour	0.25	N/A	655	N/A	N/A	N/A
Hydrogen sulfide	H_2S	1 hour	0.03	N/A	42	N/A	If equaled or exceeded	N/A
Vinyl chloride	C_2H_3Cl	24 hours	0.010	N/A	26	N/A	If equaled or exceeded	N/A
Inhalable particulate matter	PM10	Annual geometric mean	N/A	N/A	30	N/A	If exceeded	N/A
		Annual arithmetic mean	N/A	N/A	N/A	50	N/A	If exceeded
		24 hours	N/A	N/A	50	150	N/A	If exceeded on more than 1 day per year
Fine particulate matter	PM2.5	Annual arithmetic mean	N/A	N/A	N/A	15	N/A	If spatial average exceeded on more than 3 days in 3 years
		24 hours	N/A	N/A	N/A	65	N/A	If exceeds 98th percentile of concentrations in a year

Table 4.III-1. Ambient Air Quality Standards Applicable in California

Pollutant	Symbol	Average Time	Standard, as parts per million		Standard, as micrograms per cubic meter		Violation Criteria	
			California	National	California	National	California	National
Sulfate particles	SO_4	24 hours	N/A	N/A	25	N/A	If equaled or exceeded	N/A
Lead particles	Pb	Calendar quarter	N/A	N/A	N/A	1.5	N/A	If exceeded no more than 1 day per year
		30 days	N/A	N/A	1.5	N/A	If equaled or exceeded	N/A

Notes: All standards are based on measurements at 25°C and 1 atmosphere pressure.
National standards shown are the primary (health effects) standards.
N/A = not applicable.

Individual air districts or groups of air districts prepare air quality management plans designed to bring their jurisdiction into compliance with nonattainment area pollutants. Those plans are submitted to the ARB for approval. Those plans usually contain an emission inventory and a list of rules proposed for adoption.

The majority of air districts crossed by project routes also review the air quality sections of CEQA documents to ensure that adequate air quality mitigation is proposed.

Potential emissions generated by the proposed project will be from construction and from use of emergency generators at regenerator/OP-AMP stations. All regenerator/OP-AMP stations will be electrically powered with power purchased from local utilities and also have emergency generators powered by diesel combustion engines for use during power outages. All of the air districts affected by this proposed project have existing rules and regulations governing the operation of internal combustion engines. Those regulations either exempt engines designated as emergency standby engines or require that they be permitted as individual stationary sources. Generally, the regulations covering emergency standby engines limit the number of hours per year that they can operate and specify the maximum emission rates allowed.

Table 4.III-2. California Air Basins and Local Air Districts Crossed by Project Routes

Air Basin	Local Air Districts	Project Route
Lake County	Lake County	Point Arena to Sacramento
North Coast	Mendocino County, Northern Sonoma County	Point Arena to Sacramento
Sacramento Valley	Colusa County, Feather River, Sacramento Metropolitan, Yolo-Solano	Point Arena to Sacramento, Sacramento to California/Nevada border, and Pittsburg to Sacramento
Mountain Counties	Northern Sierra, Placer County	Sacramento to California/Nevada border
San Francisco Bay Area	Bay Area	Pittsburg to Sacramento and San Francisco to Santa Clara
San Joaquin Valley	San Joaquin Valley Unified	San Luis Obispo to Bakersfield
South Central Coast	San Luis Obispo County	San Luis Obispo to Bakersfield and San Luis Obispo to Los Osos Loop
Mojave Desert	Mojave Desert	Riverside to California/Arizona border
Salton Sea	Imperial County	Riverside to California/Arizona border

Table 4.III-2. California Air Basins and Local Air Districts Crossed by Project Routes

Air Basin	Local Air Districts	Project Route
South Coast	South Coast	Riverside to California/Arizona border, Riverside to Los Angeles, and Los Angeles to Anaheim

The attainment/nonattainment status for the 15 California air basins with regard to the pollutants of most concern related to construction and operation of the proposed project is described below.

Pollutants of Concern and Attainment/Nonattainment Status

Table 4.III-3 shows the attainment/nonattainment status for 10 California air basins with regard to the pollutants of most concern that could be generated during construction and operation of the fiber optic system. Those pollutants include ozone, PM10, CO, and nitrogen dioxide. These pollutants, each of which is described below, are emitted as construction equipment exhaust. Fugitive PM10 dust will also be emitted when construction vehicles, operating on exposed earth, re-entrain dust into the ambient air. Also, the diesel engines that power the emergency backup generators will release PM10, CO, and the ozone precursors, reactive organic gases (ROG), and oxides of nitrogen (NO_x).

Table 4.III-3. Air Quality Requirement Attainment Status by Pollutant and Air Basin

Air Basin	State Ozone	Federal Ozone	State PM10	Federal PM10	State CO	Federal CO	State NO_2	Federal NO_2
Lake County	A	A	A	A	A	A	A	A
North Coast	A	A	N	A	A	A	A	A
Sacramento Valley	N	N	N	N	A	A	A	A
Mountain Counties	N	N	N	A	A	A	A	A
San Francisco Bay Area	N	N	N	A	A	A	A	A
San Joaquin Valley	N	N	N	N	A	A	A	A
South Central Coast	N	N	N	A	A	A	A	A
Mojave Desert	N	N	N	N	A	A	A	A
Salton Sea	N	N	N	N	N	A	A	A
South Coast	N	N	N	N	N	N	A	A

Notes: Air basins classified as nonattainment areas have at least one area within that basin that has shown a violation of the relevant ambient standard. Air basins classified as transitional are nonattainment areas that show improving air quality.

A = attainment.

N = nonattainment.

Source: California Air Resources Board 1998.

Ozone

Ozone is a respiratory irritant and an oxidant that, when occurring at unhealthy levels, increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials. Ozone is a severe eye, nose, and throat irritant. Ozone also attacks synthetic rubber, textiles, plants, and other materials. Ozone causes extensive damage to plants by leaf discoloration and cell damage.

Ozone is not emitted directly into the air, but is formed by a photochemical reaction in the atmosphere. Ozone precursors, which include ROG and NO_x, react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem. The ozone precursors, ROG and NO_x, are emitted by mobile sources and by stationary combustion equipment.

State and federal standards for ozone have been set for a 1-hour averaging time. The state 1-hour ozone standard is 0.09 parts per million (ppm), not to be exceeded. The federal 1-hour ozone standard is 0.12 ppm, not to be exceeded more than three times in any 3-year period. The EPA recently replaced the 1-hour ozone standard with an 8-hour standard of 0.08 ppm. However, areas classified as nonattainment for ozone must attain the 1-hour ozone standard. After an area has achieved attainment of the 1-hour standard, then the 1-hour standard is no longer applicable and the area must strive to meet the 8-hour ozone standard. Several of the air basins through which fiber optic lines will be installed are classified as nonattainment for both the state and federal ozone standards.

PM10 and PM2.5

Health concerns associated with suspended particulate matter focus on those particles small enough to reach the lungs when inhaled (PM10 or smaller). Particulates can damage human health and retard plant growth. Particulates also reduce visibility, stain buildings, and corrode materials.

PM10 emissions are generated by a wide variety of sources, including agricultural activities, industrial emissions, dust suspended by vehicle traffic, and secondary aerosols formed by reactions in the atmosphere.

The federal ambient air quality standard for particulate matter currently applies to PM10 and PM2.5. The California ambient air quality standard only applies to PM10.

The state PM10 standards are 50 micrograms per cubic meter as a 24-hour average and 30 micrograms per cubic meter as an annual geometric mean. The federal PM10 standards are 150 micrograms per cubic meter as a 24-hour average and 50 micrograms per cubic meter as an annual arithmetic mean. The federal PM2.5 standards equal 15 micrograms per cubic meter for the annual average and 65 micrograms per cubic meter for the 24-hour average.

All portions of the South Coast, Sacramento Valley, San Joaquin Valley, Salton Sea, and Mojave Desert air basins are nonattainment for the federal PM10 standards, while all air basins except Lake County are nonattainment for the more stringent state standards (see **Table 4.III-3**).

Carbon Monoxide

CO is essentially inert to plants and materials but can have significant effects on human health. CO is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. Effects on humans range from slight headaches to nausea to death.

Motor vehicles are the dominant source of CO emissions in most areas. High CO levels develop primarily during winter when periods of light winds combine with the formation of ground-level temperature inversions. These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures. Monitored CO concentrations have been improving due to the use of oxygenated fuels in California. Violations of the CO concentrations are generally only a problem in heavily urbanized areas.

State and federal CO standards have been set for both 1-hour and 8-hour averaging times. The state 1-hour standard is 20 ppm by volume, and the federal 1-hour standard is 35 ppm. Both state and federal standards are 9 ppm for the 8-hour averaging period.

Of the air basins crossed by the project routes, only the South Coast Air Basin is currently in nonattainment status for the federal CO standards. Both the South Coast Air Basin and the Salton Sea Air Basin are in nonattainment status for the state CO standards.

Nitrogen Oxides

NO_x contributes to smog, injures plants and animals, and can affect human health. Also, NO_x contributes to acidic deposition and reacts with ROG in the presence of sunlight to form photochemical smog (ozone).

NO_x is primarily emitted by combustion sources, including both mobile and stationary sources. NO_x is also emitted by a variety of area sources ranging from wild and prescribed fires to water and space heating systems powered by fossil fuels.

The state NO_x standard equals 0.25 ppm on a 1-hour average. The federal NO_x standard equals 0.053 ppm on an annual average. All areas of California that will be crossed by the project routes are attainment areas for the state and federal NO_x standards.

Proposed Project Route Settings

The air districts crossed by the project routes are described below and in **Table 4.III-2**.

Point Arena to Sacramento

The project route passes through the North Coast, Lake County, and Sacramento Valley air basins (Mendocino County APCD, Lake County APCD, Colusa County APCD, Feather River APCD, Yolo-Solano APCD, and Sacramento Metropolitan Air Quality Management District [AQMD]).

Sacramento to the California/Nevada Border

This project route passes through the Mountain Counties and Sacramento Valley air basins (Northern Sierra APCD, Placer APCD, and Sacramento Metropolitan AQMD).

San Francisco to Santa Clara

This project route is completely within the San Francisco Bay Air Basin (Bay Area AQMD).

Pittsburg to Sacramento

This project route passes through the San Francisco Bay and Sacramento Valley air basins (Bay Area AQMD, Yolo-Solano APCD, and Sacramento Metropolitan AQMD).

San Luis Obispo to Bakersfield

This project route passes through the South Central Coast and San Joaquin Valley air basins (San Luis Obispo APCD and San Joaquin Valley Unified APCD).

San Luis Obispo to Los Osos Loop

This project route passes through within the South Central Coast Air Basin (San Luis Obispo APCD).

Riverside to California/Arizona Border

This project route passes through the Salton Sea, Mojave Desert, and South Coast air basins (Imperial APCD, Mojave Desert APCD, and South Coast AQMD).

Los Angeles to Riverside

This project route is completely within the South Coast Air Basin (South Coast AQMD).

Los Angeles to Anaheim

This project route is completely within the South Coast Air Basin (South Coast AQMD).

IV. BIOLOGICAL RESOURCES

Vegetation, wildlife, and fisheries resources are discussed separately below, including the methods used for identification and general information on those resources known or with potential to exist in the proposed project study areas (defined below). A description of noxious weeds and waters of the United States is included in the vegetation resources discussion. Information on applicable laws, regulations, permits, and policies pertaining to biological resources are discussed below and in **Appendix B**. Lists of individual resources located along each project route to date are provided in **Appendix G** and contain the most current information as of July 21, 1999. **Appendix K** provides the common and scientific names of the plant, wildlife, and fish species mentioned in the text.

Vegetation Resources

For the purposes of this discussion, vegetation resources include the following:

- common and sensitive plant communities,
- noxious weeds,
- waters of the United States (including wetland communities), and
- special-status plant species.

Methods

For the purpose of this initial study/mitigated negative declaration (IS/MND), the proposed project study area varied along each route, depending on terrain constraints, private property boundaries, fence lines, and dense vegetation that will not be removed during construction. The proposed project study area consisted of a 100-foot-wide corridor in open areas that were not confined by these factors. The study area in general ranged from 3 to 100 feet in width, depending on the factors listed above.

Existing available information was reviewed to determine the location and types of vegetation resources that could exist in the proposed project study area. This information included DFG's Natural Diversity Data Base (NDDB) (1999), California Native Plant Society's (CNPS's) Inventory of Rare and Endangered Vascular Plants of California (Skinner and Pavlik 1994), previously prepared environmental documents, Jones & Stokes Associates' file information, and relevant information from local planning documents. When appropriate, state and federal resource specialists were contacted to obtain information on special-status plants, noxious weeds, wetlands, and local ordinances (e.g., native tree ordinances or policies).

Reconnaissance-level field surveys were conducted in early 1999 for each project route. Botanical surveys are currently being conducted and will continue through late July and early August 1999 to identify late-blooming plant species. The general purpose of the field surveys is to:

- characterize plant communities and unique plant assemblages,
- identify special-status plant occurrences or suitable habitat for special-status plants documented in the proposed project study area,
- delineate waters of the United States (including wetlands) using the U.S. Army Corps of Engineer's (Corps') 1987 Wetland Delineation Manual (Environmental Laboratory 1987),
- map noxious weed infestations (see the definition below for species considered noxious weeds in this analysis),
- gather information to assist project engineers with route design through identification of sensitive vegetation and wetland resource constraints and avoidance opportunities, and
- coordinate with state and federal resource agencies to develop measures that avoid or minimize impacts on vegetation and wetland resources.

The field surveys for botanical resources were conducted by survey crews driving the project routes (where possible) and surveying on foot those areas that could provide habitat for special-status plants with the potential to occur in the region. Survey crews walked areas that were not accessible by road to locate special-status plants, noxious weeds, and wetlands. In general, floristic survey guidelines described by Nelson (1987) were used to locate special-status plants along the project routes (except for the Point Arena to Sacramento route, where surveys were not initiated until early June because of access issues, and where a habitat assessment rather than surveys was conducted for early blooming plants). All species were identified to the level necessary to determine whether they would qualify as special-status plants. Floristic survey field forms were completed by the botanical teams for each project route surveyed, and these forms were used to document species encountered during the field surveys. Special-status plant populations were documented on a CNPS

field survey form, photographed, flagged, and mapped on topographic maps. These special-status plant species are also being located on the construction drawings for each project route.

Surveys at proposed sites of regenerator/OP-AMP stations are being conducted for botanical resources that are identifiable at the time of the survey. A habitat assessment is being conducted for all special-status plants that are not identifiable at the time of the survey. If suitable habitat is located during the field survey, Jones & Stokes Associates will recommend that Williams select an alternative site. As discussed in Chapter 2, an environmental compliance checklist form (**Appendix F**) will be completed pursuant to CEQA requirements for any alternative sites and submitted to the California Public Utilities Commission (CPUC) for review and approval. **Table 4.IV-1** lists the survey dates, survey personnel, and survey purposes for each project route. Jones & Stokes Associates has been and is currently coordinating with the Corps, USFWS, and DFG to discuss Endangered Species Act, wetland, and riparian issues.

Table 4.IV-1. Vegetation, Wetland, and Wildlife Field Surveys Conducted for Each Project Route

Survey Personnel	Survey Dates	Survey Purpose
Point Arena to Sacramento		
John Dittes, BA/MS Josephine Guardino, BA/MS John Hale, BA/MS Rosemary Carey, BS/MS Becky Rozumowicz, BS Ryelle Leverett, BS Loran May, BA Matt Gause, BA Brent Helm, BA/PhD Andrew Dyer, BA/MS/PhD Mandy Tu, BA/MS/PhD Janet Klein, BA Bill Roper, BA Michael Plotkin, BA Jim Estep, BS	May 3–5, 1999 June 7–11, 1999 June 14–18, 1999 June 23 and 24, 1999 June 28–31, 1999 June 5, 6, 13, 19, 20, 1999	Wildlife and botany reconnaissance survey Wetland delineation Floristic plant surveys Noxious weed infestation mapping Wildlife surveys
Sacramento to California/Nevada Border		
John Dittes, BA/MS Josephine Guardino, BA/MS Bob Holland, BA/PhD Virginia Dains, BA/MS Rosemary Carey, BS/MS Petra Unger, BA/MS Ron Unger, BA/MS Jim Estep, BS Doug Leslie, BS/MS Todd Sloat, BS/MS	December 10, 1998 January 12, 1999 March 4, 5, 9, 11, 12, 1999 April 17, 1999 June 7–11, 1999 March 1–7, 1999 March 10, 11, 12 1999 April 12–18, 1999 April 19–23, 1999 May 4–8, 1999 May 10–14, 1999 June 4–21, 1999	Wildlife and botany reconnaissance surveys Wildlife surveys Wetland delineation Floristic plant surveys Noxious weed infestation mapping
San Francisco to Santa Clara		
John Dittes, BA/MS Becky Rozumowicz, BA Brian Zettle, BS Mike McNabb, BS	December 1, 1999	Wetland delineation

Table 4.IV-1. Vegetation, Wetland, and Wildlife Field Surveys Conducted for Each Project Route

Survey Personnel	Survey Dates	Survey Purpose
	June 8 and 25, 1999	Habitat assessment for special-status plants Wildlife habitat assessment
Pittsburg to Sacramento		
John Dittes, BA/MS	December 1, 1999	Wildlife and botany reconnaissance survey
Josephine Guardino, BA/MS John Hale, BA/MS Petra Unger, BA/MS	February 16–20, 1999 June 10–12, 1999 May 10–12, 1999	Wildlife surveys
Ron Unger, BA/MS Becky Rozumowicz, BS	February 1–7, 1999	Wetland delineation
Mandy Tu, BS/PhD Jim Estep, BS	February 15–21, 1999	Floristic plant surveys
Steve Avery, BS/MS	April 12–20, 1999 June 22–25,1999	Noxious weed infestation mapping
San Luis Obispo to Bakersfield		
Robert Preston, BA/PhD	February 18 and 26, 1999 March 3, 1999	Wildlife and botany reconnaissance surveys
John Hale, BA/MS Steve Jones, BA	March 26 - April 2, 1999	Floristic surveys
Doug Leslie, BS/MS Will Kohn, BS Jim Estep, BS	April 12, 13, 26–30, 1999 June 14–16, 1999 June 21–23, 1999	Wetland delineation
Deborah Dorsett, BS/MS	March 29 - April 3, 1999 May 24–26, 1999	Wildlife surveys
San Luis Obispo to Los Osos Loop		
Robert Preston, BA/PhD	February 11, 1999	Morro shoulderband snail habitat assessment
Christopher Rogers	April 3, 1999	Wildlife and botany reconnaissance surveys
Doug Leslie, BS/MS	April 7 and 8, 1999	Wildlife surveys
Will Kohn, BS	January 25, 1999	Floristic surveys
	April 13, 1999	Wetland delineation
Riverside to California/Arizona Border		
John Dittes, BA/MS	February 1 and 2, 1999	Wildlife and botany reconnaissance surveys
Josephine Guardino, BA/MS	February 8–10, 1999	Wetland delineation
Steve Jones, BS Rosemary Cary, BA/MS Stephanie Myers, BS/MS Jennifer Haire, BS	March 21–31, 1999 April 1 and 2, 1999 May 24–30, 1999 June 29–30, 1999	Floristic surveys
Randy Wilson, BS/MS John Hale, BS/MS	March 10–14, 23–26, 1999 March 23–24, 1999 March 29 - April 4, 1999	Wildlife surveys
Los Angeles to Riverside		
Rob Wiese, BS Gerold Dion, BS/MS	February 8–10, 1999	Wildlife and botany reconnaissance surveys
Debra Dorsett, BS/MS Stephanie Myers, BS/MS	March 23–26, 1999	Floristic surveys Wetland delineation
Jennifer Haire, BS Jim Estep, BS	June 7–10, 1999	Wildlife surveys

Table 4.IV-1. Vegetation, Wetland, and Wildlife Field Surveys Conducted for Each Project Route

Survey Personnel	Survey Dates	Survey Purpose
Los Angeles to Anaheim		
Rob Wiese, BS Gerold Dion, BS/MS Debra Dorsett, BS/MS Rosemary Carey, BA/MS	February 1 and 2, 1999	Floristic surveys
	May 27, 1999 June 24 and 31, 1999	Wetland delineation
	April 26 - May 6, 1999 May 10, 12,and 13, 1999 June 16, 17, and 18, 1999	Wildlife surveys

Plant Communities

Each project route encompasses a variety of geologic formations, climatic conditions, and associated plant communities. Two floristic provinces are encountered: the California Floristic Province and the Desert Province. Major geographic subdivisions crossed include the North Coast, North Coast Ranges, Sierra Nevada foothills, high Sierra Nevada, Sacramento Valley, San Joaquin Valley, San Francisco Bay Area, South Coast Ranges, South Coast, Transverse Ranges, Peninsular Ranges, and Sonoran Desert. The definition and boundaries of geographical divisions follows the Jepson Manual (Hickman 1993).

Descriptions and names of plant communities are based on Jones & Stokes Associates' field surveys and on descriptions found in Holland (1986) and Sawyer and Keeler-Wolf (1995). Although the system of Sawyer and Keeler-Wolf represents the most recent treatment and includes greater community detail than the system of Holland, it is incomplete for many geographical areas in California. Additionally, some of the plant communities described in this IS/MND do not fit well into the communities circumscribed by either Sawyer and Keeler-Wolf or Holland. Therefore, some community type names have been developed based on Jones & Stokes Associates' field observations.

For the purpose of this document, plant communities are subdivided into common and sensitive community types, as defined below.

Common Plant Communities. Common plant communities are native or naturalized habitats that have not been substantially altered and that still provide habitat functions and values. Most of the plant communities in the proposed project study area are locally and regionally common.

Sensitive Plant Communities. For this IS/MND, sensitive plant communities are those communities that are especially diverse, regionally uncommon, considered sensitive natural communities (as defined by Holland 1986), or regulated by state or federal agencies (e.g., Section 404 of the Clean Water Act). Most sensitive plant communities are given special consideration because they provide important ecological functions, including providing water quality maintenance and essential habitat for plants and wildlife. Some plant communities support a unique or diverse assemblage of plant species; therefore, they are considered sensitive from a botanical standpoint.

Noxious Weeds

Noxious weed infestation and dispersal have been identified by the U.S. Bureau of Land Management (BLM) and the U.S. Forest Service (USFS) as issues of concern and could affect several of the project routes that pass through lands managed by BLM or USFS. Because noxious weeds have been identified as issues of concern, they are addressed in this IS/MND. Two federal acts and one executive order direct weed control:

the Carlson-Foley Act of 1968, Federal Noxious Weed Act of 1974, and a federal executive order on invasive species (February 3, 1999). Additionally, BLM supports a policy of controlling noxious weeds on BLM land (U.S. Bureau of Land Management 1985). Local counties are also concerned about noxious weed infestation and dispersal on private and public lands. To identify noxious weed species of concern along each project route, the following sources were consulted:

- a list of species designated as federal noxious weeds by the U.S. Department of Agriculture;
- county agricultural commissions;
- California Department of Food and Agriculture's "A", "B", and "C" lists of noxious weeds;
- California Exotic Pest Plant Council list of pest plants of ecological concern;
- BLM noxious weed lists (Ukiah and Desert Conservation Field Offices); and
- Tahoe National Forest noxious weed list.

For the purpose of this analysis and field surveys, a noxious weed is a plant that has the potential to displace native plants and natural habitats, affect the quality of forage on rangelands, or affect cropland productivity. High-priority noxious weeds include all California Department of Food and Agriculture's A rated species. Some B and C rated species were included in this analysis if they were identified by the BLM, USFS, or county agricultural commissions as target noxious weeds. Additional weeds were included if they were considered to have great potential for displacing native plants and damaging natural habitats and are not considered too widespread to be effectively controlled. Noxious weed mapping is currently being done on all project routes and is 25% complete to date. Noxious weed infestations are being documented by mapping polygons of noxious weeds and assigning a level of infestation. These levels include the following:

- Level 1 Infestation: less than 1 percent absolute cover,
- Level 2 Infestation: 2 percent to10 percent absolute cover,
- Level 3 Infestation: 11 percent to50 percent absolute cover, and
- Level 4 infestation: 51 percent to 100 percent absolute cover.

Noxious weed locations, infestation levels, and proposed wash stations will be provided to the appropriate land management and resource agencies (including the CPUC) prior to construction. **Table 4.IV-2** lists the high-priority noxious weeds identified by these sources and indicates which weed species were observed along each project route.

Table 4.IV-2. Noxious Weed Species of Concern

Common/Scientific Name[a]	County Agricultural Commissions and CalEPPC Lists[d]	USFS List[e]	BLM Lists [f]	Noxious Weeds Observed along the Project Routes[g]								
				1	2	3	4	5	6	7	8	9
Biddy biddy (*Acaena nova-zelandiae*)	✓											
Pale biddy biddy *(Acaena pallida*)	✓											
Punagrass *(Achnatherum brachychaetum*)	✓											
Camelthorn *(Alhagi pseudalhagi*)	✓											
Alligatorweed (*Alternanthera philoxeroides*)	✓											
European beach grass (*Ammophila arenaria*)	✓											
Giant reed (*Arundo donax*)		✓		✓		✓				✓		
Capeweed (*Arctotheca calendula*)	✓				✓							
White-top, hoary cress (*Cardaria draba* [b])	✓					✓			✓			
Plumeless thistle (*Carduus acanthoides*)	✓											
Musk thistle (*Carduus nutans*)	✓	✓										

Table 4.IV-2. Noxious Weed Species of Concern

Common/Scientific Name[a]	County Agricultural Commissions and CalEPPC Lists[d]	USFS List[e]	BLM Lists [f]	Noxious Weeds Observed along the Project Routes[g]								
				1	2	3	4	5	6	7	8	9
Whitestem distaff thistle (*Carthamus leucocaulos*)	✓											
Purple starthistle (*Centaurea calcitrapa*[a])	✓					✓		✓	✓			
Diffuse knapweed (*Centaurea diffusa*)	✓	✓										
Iberian starthistle (*Centaurea iberica*)	✓											
Spotted knapweed (*Centaurea maculosa*)	✓	✓										
Squarrose knapweed (*Centaurea squarrosa*)	✓					✓						
Skeletonweed *(Chondrilla juncea*)	✓	✓			✓							
Yellowspine thistle (*Cirsium ochrocentrum*)	✓											
Wavyleaf thistle (*Cirsium undulatum*)	✓											
Narrow-leaved iceplant, roundleaf iceplant (*Conicosia pugioniformis*)	✓											
Andean pampas grass, jubatagrass (*Cortaderia jubata)*	✓		✓	✓	✓							
Pampas grass (*Cortaderia selloana*)	✓											
Cotoneaster (*Cotoneaster pannosa*)	✓			✓								
Bearded creeper (*Crupina vulgaris*)	✓											
Dudaim melon *(Cucumis melo var. dudaim*)	✓											
Giant dodder (*Cuscuta reflexa*)	✓											
Artichoke thistle (*Cynara cardunculus* [b])	✓					✓		✓				
Scotch broom (*Cytisus scoparius* [c])	✓			✓	✓			✓				
Portuguese broom (*Cytisus striatus*)	✓											
Veldt grass (*Ehrharta calycina*)	✓								✓			
Veldt grass *(Ehrharta erecta*)	✓											
Russian olive (*Elaeagnus angustifolia*)	✓			✓								
Leafy spurge (*Euphorbia esula*)	✓											
Serrate spurge *(Euphorbia serrata*)	✓											
Fennel (*Foeniculum vulgare*)	✓			✓	✓	✓		✓	✓			
French broom (*Genista monspessulana*[c])	✓			✓	✓							
Russian salttree (*Halimodendron halodendron*)	✓											
Halogeton *(Halogeton glomeratus*)	✓	✓										
English ivy (*Hedera helix*)	✓			✓	✓	✓						
Blueweed (*Helianthus ciliaris*)	✓											
Tanglehead (*Heteropogon contortus*)	✓											
Hydrilla (*Hydrilla verticillata*)	✓		✓									
Dyers woad (*Isatis tinctoria* [b])	✓	✓										
Perennial pepperweed (*Lepidium latifolium* [b])	✓	✓	✓	✓	✓	✓						
Glossy privet (*Ligustrum lucidum*)	✓											
Dalmation toadflax (*Linaria genistifolia ssp.) dalmatica*	✓	✓										
Bush lupine (Pt. Arena only) (*Lupinus arboreus*)	✓											
Purple loosestrife (*Lythrum salicaria* [b])	✓	✓										
Myoporum (*Myoporum laetum*)	✓											
Onopordum thistles (*Onopordum spp.*)	✓	✓			✓							
Cooper's broomrape (*Orobanche ludoviciana* var. *cooperi)*	✓											
Branched broomrape (*Orobanche ramosa*)	✓											
Harmel (*Peganum harmala*)	✓											
Kikuyu grass (*Pennisetum clandestinum*)	✓											
Fountain grass (*Pennisetum setaceum*)	✓							✓				

Table 4.IV-2. Noxious Weed Species of Concern

Common/Scientific Name[a]	County Agricultural Commissions and CalEPPC Lists[d]	USFS List[e]	BLM Lists [f]	Noxious Weeds Observed along the Project Routes[g]								
				1	2	3	4	5	6	7	8	9
Lippia (in vernal pools) *(Lippia nodiflora*)	✓					✓						
Smooth groundcherry (*Physalis virginiana var. sonorae*)	✓											
Creeping mesquite (*Prosopis strombulifera*)	✓											
Bridal broom (*Retama monosperma*)	✓											
Himalaya blackberry (incipient populations only) (*Rubus discolor*)	✓			✓	✓	✓						
Wormleaf thistle (*Salsola damascena*)	✓											
Russian thistle (*Salsola tragus*)	✓			✓	✓					✓		
Meadow sage *(Salvia pratensis*)	✓											
Chinese tallow (*Sapium sebiferum*)	✓											
Brazilian pepper (*Schinus terebinthifolius*)	✓											
Mediterranean grass (*Schismus arabicus*)	✓							✓		✓		
Mediterranean grass (*Schismus barbatus*)	✓									✓		
Golden thistle (*Scolymus hispanicus*)	✓	✓	✓									
German ivy (*Senecio mikanioides*)	✓											
Heartleaf nightshade (*Solanum cardiophyllum*)	✓											
Torrey's nightshade (*Solanum dimidiatum*)	✓											
Perennial sowthistle (*Sonchus arvensis*)	✓											
Spanish broom (*Spartium junceum*)	✓											
Austrian peaweed (*Sphaerophysa salsula*)	✓											
Witchweed (*Striga asiatica*)	✓											
Wild marigold (*Tagetes minuta*)	✓											
Athel *(Tamarix aphylla*)	✓											
Tamarisk, salt cedar (*Tamarix chinensis, T. gallica, T. parviflora, T. ramosissima*)	✓		✓	✓		✓				✓		
Gorse (*Ulex europaeus*[b])	✓	✓										
Syrian beancaper (*Zygophyllum fabago*)	✓											

Notes:

Key to Project Routes:

1 = Point Arena to Sacramento
2 = Sacramento to the California/Nevada Border
3 = Pittsburg to Sacramento
4 = San Francisco to Santa Clara
5 = San Luis Obispo to Bakersfield
6 = San Luis Obispo to Los Osos Loop
7 = Riverside to the California/Arizona border
8 = Los Angeles to Riverside
9 = Los Angeles to Anaheim

[a] All California Department of Food and Agriculture A Rated Weeds (noxious weeds mandated for eradication or containment by that agency) are included in this table. Additionally, some species from the California Exotic Pest Plant Council (CalEPPC) lists are also included based on recommendations made by Ron Unger, a weed ecologist at Jones & Stokes Associates.

[b] Species listed as B on the California Department of Food and Agriculture list of noxious weeds. These species are more widespread than A listed weeds and therefore difficult to contain. The agency leaves eradication or containment to the discretion of the County Agricultural Commissioners.

[c] Species listed as C on the California Department of Food and Agriculture list of noxious weeds. These species are so widespread the agency generally does not endorse state- or county-funded eradication or containment efforts except in nurseries or seed lots.

[d] County Agricultural Commission Sources: Sacramento, Placer, Nevada, Sierra, San Luis Obispo, Kern, Mendocino, Lake, Colusa, Yolo,

Table 4.IV-2. Noxious Weed Species of Concern

Common/Scientific Name[a]	County Agricultural Commissions and CalEPPC Lists[d]	USFS List[e]	BLM Lists[f]	Noxious Weeds Observed along the Project Routes[g] 1	2	3	4	5	6	7	8	9

Sutter, Sonoma, Solano, Napa, Yolo, Contra Costa, Los Angeles, Orange, San Bernadino, Riverside, Imperial, and San Mateo counties. The noxious weed species lists provided by the counties remain on file at Jones & Stokes Associates and are available for review.

[e] USFS Sources: Tahoe National Forest, Nevada City .

[f] BLM Sources: Desert Conservation Field Office, Riverside and Ukiah Field Office.

[g] Surveys for noxious weed species are 25% complete to date. This table will be updated as more information becomes available.

Waters of the United States (Including Wetlands)

For the purpose of this document, the term waters of the United States is an encompassing term used by the Corps for areas that would qualify for federal regulation under Section 404 of the Clean Water Act. Waters of the United States are separated into wetlands and other waters of the United States.

Wetlands are defined as areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 Code of Federal Regulations [CFR] 328.3[b], 40 CFR 230.3). For a wetland to qualify as jurisdictional by the Corps and therefore be subject to regulation under Section 404 of the Clean Water Act, the site must support a prevalence of hydrophytic vegetation, hydric soils, and wetland hydrology. Wetlands were identified in the field based on the Corps' definition of waters of the United States.

Other waters of the United States are sites that typically lack one or more of the three indicators identified above. Other waters of the United States identified in the proposed project study area include drainages, playas, alkali flats, and unvegetated clay pools. For the purpose of this document, drainages include all streams, creeks, rivers, and other surface features with defined beds and banks.

Wetlands were delineated using the methods outlined in the Corps 1987 Wetlands Delineation Manual. The Corps district offices were contacted to obtain an agreement on the wetland mapping and documentation methods.

Lists of waters of the United States delineated for each of the project routes to date are provided in **Appendix G**. A brief description of these waters of the United States is provided in the project-specific discussions later in this chapter. Detailed descriptions and locations of waters of the United States (including wetlands) that were delineated by Jones & Stokes Associates can be found in the wetland delineation reports prepared for each project route. (See **Appendix D** for a sample wetland delineation report.) These delineation reports are 75% complete. Copies of these delineation reports will be available for review after July 31, 1999, and can be obtained from Jones & Stokes Associates, KEA Environmental, and the CPUC.

Special-Status Plant Species

Information on occurrences of special-status plants in the proposed project study area was obtained initially from the NDDB (1999), the U.S. Fish and Wildlife Service (USFWS) (**Appendix L**), and reconnaissance-level surveys of the project routes. Additional information on species' habitat requirements, blooming periods, and

field identifying characteristics was obtained from state floras (Munz and Keck 1973, Hickman 1993), from the CNPS inventory (Skinner and Pavlik 1994), and coordination with the BLM and USFS.

For the purpose of this IS/MND, the term special-status plants is defined as species that are:

- listed or proposed for listing as threatened or endangered under the federal Endangered Species Act (federal ESA) (50 CFR 17.12 for listed plants and various notices in the Federal Register for proposed species);
- candidates for possible future listing as threatened or endangered under the federal ESA (58 FR 188: 51144-51190, September 30, 1993);
- federal species of concern (former C2 candidates);
- listed by the State of California as threatened or endangered under the California Endangered Species Act (CESA) (14 CCR 670.5);
- plants considered sensitive by BLM or USFS;
- plants listed as rare under the California Native Plant Protection Act of 1977 (California Fish and Game Code, Section 1900 et seq); and
- plants considered by CNPS to be "rare, threatened, or endangered in California" (Lists 1B and 2, and selected Lists 3 and 4 species identified in Skinner and Pavlik 1994).

A total of 365 listed special-status plant species were identified during a pre-field survey investigation as potentially occurring in the proposed project study area, including 68 plant species presently federally listed as threatened or endangered, four species proposed for listing as threatened or endangered under the federal ESA, and 293 species that fall under one of the remaining special-status criteria (**Appendix K-3**). Species located to date are indicated in this table with an asterisk (*). Discussions of special-status plants located during 1999 surveys are presented under specific project route descriptions.

Wildlife Resources

Methods

The goal of the wildlife resource studies conducted for the proposed project was to obtain sufficient information to adequately assess the potential impacts of the proposed project on wildlife resources along each of the project routes. To accomplish this goal, the following tasks were conducted:

- obtain and review existing information on wildlife resources known to be present in the proposed project study areas;
- conduct habitat-based field surveys (described below) to describe and evaluate habitat types and species associations along the project routes;
- if necessary, conduct species-specific field surveys (described below) for special-status wildlife species;

- gather information to assist project engineers with route design through identification of sensitive wildlife resource constraints and avoidance opportunities; and

- coordinate with state and federal resource agencies to develop measures that avoid or minimize impacts on wildlife resources.

Table 4.IV-1 lists the survey dates, survey personnel, and survey purposes for each project route.

Prefield Survey Investigation. Before field surveys were conducted, existing and available information was gathered and reviewed to determine the location and types of wildlife resources that could exist in each proposed project study area, including resource management plans and other environmental documents prepared for projects in the study area. Information on species occurrences was also gathered from statewide databases through contacts with the Natural Heritage Division and Nongame and Endangered Wildlife Section of DFG. Contacts were made with resource specialists from the BLM, DFG, USFS, and USFWS to gather file information on wildlife resources in the proposed project study area, including mapped and database information (**Appendix L**). Contacts were made by telephone, through correspondence, and through office visits.

All existing resource information was mapped onto U.S. Geological Service (USGS) 7.5-minute topographic quadrangle maps. Lists of all special-status wildlife species with potential to occur in the proposed project study area, along with their legal status, distribution, and habitat association, are provided in **Appendix K-4**.

Habitat-Based Field Surveys. Qualified wildlife biologists conducted habitat-based field surveys in each of the proposed project study areas (refer to the setting discussion for each project route provided later in this section). Surveyors visited each project route right-of-way and mapped habitat types within and adjacent to the right-of-way. Generally, habitats were mapped and evaluated within a 0.5-mile-wide corridor. The objectives of these surveys were to:

- complete a detailed habitat-based resource survey of the entire right-of-way and surrounding area to characterize habitat type, quality, and species associations, and

- evaluate habitat for threatened, endangered, candidate, and other special-status wildlife species that were identified as having the potential to occur in the proposed project study area.

Species-Specific Field Surveys. Based on the results of the prefield survey investigation and habitat-based surveys, species-specific surveys were or will be conducted and will coincide with the timing of construction. These surveys will include the following components:

- surveys to identify and map habitat for specific listed species and other special-status species, and

- surveys to determine presence or absence (where possible) of specific special-status wildlife species.

Species-specific habitat mapping has been conducted for several species, including San Joaquin kit fox, blunt-nosed leopard lizard, giant kangaroo rat, and northern spotted owl. Species-specific surveys have been conducted for Delta green ground beetle and Morro shoulderband snail. Several approaches may be used to detect species and avoid or minimize impacts during construction. Species-specific surveys will be conducted

using resource agency protocols where needed to determine presence or absence of certain species, followed by establishment of no-disturbance buffer zones in active areas. In some cases, particularly where survey protocols are costly to implement, Williams may simply assume the presence of the species and implement construction mitigation measures and habitat compensation. Where special-status species are assumed or confirmed as occurring, standardized survey methods, as required by the applicable state or federal agency, may also be used just before construction to ensure the absence of special-status species from the construction right-of-way.

Preconstruction surveys using USFWS established protocols may be conducted for the following species:

- blunt-nosed leopard lizard,
- desert tortoise,
- Coachella Valley fringe-toed lizard,
- northern spotted owl,
- California spotted owl,
- northern goshawk,
- least Bell's vireo,
- southwestern willow flycatcher,
- San Joaquin kit fox,
- San Joaquin antelope ground squirrel,
- giant kangaroo rat,
- Tipton's kangaroo rat, and
- Steven's kangaroo rat.

Other species that may be surveyed prior to construction to ensure avoidance during the construction year include:

- mountain yellow-legged frog,
- foothill yellow-legged frog,
- northern red-legged frog,
- tailed frog,
- Couche's spadefoot toad,
- western pond turtle,
- golden eagle,
- peregrine falcon,
- prairie falcon,
- white-tailed kite,
- Cooper's hawk,
- sharp-shinned hawk,
- opsrey,
- Swainson's hawk,
- northern harrier,
- burrowing owl,
- snowshoe hare,
- white-tailed jackrabbit,
- Sierra Nevada mountain beaver, and
- American badger.

If, during construction, the proposed construction technique developed to avoid sensitive resources (e.g., boring) is determine to be infeasible, then alternative measures will be evaluated to ensure avoidance of sensitive resources identified during initial surveys or during preconstruction surveys. This may require additional environmental review and coordination with the CPUC and responsible resource agencies for approval.

Special-Status Wildlife Species

Various information was gathered and reviewed to develop a list of threatened, endangered, candidate, and other special-status wildlife species that are to exist or could exist in the project study area. Several data sources were reviewed to develop this list, including database records from the NDDB (1999), published and unpublished literature, and results of reconnaissance-level field surveys.

In this IS/MND, the term special-status wildlife includes species that are:

- listed or proposed for listing as threatened or endangered under the federal ESA (50 CFR 17.11 [listed animals] and various notices in the Federal Register for proposed species);
- candidates for possible future listing as threatened or endangered under the federal ESA (58 FR 188: 51144-51190, September 30, 1993);
- federal species of concern (former C2 candidates);
- listed by the state of California as threatened or endangered under CESA (14 CCR 670.5);
- animals considered sensitive or of special interest by BLM or USFS;
- animal species of special concern to DFG (Remsen 1978 [birds] and Williams 1986 [mammals]); and
- animal species fully protected in California (Cal. Fish and Game Code, Sections 3511 [birds], 4700 [mammals], and 5050 [reptiles and amphibians].

Discussions of various special-status wildlife species are presented later in the section under the "Threatened, Endangered, Candidate, and Other Special-Status Species". There are a total of 50 state- or federally listed wildlife species and 131 nonlisted special-status wildlife species that could exist in the proposed project study area (**Appendix K-4**).

Agency Coordination. All of the project routes involve coordination with state and federal resource agencies, including the Corps, California Department of State Lands, and DFG. Initial coordination with the USFWS was also made for all project routes in the form of project notification and a species request letter; however, some project routes also require more extensive agency coordination. The BLM is the lead agency for preparation of an environmental assessment and Section 7 biological assessment for the Riverside to California/Arizona border project. A Section 10 habitat conservation plan is currently being prepared for the San Luis Obispo to Bakersfield project route through the Sacramento Field Office of the USFWS. The Tahoe National Forest is the lead agency for a categorical exclusion and biological evaluation being prepared for the Sacramento to California/Nevada border project.

Fisheries Resources

Methods

Fisheries resources were evaluated for each project route. Information on fish and fish habitats in, and downstream of, the proposed project study area was obtained from personal communications with regulatory agency staff, NDDB, published literature, and previously prepared environmental documents. Personal communications used for this assessment included information from USFWS and National Marine Fisheries Service (NMFS) (**Appendix L**), and communications with DFG (Hine, Marshal, McGwire, Roper, and Taveres pers. comms.). Literature reviewed is listed in Chapter 6, "Citations", under Moyle 1976; Leidy 1984; Sigler and Sigler 1987; Swift et al. 1989; Swift et al. 1993; Moyle et al. 1995; Busby et al. 1996; Jones & Stokes Associates 1995, 1997, and 1998; and Titus et. al in press. For the purposes of this CEQA analysis, information is provided for named mapped drainages found on USGS 7.5-minute quadrangle maps. All drainages (waters of the United States) were inventoried during field surveys as part of the permitting processes

for each project route. Each drainage was then evaluated to determine the potential presence of special-status fish species. Streams that were determined to potentially support special-status fish were considered occupied for purposes of this IS/MND.

A Jones & Stokes Associates fisheries biologist and the project engineer are conducting preconstruction surveys of each identified waterbody to determine if the recommended methods of avoiding each site are feasible and to ensure that the appropriate construction specifications are conveyed to the contractor. The recommended methods will include boring under the water body or bridge attachment, where available.

Special-Status Fish Species

For the purpose of this IS/MND, the term special-status fish includes species that are:

- listed or proposed for listing as threatened or endangered under the federal ESA (various notices in the Federal Register for proposed species);
- candidates for possible future listing as threatened or endangered under the federal ESA (58 FR 188: 51144-51190, September 30, 1993);
- federal species of concern (former C2 candidates);
- USFS management indicator species;
- listed by the State of California as threatened or endangered under the CESA (14 CCR 670.5); and
- California state species of concern.

Special-status fish species potentially associated with each project route are discussed in more detail later in this section. Lists of all special-status fish species with potential to occur in the proposed project study area, along with their legal status, distribution, and habitat association, are provided in **Appendix K-5**. A total of 30 special-status fish species could exist in drainages crossed by the project routes, including 10 fish species presently listed as threatened or endangered under the federal ESA, three species proposed for listing as threatened or endangered under the federal ESA, and 12 species that are federal species of concern.

Regulations, Approvals, and Permits Applicable to Biological Resources

This section describes the federal and state regulations, permits, and policies pertaining to biological resources and applicable to the proposed project. The following would only apply to the affected project routes. **Appendix B** provides applicable regulations, approvals, and permits by project route.

U.S. Army Corps of Engineers and U.S. Environmental Protection Agency Regulation of Waters of the United States, Including Wetlands

The Corps and EPA regulate the discharge of dredged or fill material into waters of the United States, including wetlands, under Section 404 of the Clean Water Act. Projects that would result in the placement of dredged or fill material into waters of the United States require a Section 404 permit from the Corps. Some classes of fill activities may be authorized under general permits if specific conditions are met.

Utility line construction activities, such as fiber optic cable installation activities, that result in the placement of fill into waters of the United States generally may be covered under Section 404 Nationwide Permit No. 12 (at the discretion of the Corps). Nationwide permits do not authorize activities that are likely to jeopardize the existence of a threatened or endangered species (listed or proposed for listing under the federal ESA) or that may affect properties listed or eligible for listing in the National Register of Historic Places (56 FR 59134-59138, November 22, 1991). In addition to conditions outlined under each nationwide permit, project-specific conditions may be required by the Corps as part of the Section 404 permitting process.

The federal government also supports a policy of minimizing "the destruction, loss, or degradation of wetlands." Executive Order 11990 (May 24, 1977) requires that each federal agency take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. BLM does not have a separate wetland policy but supports this executive order.

Wetland delineations are currently being prepared for each project route. Williams will request authorization of the project routes under Nationwide Permit No. 12 for each route, as applicable.

U.S. Forest Service Policies on Wetlands

In response to Executive Order 11990, the USFS has identified floodplain management and wetland protection objectives and policies to minimize impacts on wetland resources (Forest Service Manual 2527). Some of the objectives of Forest Service Manual 2527 are to minimize destruction, loss, and degradation of wetlands and preserve and restore the natural and beneficial values of floodplains and wetlands. USFS has identified several policies to meet these objectives, including the following:

- Avoid adverse impacts that may be associated with occupancy and modification of floodplains and with destruction, loss, or degradation of wetlands.

- Do not permit floodplain development and new construction in wetlands wherever there is a practicable alternative.

- Preserve and enhance the natural and beneficial values of wetlands.

Federal Policies on Riparian Communities in California

Riparian communities have a variety of functions, including providing high-quality habitat for resident and migrant wildlife, streambank stabilization, and runoff water filtration. Throughout the United States, riparian habitats have declined substantially in extent and quality compared with their historical distribution and condition. These declines have increased concerns about dependent plant and wildlife species, leading federal agencies to adopt policies to arrest further loss. USFWS mitigation policy identifies California's riparian habitats as belonging to resource Category 2, for which no net loss of existing habitat value is recommended (46 FR 7644, January 23, 1981).

As described below, the USFS and BLM "PACFISH" decision established riparian habitat management goals and a riparian habitat conservation area (RHCA) on certain federal lands. PACFISH does not apply to all of the project routes.

State Policies and Regulations on Streams and Wetlands

DFG regulates activities that would interfere with the natural flow of, or substantially alter, the channel, bed, or bank of a lake, river, or stream. These activities are regulated under the California Fish and Game Code (Section 1601 for public agencies and Section 1603 for private individuals). Requirements to protect the integrity of biological resources and water quality are often conditions of streambed alteration agreements. Requirements may include avoidance or minimization of the use of heavy equipment, limitations on work periods to avoid impacts on wildlife and fisheries resources, and measures to restore degraded sites or compensate for permanent habitat losses. Streambed alteration agreements will be obtained only when necessary.

Interim Strategies for Managing Anadromous Fish-Producing Watersheds

The Interim Strategy for Managing Anadromous Fish-Producing Watersheds in Eastern Oregon and Washington, Idaho and Portions of California (U.S. Forest Service and U.S. Bureau of Reclamation 1995), commonly referred to as PACFISH, is a USFS/BLM management strategy designed to decrease the deterioration of salmonid habitat on federal lands. BLM and national forest lands in California are within the authority of this management strategy; therefore, any activities that occur on these lands must address compliance with PACFISH. However, not all of the project routes are affected by PACFISH.

PACFISH establishes riparian habitat management goals to maintain or restore various aquatic habitat components, such as water quality; stream channel integrity; sediment regimes; instream flows; diversity and productivity of riparian plant communities; thermal regulation; natural variability of erosion and channel migration; and habitat to support populations of plant, vertebrate, and invertebrate populations, that contribute to the viability of riparian-dependent communities.

To meet these objectives, PACFISH also establishes RHCAs on certain federal lands that delineate where riparian-dependent resources are to receive primary emphasis, and management activities are subject to specific standards and guidelines. RHCAs include traditional riparian corridors, wetlands, intermittent streams, and other areas that help to maintain the integrity of aquatic ecosystems.

Construction and management activities can occur within RHCAs if the activities are consistent with PACFISH standards and guidelines, they meet the riparian management objectives, and they avoid adverse effects on listed anadromous fish.

Federal Endangered Species Act

USFWS (jurisdiction over plants, wildlife, and resident fish) and NMFS (jurisdiction over anadromous fish and marine fish and mammals) oversee the federal ESA. Section 7 of the act mandates that all federal agencies consult with USFWS and NMFS to ensure that the federal agencies' actions do not jeopardize the continued existence of a listed species or destroy or adversely modify critical habitat for listed species. The federal agency is required to consult with USFWS and NMFS if it determines a "may effect" situation will occur in association with the proposed project. To determine the presence of federally listed species in the proposed project study area, letters were sent to USFWS requesting lists of federally listed and proposed species that could exist in the project study area.

The federal ESA prohibits the "taking" of any fish or wildlife species listed as endangered, including the destruction of habitat that prevents the species recovery. Take is defined as harassing, harming, pursuing,

hunting, shooting, wounding, killing, trapping, capturing, collecting, or attempting to engage in any such conduct. Fish and wildlife federally listed as threatened also are generally protected from take; however, the overall level of protection for these species may be modified at the time of their listing.

Under Section 9 of the federal ESA, the take prohibition applies only to wildlife and fish species. However, Section 9 does prohibit the unlawful removal and reduction to possession, or malicious damage or destruction of, any endangered plant from federal land. Section 9 prohibits acts to remove, cut, dig up, damage, or destroy an endangered plant species in nonfederal areas in knowing violation of any state law or in the course of criminal trespass. Candidate species and species that are proposed or under petition for listing receive no protection under Section 9 of the federal ESA.

Section 10 of the federal ESA requires the issuance of an "incidental take" permit before any public or private action may be taken that would potentially harm, harass, injure, kill, capture, collect, or otherwise hurt (i.e., take) any individual of an endangered or threatened species. The permit requires preparation and implementation of a habitat conservation plan that would offset the take of individuals that may occur, incidental to implementation of the project by providing for the overall preservation of the affected species through specific mitigation measures.

Federal Migratory Bird Treaty Act

The Migratory Bird Treaty Act states that without a permit issued by the U.S. Department of the Interior, it is unlawful to pursue, hunt, take, capture, or kill any migratory bird.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act makes it illegal to import, export, take (which includes molest or disturb), sell, purchase, or barter any bald eagle or golden eagle or eagle part.

California Endangered Species Act

California implemented its own Endangered Species Act in 1984. The state act prohibits the take of endangered and threatened species; however, habitat destruction is not included in the state's definition of take. Section 2090 of CESA requires state agencies to comply with endangered species protection and recovery and to promote conservation of these species. DFG administers the act and authorizes take through Section 2081 agreements (except for designated "fully protected species").

Regarding rare plant species, CESA defers to the California Native Plant Protection Act of 1977, which prohibits importing of rare and endangered plants into California, taking of rare and endangered plants, and selling of rare and endangered plants. State-listed plants are protected mainly in cases where state agencies are involved in projects under CEQA. In this case, plants listed as rare under the California Native Plant Protection Act are not protected under CESA but can be protected under CEQA.

California Fish and Game Code

Section 3503.5 of the California Fish and Game Code prohibits the removal of raptor nests. Section 1603 of the California Fish and Game Code also requires issuance of a streambed alteration agreement for all projects that may disturb streams.

Native and Heritage Tree Ordinances

Some cities and counties have adopted native or heritage tree ordinances or policies to protect large or native trees. Most ordinances or policies require the project applicant to obtain a tree removal permit and compensate for the removal of protected trees. Local cities and counties will be contacted to determine if they have adopted policies or ordinances. The specific compensatory mitigation will be determined as part of the permit process for applicable project routes. However, removal and indirect impacts on heritage and native trees will be avoided and minimized to the fullest extent possible during construction.

Habitat Conservation Plans

Some cities, counties, or private entities may have adopted habitat conservation plans (HCPs) under Section 10 of the federal ESA. HCPs provide a mechanism for conserving habitat for federally listed threatened, endangered, and proposed species while allowing specified levels of take as defined under a Section10(a) incidental take permit. A similar process under CESA, the Natural Communities Conservation Plan (NCCP), may also be applicable in some areas. The existence and applicability of HCPs and NCCPs along the project routes will be determined through contacts with local cities and counties and state and federal resource agencies. Any specifications or guidelines described in any operational HCP or NCCP encountered by any of the project routes will be applied to that project route.

Proposed Project Route Settings

Refer to Chapter 3 for detailed descriptions of the project route and associated facilities. Common and scientific names of species mentioned in the text are provided in **Appendix K**.

Point Arena to Sacramento

The project route passes through an area bounded by Point Arena on the Pacific Coast, the interior of the Central Valley near Sacramento on the south, and Robbins to the north. Two major physiographic provinces are encountered, the Central Valley and the north Coast Ranges (consisting of the outer and inner Coast Ranges). The outer Coast Ranges consist primarily of forest lands, where the maritime climate produces long-duration, low-intensity storms in winter and abundant fog and fog-drip precipitation in summer. Most of these lands are privately owned redwood forest lands that have been used as industrial timberlands for many years. Dense stands of hardwoods, primarily tanoak, have grown up in recently harvested areas. Most of the conifer forests are in younger age classes although small pockets of mature redwood forest are found throughout the area, some of which are protected under California State Park ownership. Throughout this region, the soils tend to be shallow and rocky and the mountain slopes relatively steep. Two major coastal rivers, the Garcia and Russian rivers, are located in the project study area, typically supporting a narrow band of hardwood riparian forest leading into surrounding conifer forest. The project route heads southeast from Point Arena to Fish Rock, passing through the redwood forests along the Garcia River drainage and several coastal drainages, then turn east past Yorkville and into the Russian River drainage over the Mayacmas Mountains and into the inner Coast Ranges.

The inner Coast Ranges consist mainly of oak woodland and chaparral lands, often on steep slopes, with drier weather conditions. Interspersed within the mountains are small- to medium-sized coastal valleys that are typically used for cattle grazing or agriculture, and most of which are partially urbanized with small towns. At Kelseyville, the route continues south of Clear Lake in road rights-of-way. The route continues through the inner Coast Ranges and into the agricultural habitats of the Central Valley.

The Central Valley consists nearly entirely of agricultural lands on deep, alluvial soils with a climate of warm, dry summers and cool, wet winters. Between the foothills of the inner Coast Range on the western edge of the Central Valley to Sacramento, the landscape is dominated by row and grain crop agricultural lands. Remnants of valley oak woodland, either small groves or lone trees, occasionally are found in this area. Narrow corridors dominated by oak and cottonwood riparian forest are found along rivers, such as the Sacramento River, and along smaller creeks and sloughs, such as Cache Creek. The route terminates in the town of Robbins, crossing Cache Creek; the Colusa Basin; the Sacramento River; and numerous creeks, ditches, canals, and sloughs.

Vegetation and Wildlife. Survey methods used to identify vegetation and wildlife resources along this route were described previously in this section.

Common Plant Communities and Associated Wildlife Habitats

Agricultural Lands. Agricultural lands are found primarily in the Central Valley portion of the proposed project study area; however, some coastal valleys also are either under cultivation or are grazed by cattle. Row, grain, and hay crops are the dominant crop pattern along the project route. Depending on the crop pattern and the proximity to native habitats, agricultural lands can provide relatively high-value habitat for wildlife, particularly as foraging habitat. Raptor species use row and grain crop agricultural lands for foraging because several species of common rodents are found in agricultural fields. Agricultural habitats also provide foraging and resting habitat for migrating and wintering waterfowl and shorebirds.

Annual Grassland. Annual grassland is a herbaceous community found throughout the Coast Range portion of the proposed project study area. Grasslands are found on ridges, hill slopes, and valley floors. Typical plant species include a mix of dominant non-native grasses, such as soft chess, red brome, ripgut brome, foxtail barley, wild oats, and annual fescues, intermixed with forb species, such as clovers, lupines, owl's clover, popcorn flower, poppies, and various species of filaree. Some areas have been subject to frequent disturbance, such as grazing and maintenance activities along roadsides. The annual grassland vegetation in these areas may be dominated by ruderal introduced weedy species, such as yellow star-thistle, tocalote, and Mediterranean mustard.

Although wildlife species richness in annual grasslands is moderate, species diversity is high. Grasslands are important because they support insects, amphibians, reptiles, and small birds and mammals that are preyed on by other wildlife, including red-tailed hawks, northern harriers, American kestrels, burrowing owls, coyotes, and gray foxes. Grasslands near open water and woodland habitats are used by the greatest number of wildlife species because they provide places for resting, breeding, and escape cover.

Annual grassland is a common plant community regionally and statewide. It stabilizes soils, protects watersheds from erosion, and provides forage for wildlife and livestock.

Chamise Chaparral. Chamise chaparral is a dominant chaparral community in the inner Coast Ranges. The dominant and characteristic species is chamise, sometimes intermixed with wedgeleaf ceanothus, bigberry manzanita, and California buckwheat. The understory is typically composed of bulbous perennials, such as soap plant; Fremont's death camas; mariposa lilies; and herbaceous forbs, including evening-primroses, spineflowers, chia, and cryptantha.

Chaparral plants provide browse, berries, and seeds for a variety of birds, such as California quail, northern mockingbird, American robin, hermit thrush, spotted towhee, California towhee, dark-eyed junco, and

golden crowned sparrow. Insectivorous birds, such as orange-crowned warbler, bushtit, and Bewick's wren, feed on insects in chaparral foliage. Many bird species also find nesting and roosting sites and protection from predators in chaparral habitats. Numerous rodents inhabit chaparral habitats, and deer, rabbits, and hares make extensive use of chaparral habitats sources of food and cover. Additionally, chaparral provides habitat for other mammals and reptiles, including gray fox, coyote, deer mice, western fence lizard, western rattlesnake, and gopher snake.

Foothill Pine-Oak Woodland. Foothill pine-oak woodland is found primarily in the inner Coast Ranges along the project route. It transitions to blue oak woodland and annual grassland at lower elevations. Mixed chaparral is found in inclusions and forms the shrubby understory component in some woodland areas. Foothill pine-oak woodland is dominated by a varying mixture of blue oak and foothill pine. At higher elevations, scattered black oak, bigleaf maple, and California bay are also present. Associated shrub and subshrub species include many that are common to mixed chaparral, including toyon, manzanita, coffeeberry, redberry, California buckeye, redbud, buckbrush, mountain mahogany, poison oak, lemonadeberry, bedstraws, and live oaks.

Herbaceous species are mostly lacking in woodlands that contain a well-developed shrub layer. In open areas, herbaceous species include many that are common to the adjacent blue oak woodland/grass and annual grassland plant communities.

Foothill pine-oak woodland provides important breeding, foraging, and cover habitat for most of the wildlife species common to the inner Coast Ranges. The upper canopy provides nesting, foraging, and cache sites for many birds, such as Lewis's woodpecker, acorn woodpecker, northern flicker, oak titmouse, western bluebird, mourning dove, and red-tailed hawk, and the understory shrub layer provides habitat for many common bird species, such as golden and white-crowned sparrows, and small mammals, such as the dusky-footed woodrat.

Blue Oak Woodland/Grass. Blue oak woodland/grass is common in the inner Coast Range along the project route. Blue oak woodland/grass is dominated by blue oak. Other tree species found in blue oak woodland/grass include foothill pine and coast live oak. Although scattered shrubs are present in blue oak woodland/grass, such as wedgeleaf ceanothus, the understory consists primarily of grasses and forbs typical of California annual grassland, including ripgut brome, Pacific fescue, common fiddleneck, and miner's-lettuce. Small stands of native grassland also occur in blue oak woodland, including purple needlegrass and pine bluegrass. Blue oak woodland/grass is a common plant community regionally and statewide.

A variety of birds, mammals, and reptiles find cover and nesting habitat in blue oak woodlands. Acorns are a particularly important food source for several bird and mammal species, such as scrub jay, western gray squirrel, and California ground squirrel.

North Coast Alluvial Redwood Forest. The north coast alluvial redwood forest community is found on alluvial flats associated with the deep, well-drained soils of river plains on the north coast of California. This community is found within the fog-belt region of the northern coastal forests from the California/Oregon border to portions of central California, extending to approximately 30 miles from the coast. It is dominated by coast redwood with an understory consisting largely of redwood sorrel and sword fern. This community is found primarily in the low-lying areas adjacent to larger streams, such the Garcia River, and intergrades with upland redwood forest.

Because the complexity of the vegetation in north coast alluvial redwood forests is relatively low, wildlife diversity is also typically low compared with other forest types. Redwood trees overwhelmingly dominate these stands, which often lack a midstory and shrub layer. Northern spotted owls inhabit this forest type because of the nesting opportunities in large redwood trees and the openness below the upper canopy providing space for flight. Marbled murrelet, a seabird that nests in large redwood trees, is most often associated with mature and old growth alluvial redwood forests along streams. Olive-sided flycatcher, winter wren, and pileated woodpecker also are found nesting in this forest type. Several amphibian species, including tailed frog and southern torrent salamander, are found in streams in alluvial redwood forests because of the cool, moist microclimatic conditions. Large broken-top redwood and Douglas-fir trees along streams provide nesting opportunities for osprey that hunt along rivers and off the coast.

Upland Redwood Forest. Upland redwood forest generally exists on the shallow, well-drained soils of steep slopes. It is similar to north coast alluvial redwood forest but is not as tall and includes a greater diversity of tree species and a more shrubby understory (Holland 1986). Upland redwood forest is the prevalent community in the proposed project study area within approximately 30 miles of the coast. It is characterized by coast redwood in the upper canopy, with Douglas-fir usually dispersed throughout this layer, and a secondary tree layer consisting of tanoak, Pacific madrone, and interior live oak. The canopy cover of the shrub layer is usually moderate to dense, consisting of California huckleberry, salal, and rose bay. Associated understory plants include deer fern, bracken fern, sword fern, redwood violet, and modesty. Saprophytes, such as phantom orchid and striped candyflower, are found sporadically on the forest floor. Red alder is also found in this community, typically as a narrow band along watercourses.

Compared with alluvial redwood forests, upland redwood forests support a greater diversity of wildlife species. These stands tend to support a more complex vegetative structure, with one or more codominant upper canopy species, such as Douglas-fir, grand fir, Sitka spruce, or western hemlock; a midstory layer; and a shrub understory. Bird species found in these forests include Hutton's vireo, bushtit, hermit warbler, Bewick's wren, American robin, and dark-eyed junco. Northern goshawk, northern spotted owl, and Cooper's hawk are also known to nest in these stands. Several amphibians, including northern red-legged frog and foothill yellow-legged frog, are found in streams and adjacent uplands in redwood forests, and mammals, such as Pacific shrew, Townsend's chipmunk, and gray squirrel, are common. Specific habitat elements in redwood forests are particularly important for some species. For example, snags are essential for species, such as Vaux's swift, purple martin, white-breasted nuthatch, and arboreal and clouded salamanders. Downed wood is an important habitat element for California slender salamander, Douglas' squirrel, gray fox, and Pacific fisher.

Upland Douglas Fir Forest. Upland Douglas fir forest consists primarily of Douglas fir trees in the upper canopy with redwood as a codominant species. In the Coast Range, this community exists occasionally on relatively drier south-facing slopes, from the coast to approximately 40 miles inland but is found primarily at more inland sites. Tanoak and madrone typically are found in the secondary layer. A sparse to moderate shrub layer consists primarily of rhododendron, evergreen huckleberry, and salal.

Wildlife in upland Douglas fir forest is similar to upland redwood forests. Ash throated flycatcher, olive-sided flycatcher, Pacific-slope flycatcher, northern flicker, red-breasted nuthatch, winter wren, and a variety of other birds are found in these forests. Small mammals, such as dusky-footed woodrat and deer mouse, and larger mammals, such as black bear and black-tailed deer, also exist.

Tanoak Woodland and Forest. Tanoak woodland and forest are found sporadically throughout the north coast but individual tanoak trees are common components of the redwood forest community. In some

areas, however, tanoak is the dominant species, particularly at more inland sites, both as a result of soil conditions and historic logging practices. Tanoak woodland and forest typically are found on xeric, rocky sites, often at the margins of redwood or Douglas-fir forests and particularly on the upper slopes and ridgetops. Tanoak woodland and forest are characterized by a dense canopy of evergreen sclerophyllous trees, primarily tanoak and madrone, although interior live oak is common at mesic sites on inland ridges. Redwood and Douglas-fir are found as codominant species on steep, rocky, well-drained hillside slopes. The shrub layer consists of California buckeye and western azalea. The herbaceous plant layer is typically characterized by very little cover, although sword fern may occasionally predominate.

Wildlife associated with this habitat are similar to that found in redwood and Douglas-fir forests, which tend to border the tanoak forest.

Sensitive Plant Communities and Associated Wildlife Habitat

Valley Riparian Forest. Valley riparian forest is a dense, broadleafed, winter deciduous forest dominated by one or more large trees, such as Fremont cottonwood, valley oak, and western sycamore. Riparian forest generally exists in the upper floodplains, outside of the area annually scoured by the active stream channel. The canopy is generally closed and composed of several layers. Other common tree species include box-elder, northern California black walnut, Oregon ash, red willow, and Goodding's willow. Understory shrubs include buttonbush, California rose, and poison oak. California grape is also an important component of denser, less disturbed riparian forest.

Despite widespread disturbances from urbanization, agricultural conversion, and grazing, riparian forest remains an important wildlife resource because of its scarcity regionally and statewide and because the riparian community is used by a large variety of wildlife species. This habitat produces abundant aquatic and terrestrial invertebrates that are prey for amphibians and reptiles, such as common garter snakes, western skinks, and ringneck snakes, as well as insectivorous birds, such as warblers, northern flickers, downy woodpeckers, and flycatchers. Small mammals found in riparian habitats include shrews, voles, bats, and mice. Raptors that nest in large riparian trees include great-horned owls, red-tailed hawks, and American kestrels. Cavity-dependant species, such as woodpeckers, bats, squirrels, and raccoons, require mature stands of trees. Striped skunks, red foxes, gray foxes, and badgers forage in riparian habitats and use them for cover and travel.

Valley riparian forest is an uncommon plant community regionally and statewide because of historic and continuing habitat loss. It is an essential community to many unique plant and animal species.

Red Alder Riparian Forest. Red alder riparian forest exists along the banks of watercourses, particularly larger streams, such as the Garcia River. This community is found on moist, rich, alluvial soils. Broad-leaved deciduous trees characterize the canopy layer. The dominant tree is red alder, with California bay-laurel a co-dominant species in some areas, and bigleaf maple found occasionally. The understory is characterized by thickets of stink current, salmonberry, and vine maple. Typical low-growing forbs are pig-a-back plant, redwood sorrel, boykinia, and candyflower. Several types of fern are prevalent. Columbine and monkeyflower are found along the banks of the slower moving watercourses.

This habitat provides stream shading important to fish and aquatic amphibians and nesting, foraging, and cover habitat for riparian birds.

Red alder riparian forest is a sensitive plant community because of historic and continuing habitat loss of riparian forests statewide and because it is an essential community to many unique plant and animal species.

Valley Oak Woodland. Valley oak woodland exists primarily in small remnant patches on the floor of the Central Valley and in valleys of the inner Coast Range. Valley oak woodland consists of an open woodland dominated by valley oak. The understory consists of grasses and forbs typical of annual grassland, such as ripgut brome and common fiddleneck, but includes shade-tolerant non-native forbs, such as oriental mustard, dwarf nettle, and milk thistle. Valley oak woodland is a sensitive plant community because it has become uncommon from conversion to agriculture and because regeneration is inhibited by heavy grazing and competition from non-native species.

These woodlands are especially important to wildlife because they provide valuable forage, cover, and nesting habitat for many ground, shrub, and tree-nesting species. Woodpeckers excavate nest holes in live and dead oaks, and these cavities are subsequently used by other species, such as American kestrels, western screech owls, tree swallows, ash-throated flycatchers, white-breasted nuthatches, plain titmice, and western bluebirds. Oak acorns provide an important food source for many species, including band-tailed pigeons, acorn woodpeckers, scrub jays, western gray squirrels, and black-tailed deer.

Oak foliage and bark attract insects that are important to the diet of birds, such as white-breasted nuthatches, plain titmice, Bewick's wrens, ruby-crowned kinglets, American robins, Cassin's vireos, Hutton's vireos, orange-crowned warblers, black-headed grosbeaks, Bullock's orioles, and house finches.

The grasslands understories of valley oak woodlands offer foraging habitat and cover for Pacific treefrogs, western fence lizards, California quails, northern flickers, black-tailed hares, deer mice, gray foxes, and black-tailed deer.

Valley oak woodland is an uncommon plant community regionally and statewide because of historic and continuing habitat loss from agricultural conversion and urbanization.

Emergent Marsh. The emergent marsh plant community may occur along the project route wherever year-round, shallow, standing water is present. It is associated with the edges of canals, irrigation ditches, sloughs, some perennial drainages, and riverbanks. Emergent marsh is dominated by perennial emergent species, including cattail, tule, three-square, and false sedge. In tidal areas, such as around San Pablo Bay and Suisun Marsh, the marsh community is dominated by pickleweed and other salt-tolerant species. Annual species, such as water smartweed, duckweed, and annual rabbit's-foot grass, are also common in emergent marsh.

The narrow band of emergent marsh vegetation along canals, ditches, and other drainages provides nesting and foraging opportunities for water bird species and small mammals, including mallards, green-winged teals, great blue herons, great egrets, marsh wrens, song sparrows, red-winged blackbirds, raccoons, and California voles.

Emergent marsh is a sensitive community because of historic and continuing loss of wetland habitats from agricultural conversion, urbanization, and flood control development.

Seasonal Wetlands. For the purpose of this programmatic document, seasonal wetlands along the project include seasonal pools that would not be considered vernal pools, groundwater seeps, and seasonal wetlands along roadside and natural drainages. Seasonal wetlands potentially exist along all portions of the

project route. Seasonal wetlands typically are inundated only during the rainy season, and the vegetation is composed of wetland-adapted annual grasses and forbs. These sites provide habitat for waterbirds and amphibians, and provide a source of water for many animals.

Fish. The Garcia River provides habitat for northern California coast evolutionarily significant unit (ESU) steelhead, southern Oregon-California coastal ESU chinook salmon, central California coast ESU coho salmon, pikeminnow, and prickly sculpin. The Russian River supports central California coast ESU steelhead, southern Oregon-California coast ESU chinook salmon, central California coast ESU coho salmon, American shad, striped bass, rainbow trout, Russian River tule perch, hardhead, and Navarro roach.

Largemouth bass, rainbow trout, crappie, and catfish are found in Lake Berryessa. Rainbow trout are also found in reaches of Putah Creek closer to Lake Berryessa. The Sacramento River and the connected tributary streams and sloughs support a number of fish species, including all four runs of Central Valley chinook salmon (fall-/late fall-run, spring-run, and Sacramento River winter run ESUs); Central Valley ESU steelhead; delta and longfin smelt; Sacramento splittail; green and white sturgeon; Pacific and river lampreys; and various trouts, shad, squawfish, sculpins, suckers, perches, bass, and roach.

The Clear Lake drainage supports the Clear Lake hitch, which spawns in several tributaries to the lake. Where the route crosses Cache Creek, the creek supports a number of native fish, including hardhead, pikeminnow, speckled dace, and California roach. The Sacramento River and the connected tributary streams and sloughs support a number of fish species, including all four runs of Central Valley chinook salmon (fall-/late fall-run, spring-run, and Sacramento River winter-run ESUs).

Threatened, Endangered, Candidate, and Other Special-Status Species

Threatened, Endangered, Candidate, and Other Special-Status Plants. A total of 128 special-status plants have the potential to occur in the vicinity of the project route (**Appendix K-3**). Of these, 27 species are federally listed as threatened or endangered, 25 are state listed as threatened or endangered, and 94 are nonlisted special-status plants. Surveys along the Point Arena to Sacramento project route are complete. The following special-status plants have been located in the proposed project study area:

- California sedge, a CNPS List 2 species. One occurrence of this sedge species was located in the coastal region of the project route and can be found on the Point Arena quadrangle.

- Glandular western flax, a CNPS List 1B species. Four occurrences of this flax were located in the project route and can be found on the Highland Springs and Kelseyville quadrangles.

- Burke's goldfields, a federal and state listed endangered species and CNPS List 1B species. One occurrence of this endangered plant was located in the proposed project study area and can be found on the Clearlake Highlands quadrangle.

- Bare monkeyflower, a CNPS List 4 species. One occurrence of this species was located in the proposed project study area and can be found on the Wilbur Springs quadrangle.

Threatened, Endangered, Candidate, and Other Special-Status Wildlife. A total of 69 special-status wildlife species have the potential to occur in the proposed project study area (**Appendix K-4**). Of these, 14 species are federally listed as threatened or endangered, 13 are state listed as threatened or

endangered, and 50 are nonlisted special-status wildlife species. The following special-status wildlife species or habitat for these species were located along the project route:

- Swainson's hawk. Several active nests were located on or near the project route in the Central Valley portion of the proposed project study area.

- Valley elderberry longhorn beetle (VELB). Numerous elderberry shrubs, the host plant for VELB, were located along the project route in the Central Valley and Coast Range foothills.

- Giant garter snake. Several perennial drainages were located along the Central Valley portion of the project route that potentially support giant garter snake.

- Foothill yellow-legged frog. Numerous drainages in the Coast Ranges portion of the project route were identified as having potential to support foothill yellow-legged frog.

- Northern red-legged frog. Several perennial drainages in the outer Coast Ranges portion of the project route were identified as having potential to support northern red-legged frog.

- Northern harrier. One northern harrier nest was found along the project route between Woodland and Sacramento.

- Burrowing owl. One active burrowing owl nest was found along the project route in the Natomas Basin.

- Northern spotted owl and northern goshawk. Two small sites were located in the Coast Ranges portion of the project area that are considered suitable nesting/roosting habitat for northern spotted owl and northern goshawk.

- Point Arena mountain beaver. Several drainage crossings and some adjacent habitat near Point Arena was identified as having potential to support Point Arena mountain beaver.

Appendix K-4 provides the status, distribution, and habitat requirements of all potentially occurring special-status species, and the wildlife resource tables in **Appendix G** for locations of special-status species or habitat along the project route.

Threatened, Endangered, Candidate, and Other Special-Status Fish. A total of 20 special-status fish species have the potential to occur in the proposed project study area (**Appendix-5**). Of these, seven are federally listed as threatened or endangered, four are state listed as threatened or endangered, and 10 are nonlisted special-status fish species.

Sacramento to the California/Nevada Border

The project route extends across two major physiogeographic provinces, the northern Sierra Nevada range and the Sacramento Valley, and four major watersheds, the Truckee, Yuba, Bear, and American river watersheds. The portion of the proposed project study area analyzed in this document begins at the California/Nevada border west of Verdi in Sierra County and extends west within the Truckee River Canyon along the Union Pacific Railroad (UPRR) right-of-way to Truckee. The main upland plant communities/habitat associations along this section include eastside yellow pine forest, big sagebrush scrub, low sagebrush scrub,

and rabbitbrush scrub. Riparian habitats associated with the floodplain of the Truckee River and its tributary streams include montane black cottonwood riparian forest and woodland, and willow scrub. Montane wet meadow habitats are also associated primarily with the margins of the Truckee River and other drainages.

From Truckee west to Blue Canyon, the project route follows an existing AT&T telecommunications corridor and county roads. Along this segment, the project route climbs in elevation, travels near Donner Pass, continues west past Emigrant Gap and descends the west slope of the Sierra Nevada toward Blue Canyon. The main upland plant communities along this section include eastside yellow pine forest, mixed conifer forest, and Jefferey pine fir forest at the highest elevations. Riparian habitats and moister areas support lodgepole pine forest, montane black cottonwood forest, aspen riparian forest and scrub, willow scrub, and occasional montane wet meadows.

From Blue Canyon to Colfax, the project route drops in elevation as it continues along the existing AT&T corridor that parallels old SR 40. The main upland plant communities/habitat associations along this segment include mixed conifer forest and westside ponderosa pine forest.

From Colfax to Sacramento, the project route once again follows the UPRR right-of-way as it descends the west slope of the Sierra Nevada into the Sacramento Valley. Major upland plant communities along this segment include mixed conifer forest, westside ponderosa pine forest, foothill pine forest and woodland, blue oak woodland/grass, and foothill and valley annual grassland. Riparian areas support willow scrub and white alder scrub. Wetland plant communities in this area include seasonal wetlands and emergent marsh.

Vegetation and Wildlife. Survey methods used to identify vegetation and wildlife resources along this route were described previously in this section.

Common Plant Communities and Associated Wildlife Habitat

Annual Grassland. Annual grassland occupies understory sites and open habitats from the foothill pine/oak woodland along the west slope of the Sierra Nevada to the floor of the Sacramento Valley. Refer to the Point Arena to Sacramento project route for a discussion of this plant community and its wildlife associations.

Ruderal. Disturbed habitats are found in the proposed project study area along roadsides and other developed or disturbed areas. Where vegetated, these sites are dominated by weedy non-native and weedy native species. Disturbed habitats in the eastern portion of the proposed project study area tend to be dominated by cheatgrass, rubber rabbitbrush, and bulbous bluegrass. Disturbed habitats in forested areas support a higher proportion of native herbaceous and shrub species, which are more common in openings in the surrounding natural plant community. Disturbed habitats along the west slope are occupied by mostly non-native annual grassland species. Star thistle and prickly lettuce are particularly abundant at some of these sites.

Although often comprised of non-native plant species, ruderal habitats, particularly at edges of natural communities, can provide foraging habitat for many species of birds and mammals. On the lower portions of the western slope and in the Central Valley, these habitats can be occupied by ground squirrels and other rodents, and can support burrowing owl nest sites.

Big Sagebrush Scrub. Big sagebrush scrub is found in the eastern segment of the proposed project study area from the California/Nevada border to the vicinity of Truckee. This community occupies openings and margins of eastside yellow pine forest. Big sagebrush scrub is dominated by big sagebrush, with scattered

rabbitbrush, antelope bitterbrush, and occasional serviceberry and horsebush. The relatively barren openings support scattered grass species such as squirreltail, needlegrass, bluegrass, and cheatgrass. Common forb species include lupines, Indian paintbrush, mule ears, annual phlox, and small baby blue eyes. Big sagebrush scrub is a common plant community regionally and statewide. It stabilizes soils and provides cover and forage for wildlife and livestock.

Sagebrush habitats in eastern California generally support wildlife species adapted to arid environments. Typical resident bird species in these habitats include sage sparrow, horned lark, loggerhead shrike, green-tailed towhee, barn owl, and sage grouse. Raptors, such as golden eagle, red-tailed hawk, and American kestrel, use sagebrush habitats to hunt small mammals, such as deer mice, white- and black-tailed jackrabbits, Belding's ground squirrels, and Townsend's and Richardson's ground squirrels. Larger mammals, such as pronghorn and mule deer are common, as are larger mammalian predators, such as bobcat and coyote.

Low Sagebrush Scrub. Low sagebrush dwarf scrub is located in scattered areas in the vicinity of Truckee Meadows, where it grows in relatively shallow, poorly drained soils. Low sagebrush scrub is dominated by a sparse cover of low sagebrush, with scattered one-sided bluegrass, squirreltail, and various forb species, including lupine, daisies, spreading phlox, Beckworth's violet, annual phlox, and small baby blue eyes.

Wildlife use of low sagebrush scrub is similar to that described under big sagebrush scrub.

Montane Black Cottonwood Forest and Woodland. Montane black cottonwood forest and woodland is located in the proposed project study area, principally in association with the floodplain of the Truckee River and occasionally with smaller drainages at higher elevations. This plant community is dominated by a relatively dense to open canopy of black cottonwood, with scattered conifer species that area common to surrounding forest communities. Other shrub species include willows, chokecherry, sagebrush, and interior rose. Herbaceous species include false Solomon's seal, selfheal, clovers, aster, and blue wild rye.

Wildlife associations in this habitat type are generally similar to willow riparian habitat described below, and because it tends to be contiguous with wet meadow and mixed conifer forest habitats, also provides nesting, cover, and foraging value for species that use those habitat types.

Foothill Pine-Oak Woodland. Foothill pine-oak woodland exists in the project study area at lower elevations on the west slope of the Sierra Nevada range. Foothill pine-oak woodland intergrades with westside ponderosa pine/mixed hardwood forest at higher elevations and with blue oak woodland and annual grassland at lower elevations. Mixed chaparral forms the shrubby understory in places. Foothill pine-oak woodland is dominated by a varying mixture of blue oak and foothill pine. At higher elevations, scattered black oak, bigleaf maple, and California bay are also present. Associated shrub and subshrub species include some that are common to mixed chaparral, including toyon, manzanita, coffeeberry, redberry, California buckeye, buckbrush, mountain mahogany, poison oak, and live oak. Herbaceous species are mostly lacking where the shrub layer is best developed. In open areas, herbaceous species include many that are common to the adjacent blue oak woodland/grass and annual grassland plant communities.

Because this habitat type intergrades with several others at lower elevations of the Sierra Nevada, it supports diverse vegetative characteristics, and may also provide high-value breeding, cover, and foraging values to many wildlife species. Numerous birds, large and small mammals, and reptiles are found in this habitat type. Streams at this elevation may also support several amphibian species, such as foothill yellow-legged frog.

Blue Oak Woodland/Grass. Blue oak woodland/grass occupies lower elevation sites of the west slope and foothills of the Sierra Nevada range. This community is found in areas with relatively thin, rocky soils and at elevations below the foothill pine oak woodland plant community. Blue oak woodland/grass intergrades with foothill pine-oak woodland at higher elevations and is replaced by annual grassland in thinner soils and at lower elevations. Refer to the Point Arena to Sacramento route for a discussion of this plant community and its wildlife associations.

Eastside Yellow Pine Forest. Eastside yellow pine forest is the dominant upland plant community in the region between the California/Nevada border and the area just west of Truckee. It is associated with big sagebrush scrub and intergrades with mixed conifer forest in the moister, higher areas to the west. Eastside yellow pine forest is dominated by an overstory of Jeffery pine growing alone or with ponderosa pine. Common shrub species include big sagebrush, antelope bitterbrush, greenleaf manzanita, tobacco bush, gooseberries, and mat mahala. Common herbaceous species include woolly mule's ears, California helianthella, beardtongues, coyote mint, lupines, and butterweed. Perennial grass species include western needlegrass, squirreltail, Idaho fescue, and various bluegrasses.

This habitat typically has a relatively open structure with a sparse understory of sagebrush and other arid-tolerant species. This habitat supports many of the plant and wildlife species found in sagebrush habitats as well as species more commonly found in forested habitats. Northern flicker, red-breasted nuthatch, brown creeper, golden mantled ground squirrel, and western grey squirrel are common species in this habitat type. Northern goshawk, Stellar's jay, pileated and hairy woodpecker, fisher, and marten potentially exist in older, dense stands.

Sierran Mixed Conifer Forest. Sierran mixed conifer forest is the dominant montane plant community between Truckee and the upper elevations of the west slope of the Sierra Nevada range. Sierran mixed conifer forest transitions into westside ponderosa pine forest to the west and with the more arid, eastside yellow pine forest to the east. In wetter, poorly drained sites, mixed conifer forest is replaced by lodgepole pine forest. Sierran mixed conifer forest is dominated by a relatively dense mixed overstory canopy of ponderosa pine, sugar pine, Douglas fir, white fir, and incense cedar. Scattered understory shrub and subshrub species include manzanitas, tobaccobush, mat mahala, mountain whitethorn, bush chinquapin, mountain lilac, and gooseberries. Common understory herbs and grass species are varied and include beardtongues, everlasting, kellogia, white hawksbeard, sweet-cicely, and bracken fern. Common grasses include mountain brome, needlegrasses, bluegrasses, onion grass, and blue wild rye.

Near the project route, stands of mixed conifer forest also have a relatively open structure with some larger trees or groups of larger trees present, and small, isolated patches of older forest in a few places. These forests intergrade with yellow pine forests and lodgepole pine forests and support many of the same wildlife species. Red crossbills, Williamson's sapsuckers, western tanagers, mountain chickadees, dusky-footed woodrats, and Douglas squirrels are common species associated with this habitat type. California spotted owls, winter wrens, olive-sided flycatchers, blue grouse, and western red-backed voles may exist in older stands. Streams at this elevation provide habitat for mountain yellow-legged frog. Larger conspicuous mammals include black bear and mule deer.

Lodgepole Pine Forest and Woodland. Lodgepole pine forest and woodland is located in the proposed project study area at the upper elevation sites between Truckee and Emigrant Gap in wetter areas along creeks and at the margins of wet meadows. Lodgepole pine forest and woodland are dominated by uniform and relatively dense stands of lodgepole pine, with occasional quaking aspen and willow. Except for scattered Sierra gooseberry, there are typically few shrub species present. Scattered herbaceous plant species

include yarrow, sticky cinquefoil, selfheal, mountain strawberry, and various clovers. Grasses and grasslike species, needlegrass, slender hairgrass, bluegrasses, and sedges.

Along the project route, lodgepole pine forest and woodland intergrade with Sierran mixed conifer forest, and provides similar values to wildlife.

Westside Ponderosa Pine Forest. Westside ponderosa pine forest occupies the mid-elevation sites on the west slope of the Sierra Nevada range. This community intergrades with Sierran mixed conifer forests at higher elevations to the east and with foothill pine-oak woodland at lower elevations to the west. Ponderosa pine forest is dominated by a relatively dense to open canopy of ponderosa pine, with scattered incense cedar, and occasional Douglas fir, white fir, madrone, and canyon live oak. Black oak and big-leaf maple are also present and are the dominant canopy trees in some places. Shrub and subshrub species include mountain lilac, manzanitas, live oaks, coffeberry, and poison oak. Herbaceous species are varied and include wild iris, snub pea, aster, bracken fern, and woodland strawberry. Grasses include mountain brome, needlegrass, hedgehog dogtail, and oniongrass, and fescues.

This habitat type provides similar wildlife values as Sierran mixed conifer and foothill pine-oak woodland types. It provides habitat for numerous wildlife species characteristic to both conifer forest and oak woodland communities.

Sensitive Plant Communities and Associated Wildlife Habitat

Mixed Willow Riparian Forest and Woodland. These riparian communities are found along the Truckee River and scattered along the margins of drainages at montane sites in the proposed project study area. Mixed willow riparian forest and woodland are dominated by almost pure stands of shrubby willows, with occasional black cottonwood, quaking aspen, and white alder. Shrub species include interior rose and chokecherry. Where present, herbaceous grass and forbs include species common to surrounding wet meadow habitats and montane black cottonwood forest and woodland.

A variety of resident and migratory birds are found in mixed willow riparian forest and woodland, including song sparrow, spotted towhee, yellow-rumped warbler, and white-crowned sparrow. When associated with wet meadow habitat, willow scrub also provides habitat for willow flycatcher.

Mixed willow riparian forest and woodland is a sensitive community because riparian vegetation has declined statewide because of agricultural conversion, urbanization, and flood control development.

Montane Wet Meadow. Montane wet meadows are scattered throughout the higher elevation sites in the proposed project study area where they exist in association with the margins of drainages, springs, seeps, and other areas with shallow or perched groundwater tables. Wet meadows are dominated by a thick cover of grasses and grasslike species, including meadow barley, tufted hairgrass, bluegrasses, and mannagrass. Other grass-like species include blue-eyed grass and various rushes and sedges. Herbaceous forbs are well represented and include cinquefoils, beardtongues, asters, yarrow, selfheal, and clovers.

Montane wet meadows along the project route generally exist in small patches, providing open foraging habitat for birds and mammals. Lincoln sparrows, Brewer's and red-winged blackbirds, western meadowlarks, spotted towhees, and common garter snakes are species commonly associated with this habitat type.

Montane wet meadow is a sensitive community because it has a localized distribution, is sensitive to disturbance by cattle grazing, and provides important and unique habitat for many sensitive species.

Emergent Marsh. Emergent marsh is a wetland plant community found primarily on the west slope and in the Central Valley portions of the project route. It is associated with the edges of canals, irrigation ditches, sloughs, occasional perennial drainages, and riverbanks. Refer to the Point Arena to Sacramento route for a description of this plant community and associated wildlife species.

Open water habitat is sometimes associated with emergent marshes in rivers, sloughs, canals and perennial drainages crossed by the project route, such as the American River and Truckee River. Open water habitat is usually unvegetated, but supports emergent marsh, or riparian scrub around its shallower margins.

Emergent marsh is a sensitive community because these wetlands are uncommon because of agricultural conversion, urbanization, and flood control development.

Seasonal Wetlands. Seasonal wetlands were identified along the project route primarily on the lower west slope and in the Central Valley. They are associated principally with disturbed roadside depressions, the edges of seasonal drainages, and with groundwater seeps. Although much of the associated plant and wildlife species are also common to the emergent marsh community (see above), seasonal wetlands lack standing water for much of the year. No vernal pool or swale communities were located along this project route.

Fish. Fishes in the Truckee River include Lahontan cutthroat trout, tui chub, kokanee, brown and rainbow trout (introduced), Tahoe sucker, Lahontan speckled dace, mountain whitefish, Paiute sculpin, and Lahontan redside. Cui ui inhabit the lower Truckee River, but are not present in California sections of the river. Fishes supported in the headwaters of the Yuba River near the route include rainbow and brown trout and sculpin. The Bear River supports Central Valley ESU steelhead, Central Valley fall-/late fall-run ESU chinook salmon, catfish, bass, pikeminnow, hardhead, Sacramento sucker and bluegill. The North Fork American River in reaches near the route (above Folsom Dam) support rainbow trout, smallmouth bass, hardhead, and pikeminnow. The American River (below Folsom Dam) and tributaries to the Sacramento River mainstem can support a number of species including Central Valley ESU chinook salmon (fall-/late fall- and spring-runs), Central Valley ESU steelhead, delta and longfin smelt, Sacramento splittail, green and white sturgeon, Pacific and river lampreys, trout, shad, squawfish, stickleback, sculpins, suckers, perches, bass, and roach.

Threatened, Endangered, Candidate, and Other Special-Status Species

Threatened, Endangered, Candidate, and Other Special-Status Plants. A total of 47 special-status plant species have the potential to occur in the proposed project study area (**Appendix K-3**). Of these, none are federally listed as threatened or endangered, two are state listed as threatened or endangered, and 45 are nonlisted special-status plant species. Surveys along the Sacramento to California/Nevada border route are 90 percent complete to-date. A late season return survey will be conducted in the Sierra Nevada mountains segment in late July. The following two special-status plants have been located in the proposed project study area to-date:

- Plumas ivesia, a USFS sensitive and a CNPS List 1B species. Two occurrences were located directly within the proposed study area, east of Truckee. These occurrences are part of a very large population and are located on the Truckee quadrangle.

- Starved daisy, a CNPS List 1B species. Several occurrences of this species were located between Big Bend and Donner Pass. They can be found on the Cisco Grove and Norden quadrangles.

Threatened, Endangered, Candidate, and Other Special-Status Wildlife. A total of 58 special-status wildlife species have the potential to occur in the project study area (**Appendix K-4**). Of these, seven species are federally listed as threatened or endangered, 10 are state listed as threatened or endangered, and 37 are nonlisted special-status species. The following special-status wildlife species or habitat for these species were located along the project route:

- Valley elderberry longhorn beetle. Numerous elderberry shrubs, the host plant for VELB, were located along the project route in the Central Valley and Sierra Nevada foothills.

- Foothill yellow-legged frog and California red-legged frog. Several streams along the project route in the low to mid-elevation Sierra Nevada portion of the proposed project study area were considered potential habitat for foothill yellow-legged frog and/or the California red-legged frog.

- Mountain yellow-legged frog. Several streams along the project route in the higher elevation areas of the Sierra Nevada were considered potential habitat for the mountain yellow-legged frog.

- California spotted owl and northern goshawk. Several small sites along the project route in the mid- to high elevation Sierra Nevada were considered suitable nesting/roosting habitat for California spotted owl and northern goshawk.

- Willow flycatcher. Two sites adjacent to the project route in the high elevation Sierra Nevada were identified as having potential to support willow flycatcher.

Appendix K-4 provides the status, distribution, and habitat requirements of all potentially-occurring special-status species, and the wildlife resource tables in **Appendix G** provide the locations of special-status species or habitat along the project route.

Threatened, Endangered, Candidate, and Other Special-Status Fish. A total of 10 special-status fish species have the potential to occur in the proposed project study area (**Appendix K-5**). Of these, four species are federally listed as threatened or endangered, two are state listed as threatened or endangered, and four are nonlisted special-status species.

San Francisco to Santa Clara

The project route lies entirely within the California Floristic Province of northern California and the San Francisco Bay physiogragraphic province. The route begins in Daly City and runs east through an existing Pacific Bell duct to San Francisco. From San Francisco, the project route continues south along city streets to Brisbane, where it enters and continues south in an idle pipeline to San Bruno. In San Bruno, the project route again continues south along city streets to El Camino Real, where it continues southeast to Santa Clara. Most of the project route is urbanized, consisting of non-native or ornamental vegetation. In these areas, the project route will be plowed or trenched in road shoulders or bored beneath pavement. In the sections between Daly City and San Francisco and Brisbane to San Bruno, the cable will be installed within existing pipelines, requiring occasional access points. A small portion of the project route between Brisbane and San Bruno crosses the southeastern extreme of San Bruno Mountain, an area consisting mostly of annual grasslands.

Portions of the route also are near San Francisco Bay, although salt marsh and other habitats associated with the edge of the bay are not expected to be affected by the project.

Vegetation and Wildlife. Survey methods used to identify vegetation and wildlife resources along this route were described previously in this section.

Common Plant Communities and Associated Wildlife Habitat

Ruderal Habitats. Ruderal habitats are common in the proposed project study area and are primarily associated with the edges of roads and other developed areas. Refer to the Sacramento to the California/Nevada border route for a discussion of this plant community and its wildlife associations.

Urban Landscaping. Urban lands are present adjacent to much of the proposed route. Vegetation in urban areas consists of ornamental trees and shrubs, lawns, and flowerbeds.

Annual Grassland. Annual grassland is found along the portion of the route between Brisbane and San Bruno, at the southeast extreme of San Bruno Mountain. Refer to the Point Arena to Sacramento project section for a discussion of this plant community and its wildlife associations.

Sensitive Plant Communities and Associated Wildlife Habitat

Mixed Willow Riparian Forest and Woodland. This riparian forest community is located along San Mateo Creek . Less significant stands of riparian forest and woodland are located along other perennial creeks that cross the project route. Refer to the Sacramento to the California/Nevada border route for a discussion of this plant community and its wildlife associations.

Emergent Marsh. Emergent marsh is a wetland plant community found along the banks of perennial drainages that cross the study area. However, this community is uncommon along the project route because most of the drainages are channelized and cement lined. Refer to the Point Arena to Sacramento route for a discussion of this plant community and its wildlife associations.

Fish. Fish are present in several of the perennial drainages that cross the project route. All of these drainages are on the east slope of the peninsula and empty into San Francisco Bay. Special-status fish species that occupy the bay could also inhabit at least the lower reaches of these drainages. However, the overall quality of fish habitat in the drainages crossed by this project route is low because of channelization, seasonality of flow, and the urban setting.

Threatened, Endangered, Candidate, and Other Special-Status Species

Threatened, Endangered, Candidate, and Other Special-Status Plants. A total of 37 special-status plant species have the potential to occur in the proposed project study area (**Appendix K-1**). Of these, 10 species are federally listed as threatened or endangered, 10 are state listed as threatened or endangered, and 26 are nonlisted special-status species. Surveys along this route are complete. No special-status plants were located during the early season surveys.

Threatened, Endangered, Candidate, and Other Special-Status Wildlife. The following special-status wildlife species or habitat for these species were located along the proposed project route:

- California red-legged frog and western pond turtle. Six streams that cross the project route were identified as having potential to support California red-legged frog and western pond turtle.

- Callippe silverspot butterfly and Mission blue butterfly. Potential exists for these species to occur on the southeastern edge of San Bruno Mountain, where the project route crosses in an existing pipeline.

Appendix K-4 provides status, distribution, and habitat requirements of all potentially-occurring special-status species, and the wildlife resource tables in **Appendix G** provide the locations of special-status species or habitat along the project route.

Threatened, Endangered, Candidate, and Other Special-Status Fish. One federally listed as threatened fish species (steelhead) has the potential to occur in the proposed project study area (**Appendix K-5**).

Pittsburg to Sacramento

The project route lies entirely within the California Floristic Province of northern California. The proposed project study area encompasses two major physiogeographic provinces, the San Francisco Bay and California's Great Central Valley. From downtown Sacramento, the route extends west through developed urban and industrial areas across the Sacramento River, and then west along the Southern Pacific Railroad (SPRR) right-of-way towards the City of Davis. Major plant communities and habitat associations along this section include developed urban and industrial areas, disturbed ruderal habitat, agricultural areas, and scattered emergent marsh, and seasonal wetlands. Major drainages crossed by the project route in this area include the Sacramento River and Putah Creek. Other smaller drainages and ditches are also crossed.

From the vicinity of Davis, the project route extends south, follows various county road rights-of-way and SR 113 and eventually crosses SR 12 north of the Montezuma Hills. The main biological communities present along this segment include agricultural land, annual grassland, occasional seasonal wetlands, and pockets of emergent marsh and riparian scrub that are associated with the margins of ditches, natural drainages and the open water areas of several sloughs. This project route continues along county road rights-of-way as it crosses south over the Montezuma Hills to the north bank of the Sacramento River along Toland Lane. The Montezuma Hills consist primarily of annual grasslands and cultivated grain crops.

The Sacramento River will be crossed by directional bore. South of the Sacramento River, the project route extends across Sherman Island along the PG&E utility right-of-way. It then follows the right-of-way of SR 160 and crosses the San Joaquin River on the Antioch Bridge. South of the Antioch Bridge, the project route once again extends south along the PG&E utility right-of-way and then heads east along the SPRR right-of-way to the vicinity of Pittsburg. The major biological communities along this segment include developed areas, agricultural areas, ruderal habitats, occasional seasonal wetlands, and pockets of emergent marsh and riparian scrub that are associated with the margins of ditches, and the open water areas of the Sacramento and San Joaquin rivers.

Vegetation and Wildlife. Survey methods used to identify vegetation and wildlife resources along this route were described previously in this section.

Common Plant Communities and Associated Wildlife Habitat

Ruderal Habitats. Ruderal habitats are common throughout the proposed project study area and are associated with the margins of agricultural areas, the edges of roads, the railroad right-of-way, and other developed areas. Refer to the Sacramento to California/Nevada border route for a discussion of this plant community and its wildlife associations.

Agricultural Lands. Agricultural lands are the dominant biological community in the proposed project study area. Agricultural areas include row crops, dry-farmed winter wheat, irrigated pasture, and one vineyard in the vicinity of Antioch. Ruderal habitats are present around the edges of the fields. Agricultural habitats in the Sacramento-San Joaquin Delta and in the Sacramento Valley are important for wintering waterfowl populations; provide foraging habitat for raptor species, including the state-threatened Swainson's hawk; and function as both breeding and foraging habitat for many other birds and small mammals.

Annual Grassland. Annual grassland exists in the proposed project study area near SR 113 and in other scattered pockets north of SR 12. Annual grasslands along the project route typically consists of small patches of undeveloped or uncultivated land or narrow strips along roadsides. Therefore, they generally provide similar value to wildlife as ruderal and some agricultural habitats. Refer to the Point Arena to Sacramento route for a discussion of this plant community and its wildlife associations.

Sensitive Plant Communities and Associated Wildlife Habitat

Emergent Marsh. The emergent marsh plant community is found scattered throughout the project study area where it is associated with the edges of canals, irrigation ditches, sloughs, occasional perennial drainages and riverbanks. Refer to the Point Arena to Sacramento route for a description of this plant community and associated wildlife species.

Some of the canals and ditches along the SR 113 portion of the project route support potential habitat for the federally listed Delta green ground beetle. Emergent marsh is considered a sensitive community because it may support several state- and federally listed species and because of the historic and continuing loss of wetlands from agricultural conversion, urbanization, and flood control development.

Riparian Scrub. Riparian scrub communities are associated with the South Fork of Putah Creek, the margins of sloughs, and along several drainages in the proposed project study area. Riparian scrub is dominated by a mixture of shrubby willows, with occasional Fremont's cottonwood, ash, and young valley oak. Himalayan blackberry and poison oak are sometimes also included. When present, herbaceous species include some of those already mentioned for the seasonal wetland, emergent marsh, and ruderal plant communities.

These sites provide habitat for various waterbirds and amphibians and provide a source of water for many wildlife species. Riparian scrub also functions as foraging and breeding habitat for a variety of wildlife. Species that typically occupy this habitat in the Sacramento Valley include bullfrogs, black-crowned night-herons, green-backed herons, great blue herons, belted kingfishers, wood ducks, river otter, mink, and beaver.

Riparian scrub is considered a sensitive community because of the historic and continuing loss of riparian vegetation from agricultural conversion, urbanization, and flood control development.

Seasonal Wetland. Seasonal wetlands were identified throughout the proposed project study area and are associated principally with disturbed roadside depressions, the edges of seasonal drainages, and with groundwater seeps. Some of the seasonal wetlands encountered are dominated by perennial species including cattail, tule, and false sedge. The drier margins support mostly annual species including annual rabbitsfoot grass, Italian ryegrass, Curly dock, cocklebur, Mediterranean barley, bristly oxtongue, and hyssop loosestrife. Some seasonal wetlands only support the annual species mentioned above.

Seasonal wetlands provide foraging and breeding habitat for a variety of common and rare wildlife species. Amphibians, including western toads and Pacific chorus frogs forage and breed in these habitats. Insect larvae and other aquatic invertebrates serve as food for developing amphibian larvae and for the many birds that overwinter in or migrate through the Central Valley. One seasonal wetland is located near the project route that provides potential habitat for federally listed freshwater invertebrates, including the Delta green ground beetle, vernal pool fairy shrimp, and vernal pool tadpole shrimp. The proximity of the wetland habitats to existing roads along the proposed project route reduces the value of this habitat for birds and other animals because of disturbance from vehicle traffic.

Fish. The proposed project will lie entirely within the San Joaquin and Sacramento river watersheds. The San Joaquin and Sacramento rivers and the connected sloughs support a number of fish species including all four runs of Central Valley chinook salmon (comprising the Central Valley fall-/late fall- and spring-run, and Sacramento River winter run chinook salmon ESUs), Central Valley ESU steelhead, delta and longfin smelt, Sacramento splittail, roach, green and white sturgeon, Pacific and river lampreys, hardhead, longjawed mudsucker, American and threadfin shad, rainbow trout, Sacramento squawfish, Sacramento perch, tule perch, Sacramento blackfish, Pacific herring, stickleback, sculpins, bass and roach. Putah Creek supports several warmwater fishes such as largemouth bass, green sunfish, Sacramento blackfish, hitch, carp, black bullhead, white crappie and catfish. Occasionally, during wet years, anadromous fish can migrate upstream to stream reaches near Davis.

Threatened, Endangered, Candidate, and Other Special-Status Species

Threatened, Endangered, Candidate, and Other Special-Status Plants. A total of 28 special-status plant species have the potential to occur in the project study area (**Appendix K-3**). Of these, four species are federally listed as threatened or endangered, four are state listed as threatened or endangered, and 24 are nonlisted special-status species. Botanical surveys along the Sacramento to Pittsburg route are complete. The following three special-status plants were located during 1999 field surveys:

- Delta tule pea, a CNPS List 1B species. Two occurrences of this species were located in the proposed project study area and can be found on the Jersey Island quadrangle.

- Mason's lilaeopsis, a state-listed as rare and a CNPS List 1B species. Six occurrences of this species were located in the proposed project study area and can be found on the Jersey Island quadrangle.

- Delta mudwort, a CNPS List 2 species. Three occurrences of this species were located in the proposed project study area and can be found on the Jersey Island quadrangle.

Threatened, Endangered, Candidate, and Other Special-Status Wildlife. A total of 56 special-status wildlife species have the potential to occur in the proposed project study area (**Appenidx K-4**). Of these, 13 species are federally listed as threatened or endangered, nine are state listed as threatened or endangered, and 41 are nonlisted special-status species. The following special-status wildlife species or habitat for these species were located along the project route:

- Swainson's hawk. Several active nests were located on or near the project route in the Central Valley portion of the proposed project study area.

- Valley elderberry longhorn beetle. Numerous elderberry shrubs, the host plant for VELB, were located along the project route in the Central Valley and Sacramento-San Joaquin River Delta.

- Giant garter snake. Several perennial drainages were located along the Central Valley portion of the project route that potentially support giant garter snake.

- Burrowing owl. One active burrowing owl nest was found along the project route southeast of Dixon.

- Delta green ground beetle. Several locations occupied or potentially occupied by the Delta green ground beetle were located during surveys near Jepson Prairie.

- Vernal pool fairy shrimp and vernal pool tadpole shrimp. Several vernal pools and swales were located in the vicinity of Jepson Prairie that could potentially support these species.

Appendix K-4 provides the status, distribution, and habitat requirements of all potentially-occurring special-status species, and the wildlife resource tables in **Appendix G** provides the locations of special-status species or habitat along the project route.

Threatened, Endangered, Candidate, and Other Special-Status Fish. A total of 15 special-status fish species have the potential to occur in the project study area (**Appendix K-5**). Of these, four species are federally listed as threatened or endangered, three are state listed as threatened or endangered, and eight are nonlisted special-status species.

San Luis Obispo to Bakersfield

The project study area lies entirely within the California Floristic Province. It crosses two major physiographic provinces, the southern Coast Range and the San Joaquin Valley. The proposed route begins at San Luis Obispo and proceeds north along the existing Pacific Bell right-of-way parallel to U.S. Highway 101, across Cuesta Pass in the Santa Lucia Range, then crosses over to the UPRR right-of-way to Santa Margarita. The main plant communities/habitat associations along this section include blue oak woodland, coastal sage scrub, and coast live oak forest.

From Santa Margarita, the project route continues north along the UPRR right-of-way to the town of Atascadero. The main habitats along this section include California annual grassland, blue oak woodland, and ruderal habitat. From Atascadero, the route travels northeast via an idle Chevron 10-inch pipeline across the Temblor Range and descends into the Bitterwater Valley, crossing coast live oak forest, California annual grassland, and blue oak woodland. From the Bitterwater Valley, the project route travels southeast along the western edge of the San Joaquin Valley to the Belridge Plain, turning east at the California Aqueduct. The main plant communities/habitat associations in this section are California annual grassland and Great Valley

spinescale scrub. East of the California Aqueduct, the cable will connect to a regenerator station then continue in the pipeline to its intersection within county roads and the UPRR right-of-way. The project route will then follow railroad and road rights-of-way to its terminus in Bakersfield. East of the California Aqueduct, the habitats are primarily agricultural or ruderal. The project route crosses seasonal drainages at many locations west of the California Aqueduct and irrigation canals at many locations east of the aqueduct. Ruderal habitat is present along roadsides and in other disturbed areas, such as in the Belridge oil fields.

Vegetation and Wildlife

Common Plant Communities and Associated Wildlife Habitat

Agricultural Lands. Agricultural lands are the dominant habitat type in the area between the California Aqueduct and the project route terminus in Bakersfield. They are also scattered along the route west of the aqueduct to Atascadero. Types of agricultural lands in the project area include cropland, orchard/vineyard, and pasture. Row crops, alfalfa, grains, and cotton are typically planted in this area.

Agricultural habitats have varying benefits to wildlife. The lack of adjacent native habitats and intensive management of agricultural lands, including disking, grazing, crop rotation, and the use of chemicals, reduces the value of agricultural lands for wildlife. However, many wildlife species have adapted to particular crop types and now use them for foraging and nesting. Raptor species use row and grain crops for foraging, and several species of common rodents are found in agricultural fields. Agricultural habitats also provide foraging and resting habitat for migrating and wintering raptors, waterfowl, and shorebirds. Compared to other agricultural crops, grain crops are considered of high value for wildlife because of the importance of waste grain to foraging waterfowl. Compared to grains, row crops provide moderate-quality habitat because of limited cover and foraging opportunities. Orchard-vineyard and cotton crops provide low-quality wildlife habitat because of limited foraging opportunities and because of difficulty accessing the ground surface where prey occur.

Ruderal Habitat. Some areas along the route have been subject to frequent disturbance, such as ranching and staging areas, roadsides, and feedlots. The project route passes through several areas of ruderal habitat along the UPRR to the route terminus in Bakersfield. Ruderal habitat also exists at scattered locations along the rest of the route. Refer to the Sacramento to California/Nevada border route for a discussion of this plant community and its associated wildlife.

Annual Grassland. Annual grassland exists in numerous location along the project route. Refer to Point Arena to Sacramento route for a discussion of this plant community and its wildlife associations.

California Sagebrush Scrub. California sagebrush scrub is a plant community dominated primarily by low- to moderate-sized shrubs, often associated with adjacent chaparral or grassland habitats. It is found on steep slopes in the canyons between San Luis Obispo and Santa Margarita. The characteristic species is California sage, but other dominant shrub species include California buckwheat, black sage, interior goldenbush, and deerweed. The understory is typically composed of low herbaceous annuals.

Plants associated with California sagebrush scrub provide berries and seeds for a variety of birds, such as California quails, northern mockingbirds, American robins, hermit thrushes, spotted towhees, California towhees, dark-eyed juncos, and golden crowned sparrows. Insectivorous birds, such as orange-crowned warblers, bushtits, and Bewick's wrens, feed on insects in shrub foliage. Many bird species also find nesting and roosting sites and protection from predators in this habitat. Numerous rodents also inhabit California

sagebrush scrub habitats, as well as deer, rabbits, hares, gray foxes, coyotes, western fence lizards, western rattlesnakes, and gopher snakes.

Blue Oak Woodland. Blue oak woodland is a common plant community along the project route between Santa Margarita and the Palo Prieto Valley in the Temblor Range. Refer to the Point Arena to Sacramento route for a discussion of this plant community and its associated wildlife.

Sensitive Plant Communities and Associated Wildlife Habitat

Coast Live Oak Forest. Coast live oak forest exists along the narrow canyon of San Luis Obispo Creek where the project route parallels U.S. Highway 101 and in the foothills immediately east of Atascadero. The dominant trees are California bay and coast live oak. Other tree species include Fremont cottonwood, red willow, and western sycamore. Dominant understory shrubs include California coffeeberry and poison oak. Along the project route, coast live oak forest within riparian zones is subject to DFG jurisdiction under Section 1600 et seq. of the Fish and Game Code. Portions of this plant community may also include wetlands subject to Corps jurisdiction under Section 404 of the Clean Water Act. Wildlife associated with the coast live oak forest will be similar to those described previously for various oak woodlands under other project routes.

Great Valley Spinescale Scrub. Great Valley spinescale scrub exists on the Belridge Plain between the Belridge oilfield and the California Aqueduct. This plant community is found on alkali soils and is dominated by spiny saltbush. Other alkali- or salt-tolerant perennials are common, including fourwing saltbush, bush seepweed, alkali heath, and recurved larkspur. The understory consists of grasses and forbs, including red brome, foxtail barley, common spikeweed, and slender-stemmed buckwheat.

Wildlife use of Great Valley spinescale scrub is generally similar to that of annual grassland. Depending on the density of shrubs, this habitat type supports various wildlife species, including several special-status species such as Le Contes thrashers, giant and Tipton kangaroo rats, San Joaquin kit foxes, blunt-nosed leopard lizards, and San Joaquin antelope ground squirrels.

Great Valley spinescale scrub is considered a sensitive plant community in the Central Valley because it has become uncommon through agricultural conversion, flood control, and groundwater pumping (Holland 1986).

Valley Oak Woodland. Valley oak woodland exists primarily in the valley bottoms and along drainages in the valleys between Santa Margarita and the Palo Prieto Valley in the Temblor Range. Refer to the Point Arena to Sacramento route for a discussion of this plant community and its wildlife associations.

Southern Cottonwood-Willow Riparian Forest. Southern cottonwood-willow riparian forest exists along Santa Margarita Creek, the Salinas River, and the Kern River. This plant community has a low to medium canopy cover of trees and shrubs. The dominant trees are Fremont cottonwood and red willow, but other tree species are also present, including western sycamore and coast live oak. Dominant understory shrubs include arroyo willow, sandbar willow, and mulefat. Blue elderberry may also be present. The herbaceous understory is composed of typical riparian species, such as mugwort and poison hemlock. On floodplains subject to scouring during high flows, a sparse cover of ruderal species is present.

Despite widespread disturbances from urbanization, agricultural conversion, and grazing, riparian forest remains an important wildlife resource because of its scarcity regionally and statewide and because the riparian community is used by a variety of wildlife species. This habitat produces abundant aquatic and terrestrial

invertebrates that are prey for amphibians and reptiles, such as common garter snakes, western skinks, and ringneck snakes, as well as insectivorous birds, such as warblers, northern flickers, downy woodpeckers, and flycatchers. Small mammals found in riparian habitats include shrews, voles, bats, and mice. Raptors that nest in large riparian trees include great-horned owls, red-tailed hawks, and American kestrels. Cavity-nesting species, such as woodpeckers, bats, squirrels, and raccoons, require mature stands of trees. Striped skunks, red foxes, gray foxes, and badgers forage in riparian habitats and use them for cover and travel.

Southern cottonwood-willow riparian forest is considered a sensitive plant community subject to DFG jurisdiction under Section 1600 et seq. of the Fish and Game Code.

Emergent Marsh. Emergent marsh is present in the Kern Water Bank, adjacent to the project route on both sides of Interstate 5, and adjacent to seasonal drainages. Refer to the Point Arena to Sacramento route for a description of this vegetation community and its wildlife associations.

Seasonal Wetlands. Few wetlands are located along the project route. Most are associated with seasonal drainages that have sandy to gravelly bottoms and generally lack perennial or wetland vegetation. Vegetation on stream banks is similar to that of the adjacent plant community, but because of frequent disturbance by stream flows, ruderal species are often present. Refer to the Point Arena to Sacramento route for a description of this vegetation community and its wildlife associations.

Fish. From San Luis Obispo to Atascadero, the project route will originate in the San Luis Obispo Creek watershed and follow U.S. Highway 101 north across the Santa Lucia range to the Salinas River watershed and Santa Margarita Creek basin. The project route will then continue up the UPRR right-of-way in the Salinas River watershed to its connection with the idle 10-inch Chevron pipeline in Atascadero. Fish present in the San Luis Obispo Creek drainage near this route include South Central ESU steelhead, rainbow trout, dace, sculpin and Pacific lamprey. The tidewater goby could also be present nearer the mouth of San Luis Obispo Creek. The mainstem Salinas River and Santa Margarita and Trout creeks provide habitat for South Central ESU steelhead, Monterey roach, rainbow trout speckled dace, threespine stickleback and sculpin.

From Atascadero, the project route crosses the Salinas River drainage (including the mainstem) and continues northeast in the pipeline corridor through intermittent headwater streams in the Estrella River drainage just south of Cholame. The project route will then turn southeast and proceed though the Bitterwater drainage, across Antelope Plain, parallel to, then crossing the California Aqueduct south of Buttonwillow, and crossing several canals. Streams in the Salinas River drainage near the crossings support South Central California ESU steelhead, rainbow trout, Monterey roach, Pacific lamprey, dace, and sculpin. Headwater stream of the Estrella River drainage and Bitterwater Creek crossed by this portion of the project route provide limited fish habitat because of their intermittent nature. The reach of the Kern River crossed by this project route provides habitat for several warmwater species, including various cyprinids (minnow family) and centrarchids (sunfishes). The canals likely contain fishes similar to those found in the Kern River.

Threatened, Endangered, Candidate, and Other Special-Status Species

Threatened, Endangered, Candidate, and Other Special-Status Plants. A total of 45 special-status plant species have the potential to occur in the proposed project study area (**Appendix K-3**). Of these, six species are federally listed as threatened or endangered, four are state listed as threatened or endangered, and 37 are nonlisted special-status species. Botanical surveys along the San Luis Obispo to Bakersfield route are complete. The first surveys along the route were conducted too early because of property access constraints. Therefore, a habitat assessment was performed to determine what species could occur along the project route.

Areas that could provide habitat for early blooming special-status plants were mapped and characterized for avoidance during construction activities. As a result of this habitat assessment and subsequent surveys for later blooming species, the following two special-status plants and habitat for an additional four species were located during 1999 field surveys:

- San Luis mariposa lily, a CNPS List 1B species. One occurrence of this species was located along the Pac Bell route in San Luis Obispo, northwest of Cuesta Park and can be found on the San Luis Obispo quadrangle.

- Hoover's eriastrum, a federally listed threatened and CNPS List 4 species. One occurrence of this species was located in the proposed project study area and can be found on the West Elk Hills quadrangle.

- Dwarf calycadenia, a USFS sensitive and CNPS List 1B species. Scattered areas of suitable habitat for this species were located between Creston on the Creston quadrangle and east end of Palo Prieto Canyon on the Holland quadrangle.

- Hall's tarplant, a CNPS List 1B species. Scattered areas of suitable habitat for this species was located between Creston on the Creston quadrangle and east end of Palo Prieto Canyon on the Holland quadrangle.

- Pale-yellow layia, a USFS sensitive and CNPS List 1B species. Scattered areas of suitable habitat for this species were located between Creston on the Creston quadrangle and east end of Palo Prieto Canyon on the Holland quadrangle.

- Showy madia, a CNPS List 1B species. Scattered areas of suitable habitat for this species was located between Creston on the Creston quadrangle and east end of Palo Prieto Canyon on the Holland quadrangle.

Threatened, Endangered, Candidate, and Other Special-Status Wildlife. A total of 60 special-status wildlife species have the potential to occur in the project study area (**Appendix K-4**). Of these, 12 species are federally listed as threatened or endangered, eight are state listed as threatened or endangered, and 43 are nonlisted special-status species. The following special-status wildlife species or habitat for these species were located along the project route:

- San Joaquin kit fox, blunt-nosed leopard lizard, giant kangaroo rat, Tipton's kangaroo rat, and San Joaquin Antelope ground squirrel. Habitat for these species was found throughout much of the southern San Joaquin Valley portion of the proposed project study area.

- Southwestern willow flycatcher and least Bell's vireo. The project route crosses several drainages with willow-cottonwood riparian forest between San Luis Obispo and the Central Valley, potentially supporting southwestern willow flycatcher and least Bell's vireo.

- California red-legged frog and foothill yellow-legged frog. The project route crosses several drainages in the Coast Ranges portion of the proposed project study area identified as having potential to support the California red-legged frog and foothill yellow-legged frog.

- Golden eagle. One active golden eagle nest was located near the project route in the Coast Ranges portion of the project route.

Appendix K-4 provides the status, distribution, and habitat requirements of all potentially occurring special-status species, and the wildlife resource tables in **Appendix G** provide for locations of special-status species or habitat along the project route.

Threatened, Endangered, Candidate, and Other Special-Status Fish. A total of four special-status fish species have the potential to occur in the proposed project study area (**Appendix K-5**). Of these, two species are federally listed as threatened or endangered and two are nonlisted special-status species.

San Luis Obispo to Los Osos Loop

The San Luis Obispo to Los Osos Loop route begins in San Luis Obispo and proceeds west along two distinct road rights-of-way. One route proceeds north within an existing conduit along city streets to Foothill Boulevard, then west to Los Osos Valley Road. This route crosses San Luis Obispo Creek in downtown San Luis Obispo. The second route proceeds west within city street rights-of-way, crossing San Luis Obispo Creek at the bridge spanning Prado Road. This route turns south on Madonna Road to Los Osos Valley Road. The two routes proceed west along opposite sides of Los Osos Valley Road, within the road right-of-way, to the AT&T China-U.S. cable landing in Los Osos.

The habitat within the road rights-of-way is generally disturbed, often being disked or scraped. Vegetation is often absent or consists of ruderal species. When vegetation is present, it is a mixture of ruderal species and species from the adjacent habitats. Habitats adjacent to the northern project route are almost entirely urban from Grande Drive to Foothill Boulevard and along the first mile of Foothill Boulevard. Habitat along the southern project route is also urban from Grande Drive to the west side of U.S. Highway 101. Habitats adjacent to Los Osos Valley Road include annual grassland, coast live oak forest, agricultural land, and urban land.

Willow scrub riparian habitat is present along the drainages that the project route crosses, including San Luis Obispo Creek along the southern route and Stenner Creek along the northern route. The project route also crosses Los Osos Creek at Los Osos Valley Road and several seasonal drainages, a few of which support mixed willow scrub riparian habitat.

Vegetation and Wildlife

Common Plant Communities and Associated Wildlife Habitat

Annual Grassland. Annual grassland exists adjacent to the project route along Foothill Boulevard and Los Osos Valley Road. Refer to the Point Arena to Sacramento route for a discussion of this plant community and its wildlife associations.

Agricultural Lands. Agricultural lands exist adjacent to the project route along Los Osos Valley Road. Refer to the San Luis Obispo to Bakersfield route for a discussion of this plant community and its wildlife associations.

Urban Landscaping. Urban lands exist along the project route adjacent to the right-of-way within the San Luis Obispo urban area, along Los Osos Valley Road, and within the town of Los Osos. Vegetation in urban areas consists of ornamental trees and shrubs, lawns, and flower beds.

Ruderal Habitat. Ruderal habitat exists along the entire length of the project route. Ruderal habitats are associated with the margins of agricultural areas, the edges of roads, and other developed areas. Refer to the San Luis Obispo to Bakersfield route for a discussion of this plant community and its wildlife associations.

Sensitive Plant Communities and Associated Wildlife Habitat

Coast Live Oak Forest. Coast live oak forest exists along the south side of Los Osos Valley Road along a small, 0.25-mile stretch near the Los Osos Oaks State Preserve. At Los Osos, the coast live oaks, because of their proximity to the Pacific Ocean, are exposed to the combined stresses of strong winds; salt spray; and sterile, sandy soils. These environmental factors create an oak forest characterized by short, wind-pruned trees. The coast live oak forest community has an understory of scattered shrubs, including coyote brush, and annual grasses and forbs. Lichens are prominent on the bark and branches. Coast live oak forest is a locally sensitive plant community; the nearby Elfin Forest Ecological Preserve in Baywood Park was established to protect an example of this plant community.

Southern Willow Scrub. Southern willow scrub exists within the floodplain of San Luis, Stenner, Prefuma, Sycamore Canyon, and Los Osos creeks. The dominant species are red willow and arroyo willow. Southern willow scrub is similar to southern cottonwood-willow riparian forest except for the absence of large tree species.

Southern willow scrub provides a variety of benefits for many species of wildlife, including over 50 species of reptiles and amphibians. Insect abundance is typically high, providing forage for many neotropical migratory birds. The dense cover of willow scrub provides nesting, thermal, and escape cover, and such habitats are often used as migration corridors.

Seasonal Wetlands. A small wetland with ponded water is located on both sides of Foothill Road approximately 0.25 mile north of the junction with Los Osos Valley Road, and freshwater marsh is located along the borders of Laguna Lake adjacent to Madonna Road. These wetlands fall under the general category of seasonal wetlands. Refer to the Point Arena to Sacramento route for a discussion of this plant community and its wildlife associations.

Fish. Fish present in the San Luis Obispo and Los Osos creek drainages include South Central California ESU steelhead, rainbow trout, dace, sculpin, and Pacific lamprey. The tidewater goby may also be present in the lower reaches of San Luis Obispo Creek below the proposed project study area.

Threatened, Endangered, Candidate, and Other Special-Status Species

Threatened, Endangered, Candidate, and Other Special-Status Plants. A total of 36 special-status plant species have the potential to occur in the proposed project study area (**Appendix K-3**). Of these, six species are federally listed as threatened or endangered, four are state listed as threatened or endangered, and 29 are nonlisted special-status species. Surveys along the San Luis Obispo to Los Osos Loop are complete. No special-status plants have been previously recorded or were located during the 1999 field surveys.

Threatened, Endangered, Candidate, and Other Special-Status Wildlife. A total of 52 special-status wildlife species have the potential to occur in the proposed project study area (**Appendix K-4**). Of these, 10 are federally listed as threatened or endangered, five are state listed as threatened or endangered, and 39 are nonlisted special-status species. The following special-status wildlife species or habitat for these species were located along the project route:

- Morro shoulderband snail. Surveys for Morro shoulderband snail were conducted, and occupied and potential habitat was identified along the project route.

- Morro kangaroo rat. Potential habitat for the Morro kangaroo rat was identified along the project route.

- California red-legged frog. The project route crosses several drainages identified as having potential to support the California red-legged frog.

Appendix K-4 provides the status, distribution, and habitat requirements of all potentially occurring special-status species, and the wildlife resource tables in **Appendix G** provide locations of special-status species or habitat along the project route.

Threatened, Endangered, Candidate, and Other Special-Status Fish. A total of three special-status fish species have the potential to occur in the proposed project study area (**Appendix K-5**). Of these, two are federally listed as threatened or endangered (tidewater goby, South-Central California Coast ESU steelhead), and one is nonlisted special-status species (Pacific lamprey).

Riverside to California/Arizona Border

The project route originates in the Southwest Region of the California Floristic Province and crosses into the Sonoran Desert Region of the Desert Floristic Province. Within the Southwest Region, the project route crosses portions of the South Coast and Peninsular Range subregions. Because the route parallels the UPRR for long distances, much of the project route is within the railroad right-of-way and is highly disturbed. In other areas, the route crosses open country and is less disturbed.

The project route originates in Riverside in an urban area. The project route crosses the Santa Ana River and enters San Timoteo Canyon. Possible habitats in this area include ruderal habitat, annual grassland, chamise chaparral, Riversidean sage scrub, and riparian scrub. East of San Timoteo Canyon, the project route crosses through the Badlands, a small range of hills, and the San Gorgonio Pass, then parallels the San Gorgonio River. The project route eventually crosses the San Gorgonio River and the Whitewater River, then enters the Coachella Valley near Palm Springs. Habitats in this area include annual grassland, Riversidean sage scrub, ruderal habitat, and urban lands.

In the Coachella Valley, the project route parallels the railroad right-of-way, and the habitat is mainly ruderal. Adjacent habitats are primarily urban and agricultural lands and areas of Sonoran Desert scrub. South of the Coachella Valley, the project route continues to parallel the railroad right-of-way along the east side of the Salton Sea. The project route leaves the railroad right-of way for approximately 9 miles and later crosses a series of bajadas that originate on the west slopes of the Mecca Hills, the Orocopia Mountains, and the Chocolate Mountains. The primary habitat in this area is Sonoran Desert scrub, although this is largely disturbed within the railroad right-of-way.

The project route eventually crosses the northern end of the Imperial Valley near Niland. In this area, the adjacent habitats are agricultural lands, urban lands, and Sonoran Desert scrub. East of Niland, the project route continues along the railroad right-of-way through desert lands to Yuma. The habitat along the right-of-way is highly disturbed. The adjacent habitat is primarily Sonoran Desert scrub. Continuing east, the route crosses a series of desert washes with desert dry wash woodland in some areas. Near Yuma, the project route enters the Yuma Valley. In the valley, east of the All American Canal, the adjacent habitat is agricultural land.

Vegetation and Wildlife

Common Plant Communities and Associated Wildlife Habitat

Urban Landscaping. The route passes through urban lands primarily near its start in Riverside and in the northern end of the Coachella Valley between Beaumont and Indio. Vegetation in urban areas consists of ornamental trees and shrubs, lawns, and flowerbeds.

Ruderal Habitat. Ruderal habitat is located at many locations along the entire length of the route, primarily where the route is within the railroad right-of-way. Refer to the San Luis Obispo to Bakersfield route for a discussion of this plant community and its wildlife associations.

Annual Grassland. Annual grassland exists along the route primarily between Riverside and San Gorgonio Pass. Refer to the Point Arena to Sacramento route for a discussion of this plant community and its wildlife associations.

Agricultural Lands. Agricultural lands exist primarily in the Coachella Valley but also at the north end of the Imperial Valley and in the Yuma Valley on the east side of the Colorado River. Refer to the San Luis Obispo to Bakersfield route for a discussion of this habitat and its wildlife associations.

Chamise Chaparral. Chamise chaparral occurs on slopes and ridges between Riverside and San Gorgonio Pass. Refer to the Point Arena to Sacramento route for a discussion of this plant community and its wildlife associations.

Riversidean Sage Scrub. Riversidean sage scrub is a common plant community along the coastal base of the Peninsular Ranges (Holland 1986). This plant community typically is found on dry slopes. The dominant species are California sage and California buckwheat, and common species include brittlebush and matchweed. The understory generally consists of annual grassland species, often dominated by red brome.

Wildlife species associated with Riversidian sage scrub are similar to those described for California sagebrush scrub. Refer to the San Luis Obispo to Bakersfield route for a discussion of wildlife associated with this plant community.

Sonoran Desert Scrub. Sonoran desert scrub is the dominant plant community in the Sonoran Desert of California (Holland 1986). This plant community exists on slopes, fans, and valleys and is characterized by widely spaced shrubs with a sparse herbaceous understory. The dominant shrub species include creosote bush and burroweed. Other common plants include ocotillo, brittlebush, and several cactus species. The annual herbaceous understory is sparse and often composed of non-natives, including red-stemmed filaree, Arabian grass, woolly plantain, and Asian mustard.

Wildlife associated with Sonoran desert scrub is dominated by reptiles and small mammals, with several bird species also being common. Wildlife species typically found in desert scrub habitats include desert tortoise, antelope ground squirrel, a variety of snakes and lizards, black-throated sparrow, black-tailed gnatcatcher, kit fox, coyotes, and numerous pocket mice and kangaroo rats.

Sensitive Plant Communities and Associated Wildlife Habitat

Mixed Willow Scrub. Mixed willow scrub occurs along drainages between Riverside and San Gorgonio Pass. Refer to the San Luis Obispo to Los Osos Loop route for a discussion of this plant community and its wildlife associations.

Desert Dry Wash Woodland. Desert dry wash woodland is an open to dense, drought-deciduous, riparian woodland located along sandy or gravelly washes and arroyos of the lower Mojave and Sonoran deserts (Holland 1986). This habitat is also known as microphyll woodland because the dominant species are typically thorny, small-leaved trees and shrubs in the legume family (Fabaceae).

Desert dry wash woodland is most likely to be found along the project route between Niland and Yuma. The dominant plant species are blue palo verde, ironwood, and smoke tree. Other typical wash species found in this habitat include cat-claw acacia, desert lavender, narrow-leaved thornbush, and burrobrush. Other Sonoran Desert scrub species commonly exist in the dry wash woodland.

Desert dry wash woodlands support more bird species at higher densities than any other desert habitat except riparian. The higher density of shrubs relative to adjacent habitats provides food and cover for a variety of wildlife species and nesting sites for ash-throated flycatchers, phainopepla, Gambel's quail, and various other bird species.

Desert dry wash woodland is regulated by the Corps as waters of the United States. Although desert washes generally convey flows only during periods of precipitation, the Corps considers them to be ephemeral tributaries, a type of isolated water.

Fish. This project route originates in the Santa Ana River watershed. The project route continues east up the Timoteo Creek canyon (a tributary of the Santa Ana River), crossing the headwaters of Potrero Creek (tributary to the San Jacienta River), and entering the San Gorgonio River watershed between the towns of Beaumont and Banning. Continuing east, the project route crosses San Gorgonio Pass and enters the Whitewater River watershed, which is a tributary to the Salton Sea, then southeast to the town of Mecca on the north shore of the Salton Sea. From Mecca, the project route will parallel the eastern shore of Salton Sea, crossing numerous small tributaries to the sea, then continue southeast from the town of Niland, crossing the All American Canal approximately 2 miles north of Andrade to its terminus at the California/Arizona border in the lower Colorado River watershed.

The Santa Ana River watershed provides habitat for several sensitive fish species, including the Arroyo chub, Santa Ana sucker, and Santa Ana speckled dace. However, fish habitat in the reaches of this watershed crossed by this route is very limited because of channelization, seasonality of flow, and the intensely urban setting. The Salton Sea supports a number of fish species with the most abundant species being sargo, bairdella, orangemouth corvina, desert pupfish, longjaw mudsucker, and sailfin molly. Drainage ditches crossed along the northeast corner of the sea may support desert pupfish. Numerous ditches and canals along the route may also provide habitat for razorback sucker.

Threatened, Endangered, Candidate, and Other Special-Status Species

Threatened, Endangered, Candidate, and Other Special-Status Plants. A total of 49 special-status plant species have the potential to occur in the proposed project study area (**Appendix K-3**). Of these, nine species are federally listed as threatened or endangered, seven are state listed as threatened or endangered, and 39 are nonlisted special-status species. Surveys along the Riverside to the California/Arizona border are complete. It should be noted that the rainfall along this project route was extremely low this year. As a result, special-status plant population numbers were low and some species failed to germinate this year.

Salton milk-vetch, a BLM sensitive and CNPS List 4 species, is the only special-status plant that has been located to-date along the Riverside to the California/Arizona border route. Eight occurrences of this species were located and can be found on the Wister, Iris, Mortmar, and Salton quadrangles.

Threatened, Endangered, Candidate, and Other Special-Status Wildlife. A total of 111 special-status wildlife species have the potential to occur in the proposed project study area (**Appendix K-4**). Of these, 10 species are federally listed as threatened or endangered, 13 are state listed as threatened or endangered, and 88 are nonlisted special-status species. The following special-status wildlife species or habitat for these species were located along the project route:

- Desert tortoise. Potential habitat for desert tortoise was located throughout much of the Colorado Desert portion of the project route.

- Coachella Valley fringe-toed lizard. Suitable habitat for the Coachella Valley fringe-toed lizard was identified along the project route between White Water Canyon and the Coachella Valley.

- Flat-tailed horned lizard. Potential habitat for the flat-tailed horned lizard was identified along the project route from the southern end of the Salton Sea to the Arizona border.

- Quino checkerspot butterfly. Habitat for the Quino checkerspot butterfly occurs along the project route east of Riverside.

- Southwestern willow flycatcher, California black rail, Yuma clapper rail, least Bell's Vireo, western yellow-billed cuckoo. Suitable riparian and emergent wetland habitat for these species was identified in the vicinity of the Colorado River. Additional habitat for Yuma clapper rail and California rail occurs near the Salton Sea.

- California gnatcatcher. Potential habitat for the California gnatcatcher was identified near the project route east of Riverside.

- Stephens' kangaroo rat. Potential habitat for the Stephens' kangaroo rat was identified along the project route near Riverside.

Appendix K-4 provides the status, distribution, and habitat requirements of all potentially occurring special-status species, and the wildlife resource tables in **Appendix G** provide the locations of special-status species or habitat along the project route.

Threatened, Endangered, Candidate, and Other Special-Status Fish. A total of two special-status fish species have the potential to occur in the project study area (**Appendix K-5**). Of these, one species is federally listed as threatened or endangered and one is state listed as threatened or endangered.

Los Angeles to Riverside

The project route lies entirely within the Southwest Region of the California Floristic Province. The project route crosses portions of the South Coast and Peninsular Ranges subregions. Originating in the City of Los Angeles, the route passes through predominantly urban areas, skirting the northern edge of the Puente Hills and crossing several seasonal drainages.

Along the railroad right-of way, most of the project route has been cleared of vegetation. When vegetation is present, it is composed of ruderal species or a mosaic of ruderal species and species from adjacent habitats. The major habitats adjacent to this project route are urban lands, although small pockets of annual grassland, agricultural lands, and riparian habitat may be present. At many points along the project route, ornamental plant species, such as eucalyptus, oleander, cypress, palms, and pepper trees, are used to block views of the route from surrounding residential and industrial uses.

The project route crosses several urban drainages, streams, and rivers. Most of these waterways have been placed into concrete-lined channels. A few channels, such as the San Gabriel River, are soft bottom channels with some willow scrub riparian habitat.

Vegetation and Wildlife

Common Plant Communities and Associated Wildlife Habitat

Urban Landscaping. Urban lands are present adjacent to much of the project route. Vegetation in urban areas consists of ornamental trees and shrubs, lawns, and flowerbeds.

Ruderal Habitat. Most of the habitat along the project route consists of ruderal habitat. Refer to the San Luis Obispo to Bakersfield route for a discussion of this plant community and its wildlife associations.

Annual Grassland. Annual grassland exists adjacent to this project route in areas east of the San Gabriel River. Refer to the Point Arena to Sacramento route for a discussion of this plant community and its wildlife associations.

Agricultural Lands. Agricultural land is located adjacent to the project route near the Ontario Airport. Refer to the San Luis Obispo to Bakersfield route for a discussion of this plant community and its wildlife associations.

Sensitive Plant Communities and Associated Wildlife Habitat

Mixed Willow Scrub. Mixed willow scrub is present near the project route along the San Gabriel River. Refer to the San Luis Obispo to Los Osos Loop route for a discussion of this plant community and its wildlife associations.

Fish. This route passes through the Los Angeles, San Gabriel, and Santa Ana River watersheds. Portions of these rivers provide habitat for several sensitive fish species, including Pacific lamprey, Arroyo chub, Santa Ana sucker and Santa Ana speckled dace. However, fish habitat in the reaches of these watersheds crossed by the project route is extremely limited because of channelization, seasonality of flow, and the intensely urban setting.

Threatened, Endangered, Candidate, and Other Special-Status Species

Threatened, Endangered, Candidate, and Other Special-Status Plants. A total of 22 special-status plant species have the potential to occur in the proposed project study area (**Appendix K-3**). Of these, four species are federally listed as threatened or endangered, four are state listed as threatened or endangered, and 18 are nonlisted special-status species. Surveys for special-status plants along the Los Angeles to Riverside route are complete. No special-status plants have been previously recorded or were located during the 1999 field surveys. Additionally, no suitable habitat for special-status plants was observed along this primarily urban route.

Threatened, Endangered, Candidate, and Other Special-Status Wildlife. A total of 14 special-status wildlife species have the potential to occur in the project study area (**Appendix K-4**). All but one (Delhi sands flower-loving fly) are nonlisted special-status species. Habitat for the Delhi sands flower-loving fly was found in the vicinity of the Kinder-Morgan facility in Colton. Refer to **Appendix K-4** for status, distribution, and habitat requirements of all potentially-occurring special-status species, and the wildlife resource tables in **Appendix G** for locations of special-status species or habitat along the project route.

Threatened, Endangered, Candidate, and Other Special-Status Fish. A total of four special-status fish species have the potential to occur in the project study area (**Appendix K-5**). All are nonlisted special-status species.

Los Angeles to Anaheim

The study area for this project route lies entirely within the South Coast subregion of the Southwest Region of the California Floristic Province. Originating in the City of Los Angeles, the route passes entirely through urban areas along roadways and railroad rights-of-way before terminating in Anaheim. The route crosses the Los Angeles and Rio Hondo rivers, both channelized streams supporting limited vegetation.

Vegetation and Wildlife

Common Plant Communities and Associated Wildlife Habitat

Urban Landscaping. Urban lands are present adjacent to much of the proposed route. Vegetation in urban areas consists of ornamental trees and shrubs, lawns, and flowerbeds.

Ruderal Habitat. Most of the non-landscaped vegetation along the route consists of ruderal habitat. Refer to the Sacramento to California/Nevada border route for a discussion of this plant community and its wildlife associations.

Sensitive Plant Communities and Associated Wildlife Habitat. No sensitive plant communities were located along the Los Angeles to Anaheim route.

Fish. The Los Angeles and Rio Hondo rivers potentially provide habitat for several sensitive fish species, including Pacific lamprey, Arroyo chub, Santa Ana sucker, and Santa Ana speckled dace. However, fish habitat in the reaches of these watersheds crossed by this route is very limited because of channelization, seasonality of flow, and the intensely urban setting.

Threatened, Endangered, Candidate, and Other Special-Status Species

Threatened, Endangered, Candidate, and Other Special-Status Plants. A total of 10 special-status plant species have the potential to occur in the project study area (**Appendix K-3**). All are nonlisted special-status species. Surveys for special-status plants along the Los Angeles to Anaheim route are complete. No special-status plants have been previously recorded or were located during the 1999 field surveys. Additionally, no suitable habitat for special-status plants was observed along this primarily urban route.

Threatened, Endangered, Candidate, and Other Special-Status Wildlife. No special-status wildlife species have the potential to occur in the project study area (**Appendix K-4**).

Threatened, Endangered, Candidate, and Other Special-Status Fish. A total of four nonlisted special-status fish species have the potential to occur in the project study area (**Appendix K-5**).

V. CULTURAL RESOURCES

Prehistory, Ethnography, and History

Detailed information on the prehistory, ethnography, and history of each project route is presented in the cultural resources inventory reports currently being prepared for each project route. In each cultural resources inventory report, the description of prehistory presents a synopsis of the current understanding of the cultural and technological changes through time from about 11,000 years ago up to the arrival of Europeans. The ethnography discussion provides a brief overview of the culture and history of the Native Americans living in the project study areas when Europeans arrived. The project study areas cross the territory of numerous distinct California Native American groups. The historic setting for each project route focuses on major themes in history such as early exploration and fur trappers, missions and land grants, development of transportation routes, settlement, farming, ranching and lumber, mining, and water conveyance.

Project Study Areas and Delineation of Areas of Potential Effects

The project study areas are those portions of the project routes where the fiber optic cable and associated facilities will be installed using ground-disturbing techniques. The study areas for routes for buried cable within existing road rights-of-way will include both sides of the road right-of-way. The study areas for buried routes along railroads or electrical or pipeline corridors include the entire width of railroad, road, or utility rights-of-way. In locations along the project routes where the cable will be placed inside an existing idle pipeline, the study areas included the entire route so that any cultural resources identified along the route could be avoided when siting assist points or other access locations.

For all project routes, the study areas include proposed locations for regenerator or OP-AMP stations and any adjacent structures or historic resources that could be indirectly affected by siting of the regenerator/OP-AMP stations, the grading of existing access roads, and any staging areas located outside paved or graveled areas for equipment or bore pits.

For compliance with Section 106 of the National Historic Preservation Act, when applicable, the proposed undertaking (defined as an activity or project under the direct or indirect jurisdiction of a federal agency) includes the entire area of potential effects (APE). The APE for the each project route has been defined by the lead federal agency for that project and may include the entire route or be limited to federal lands or lands under an agency's jurisdiction (e.g., Corps and wetlands), depending on the judgment of the lead federal agency. The APE will include all proposed associated facilities, such as regenerator/OP-AMP stations, minor improvement to existing access roads, and any staging areas located outside paved or graveled areas for equipment or bore

pits. The APE also includes any resources that could be indirectly affected by siting of the regenerator/OP-AMP stations.

No new access roads will be required to install the fiber optic cable lines along any of the routes. Construction equipment staging areas will be located within previously disturbed areas where there is no potential to affect significant cultural resources.

Inventory Methods

Records Search

Before the cultural resources inventories commenced, information was obtained from several sources on any previously recorded cultural resources and previously conducted cultural resource surveys in the project study areas. The primary sources for records include the Information Centers of the California Historical Resources File System, which includes information on all previous surveys and previously recorded resources as well as listings of properties on the California Register of Historical Resources, the National Register of Historic Places, California Inventory of Historic Resources, and California Historical Landmarks.

Applicable land-owning agencies that maintain records of cultural resources, such as the BLM and the Native American Heritage Commission in Sacramento (see below), were also contacted

Project specific historical research has been conducted for the project routes where historic-period resources are likely to be found but where field inventory would be impossible because of the ground surface being obscured by pavement. For these routes, focused historical research has been conducted to determine whether historic or prehistoric resources might be buried beneath urban, developed settings. Repositories for sources dealing with historic resources include the California Room of the California State Library and other local repositories. At these repositories, historical maps were reviewed to determine the potential for disturbing potentially significant resources. Project-specific historical research is described in each of the cultural resources inventory reports currently being prepared for each project route. A summary of the historical research conducted for each project route is provided in **Appendix M**.

The records search parameters include identification of any surveys or sites within primarily 1/8 mile of the project study areas. For some project routes, the record search covered 1/4 mile to better assess the archaeological resources of the study areas. The results of the records search indicated the previously recorded sites located within prescribed research areas, as well as results of previous surveys that have been conducted in or near the project study areas. A summary of the methodology and results of the records search for each route is provided in **Appendix M**.

Native American Contacts

The California Native American Heritage Commission (NAHC) has been contacted for all of the project routes to obtain information from their Sacred Lands Files as well as to obtain lists of Native American individuals or organizations potentially interested in or having concerns about each project route. All individuals and organizations identified by the NAHC have been contacted by letter and asked to provide comments or identify any concerns or issues pertaining to each project route. A copy of the list of Native Americans provided by the NAHC for each project route is included in the cultural resources inventory reports currently being prepared for each project route. Any responses received will be included in the cultural

resources inventory reports. An example of the Native American contact letter for one of the routes is provided in **Appendix L**.

Field Survey Methods

Intensive pedestrian surveys have been conducted for each project route. Ninety-nine percent of the field surveys have been completed. **Appendix G** shows the results of the field inventories. The surveys have been accomplished by multi-person crews walking the study areas at intervals that did not exceed 20 meters in width. Localized environment information, archaeological site and isolated artifact identification and locational data, and any additional pertinent information are currently being recorded on site record forms, which will be available to the CPUC.

The surveys were limited to inventorying surface artifacts and features. No subsurface probing was conducted, and no artifacts were collected. Everything observed was left where it was found. Isolated artifacts found within the project study areas are being marked on a map and briefly described as to artifact type, material, and color.

Archaeological sites encountered within the project study areas were recorded, except for previously recorded sites, which had been adequately recorded previously. All artifacts and features will be flagged in the field to delineate site boundaries and provide a visual array to aid in characterizing the configuration and densities of artifacts. A site datum was established for mapping purposes and provenience control, and the site will be mapped by compass and distance-by-pace methods. Site characteristics were documented on standard site record forms from the California Department of Parks and Recreation. Tools were provenienced with reference to the site datum and described, and diagnostic tools will be drawn. Photographs showing overviews of the site within its environmental context were also taken. On completion of site recordation, the pin flags and any other additional flagging or site indicators were removed. Finally, the temporary site numbers were inscribed on metal tags on plastic surveyor's "whiskers" placed at each end of the site on the centerline of the project route. Identified cultural resource sites will be assigned temporary field numbers relating to their location on topographic maps and were located on the construction drawings.

A cultural resource inventory has been completed for each project route using the methods and procedures described above. For each project route, ways to avoid any potential project impacts on identified cultural resources are being formulated. The assigned project archaeologist and the project engineer are currently conducting field visits to each identified cultural resource site to determine which of the possible methods of avoiding each site are feasible. **Appendix G** shows the avoidance methods that have been identified for each site on each project route.

Results of Inventory

The results of the cultural resources inventories are being presented in separate reports for each project route. The reports include detailed descriptions of the methods used in the inventory; the results of prefield research; descriptions of each identified cultural resource; recommendations for avoiding impacts on each potentially significant cultural resource; completed site record forms; results of Native American consultations; a construction monitoring plan, if necessary; and an atlas illustrating the project route, survey coverage, and locations of identified cultural resources. These reports are currently in preparation. **Appendix G** shows the results of the field inventories conducted to date. Before construction, all cultural resource inventories will be completed and submitted to the CPUC for their approval.

Regulations, Approvals, and Permits Applicable to Cultural Resources

State Regulations

As the designated state lead agency for approval of the proposed project, the California Public Utilities Commission is responsible for compliance with CEQA requirements for the identification and treatment of historic and prehistoric cultural resources.

CEQA requires that the effects of public or private projects financed or approved by public agencies on cultural resources must be assessed. Cultural resources are defined as buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, or scientific importance. CEQA requires that if a project results in significant effects on important cultural resources, alternative plans or mitigation measures must be considered. Only resources meeting the CEQA definition of significant need to be addressed.

Because the project routes cross nonfederal land, it will also be necessary to comply with state laws pertaining to the inadvertent discovery of human remains of Native American origin, which falls within the jurisdiction of the Native American Heritage Commission (Pub. Res. Code Sec. 5097 et seq.). The procedures that must be followed if burials of Native American origin are discovered on nonfederal land in California during the project construction are described in the "Cultural Resources" section in Chapter 5.

Federal Regulations

Because implementation of the proposed project may require approval from federal agencies, and because historic properties could be affected, compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations (36 CFR Part 800) is also necessary. Section 106 requires federal agencies to take into account the effects of their actions on properties that may be eligible for listing or are listed on the National Register of Historic Places.

For the purpose of compliance with Section 106, a lead federal agency will be designated for each project route where federal involvement occurs. At this time, the Riverside to California/Arizona border project route is under the jurisdiction of the Riverside Bureau of Land Management. Portions of the Sacramento to California/Nevada border project route cross the Tahoe National Forest. For the remainder of the project routes, the only federal involvement dictated by the requirements to obtain a Corps Section 404 permit. For all project routes with federal jurisdiction, the lead federal agency will be coordinating consultation with the California State Historic Preservation Officer and will also consult with any other cooperating federal agencies.

The Native American Graves Protection and Repatriation Act specifies the procedures that agencies must follow when burials of Native American origin are found on federal land (43 CFR Part 10). These procedures are described under "Cultural Resources" in Chapter 5.

Native American Lands

One route, between Riverside and the California/Arizona border, will pass through the Quechan Indian Tribe of the Fort Yuma Indian Reservation. However, the route will be placed in the UPRR railroad right-of-way. It is the railroad's position that no further coordination with the tribe is required.

Paleontological Resources

Fossils are considered by the Society of Vertebrate Paleontology to be a non-renewable resource. One purpose of a paleontological investigation is to document the presence of fossils in the geologic record. This is to provide a better understanding of the phylogenetic histories of species in the area or in general and provide keys to the history of evolution. In addition to revealing which species were present, the fossil record can also give indications of previous climates and paleotemperatures, topography, geography, rainfall, and proximity to water bodies.

The project routes cross diverse geologic formations. Fossil deposits may exist in sedimentary and cool volcanic flow rocks (i.e., sandstone, mudstone, and volcanic mud flows) throughout these formations. The geologic setting of the project routes is also discussed in "Geology and Soils."

Approach and Methodology

A literature search was conducted to determine the paleontological sensitivities of geologic units and paleontological localities previously identified along the project routes. The literature search consisted of a search and review of available published and unpublished literature, including locality information from the California Museum of Paleontology, Los Angeles County Museum, and San Bernardino County Museum; paleontological survey reports; and paleontologic locality maps. Interviews were conducted with Dr. Larry Barnes and Dr. Ed Wilson of the Los Angeles County Museum and Dr. Kathleen Springer of the San Bernardino County Museum to develop the sensitivities and significance of paleontological resources of the geologic formations along the project routes.

Published and unpublished literature indicates that the project routes and surrounding areas are underlain by bedrock formations having a moderate to high paleontological sensitivity (**Table 4.V-1**). Paleontological sensitivities of geologic units are determined by the potential for the recovery of fossil resources. Determining factors include the known fossil resources in the geologic unit, sedimentary rock types present, and the environment of deposition of the geologic unit.

Regional geologic maps for California identified geologic units, surficial sedimentary rocks, and cool volcanic flows present on the project routes (California Division of Mines and Geology 1977, Jones & Stokes Associates 1990). Although the presence of these deposits does not necessarily indicate the presence of fossils, these formations have the highest probability of preserving plant, animal, and invertebrate remains. **Table 4.V-1** summarizes the geologic units, age, and paleontological sensitivity for each project route. Fossilized micro and macro flora and fauna of marine and non-marine origin, including marine vertebrates, land mammals, and other vertebrates, have been recovered from formations exposed along the project routes. **Appendix N** lists previously identified fossil localities on the project routes.

Table 4.V-1. Paleontological Sensitivity of Geologic Units Potentially Occurring in the Project Study Areas

Geologic Units	Age	Paleontological Sensitivity
Point Arena to Sacramento		
Alluvium	Recent	High
Basin filling deposit	Recent	Low
Red Bluff Formation/non-marine sediments	Pleistocene	High
Alluvial fan deposits	Pleistocene to Recent	Low

Table 4.V-1. Paleontological Sensitivity of Geologic Units Potentially Occurring in the Project Study Areas

Geologic Units	Age	Paleontological Sensitivity
Marine sediments and marine terraces deposits	Pleistocene	High
Non-marine sediments	Pliocene/Pleistocene	High
Cobb Mountain Formation	Pliocene volcanics	High
Merced Formation/marine sediments	Upper Pliocene	High
Tehama Formation/fluvatile/lacustrine	Pliocene	High
Volcanic rock	Pleistocene	Low
Marine sediments	Lower Miocene	High
Markley Formation/marine sediments	Eocene	High
Marine rocks	Cretaceous	High
Chico/Gualala Formation/marine sediments	Upper Cretaceous	High
Marine sediments	Lower Cretaceous	High
Franciscan Formation	Jurassic	Low
Sacramento to California/Nevada Border		
Alluvial fan deposits	Pleistocene to Recent	Low
Non-marine sediments	Pliocene/Pleistocene	High
Fluvial deposits in the Truckee area, including some lake beds	Pleistocene	None
Non-marine sediments	Miocene	High
Non-marine sediments	Eocene	High
Mixed metamorphic, granitic, and volcanic rocks	Cretaceous	None
San Francisco to Santa Clara		
Alluvium	Recent	Low
Marine sediments and marine terrace deposits	Pleistocene	High
Franciscan Formation	Needs local inspections to determine if that part of the unit is potentially fossiliferous	
Pittsburg to Sacramento		
Stream and channel deposits	Recent	Low
Basin filling deposits	Recent	Low
Alluvial fan deposits	Pleistocene to Recent	Low
Non-marine sediments	Pleistocene	High
San Luis Obispo to Bakersfield		
Franciscan Formation	Jurassic	Low
Marine sediments	Cretaceous	High
Marine sediments/thin alluvium	Miocene	High

Table 4.V-1. Paleontological Sensitivity of Geologic Units Potentially Occurring in the Project Study Areas

Geologic Units	Age	Paleontological Sensitivity
In 12-inch pipeline in sensitive units	Various	Low
Alluvium	Pleistocene	Low
San Luis Obispo to Los Osos Loop		
Alluvium	Pleistocene to Recent	High
Marine sediments and marine terrace deposits	Pleistocene	High
Franciscan Formation/thin alluvium	Cretaceous	None
Riverside to California/Arizona Border		
Alluvial fan deposits	Pleistocene	High
Non-marine sediments	Pliocene	High
Lake Coachilla sediments	Pleistocene	High
Alluvium	Pleistocene to Recent	High
San Timoteo Formation	Pliocene/Pleistocene	High
Granitic rocks	Cretaceous	Low
Los Angeles to Riverside		
Alluvium	Recent	Low
Fernando Formation	Upper Pliocene	High
Puente Formation	Upper Miocene	High
Granitic rocks	Cretaceous	Low
Los Angeles to Anaheim		
Alluvium	Recent	Low

Applicable Regulations, Approvals, and Permits

The Antiquities Act of 1906 and the Federal Land Policy and Management Act of 1976 mandate the protection of significant paleontological resources on federally owned, managed, or controlled lands. Additionally, California Pub. Res. Code Section 5097.5 states that it is a misdemeanor for any person to knowingly and willingly excavate, remove, or destroy a vertebrate paleontological site, including fossilized footprints or any other paleontological feature on public lands without the permission of the public agency having jurisdiction over the land.

Proposed Project Route Settings

Point Arena to Sacramento

The entire project route has been surveyed for cultural resources. The inventory identified four prehistoric and nine historic cultural resources within the project route. Although a number of previously recorded prehistoric sites had been identified during the records search as being along the project route, these ultimately fell outside the project right-of-way or no longer existed.

Three of the prehistoric sites can be avoided by routing the fiber optic cable around or under the resource. The fourth resource is a culturally sensitive area consisting of 13 separate lithic scatters that are located along an approximately 10-mile stretch of Highway 175/29. In this area, the road passes along the base of Mt. Konocti, a primary source for obsidian during prehistoric times. The majority of these previously recorded resources noted that the site boundaries were difficult to impossible to define because of the large amount of background obsidian existing throughout the region. Attempts to relocate the previously recorded sites confirmed that it was not feasible to distinguish the cultural material from the naturally occurring obsidian. Where feasible, the cable will be placed within the road prism. In areas where it is not possible to place the cable in the road prism, construction through this area will consist of trenching (rather than plowing) and the construction will be monitored to ensure that any significant buried cultural deposits are identified. If potentially significant resources are discovered, then work will halt and the area will be bored.

The nine identified historic resources consist of Highway 16 and its associated features, four canals, one railroad crossing, and three bridges on rural Yolo County roads. None of these historic resources will be affected because the fiber optic cable will avoid canals, culverts, and the railroad and will be attached to bridges so as not to detract from their historic qualities.

In addition to the 13 identified cultural resources, nine isolated cultural objects and features were noted and include four prehistoric artifacts, a mortared rock retaining wall, a concrete culvert, a spring box, concrete stairs, and some large timbers. These isolated cultural resources were documented but do not need to be considered further here.

The project route generally crosses Jurassic to Recent age geologic units and has a low to high sensitivity for paleontological resources (**Table 4.V-1**).

All identified cultural and paleontological resource sites located along this route will be avoided by rerouting around or boring beneath sites.

Sacramento to the California/Nevada Border

Most identified cultural resources along the portion of this project route within railroad right-of-way are features of the railroad. The project route is crossed by several in-use historic canals, ditches, or water pipes. Other historic resources identified include one debris dump, two mining disturbance areas, intact and abandoned portions of Old Highway 40, portion of a wagon road, five retaining wall features, a probable residence location, four foundations, two town sites, two levees, nine bridges, one small concrete structure, and a site with a small segment of ditch and two depressions. In addition, one pipeline that crosses the project route is routed overhead above the surface where construction will take place. Prehistoric resources include four lithic scatters and one isolated milling slab.

The project route generally crosses Pleistocene to Recent age geologic units and has a low to high sensitivity for paleontological resources (**Table 4.V-1**).

All identified cultural and paleontological resource sites located along this route will be avoided by rerouting around or boring beneath sites.

San Francisco to Santa Clara

The record search indicated that 17 cultural resources had been previously identified on or adjacent to the project route, including eight prehistoric sites, seven sites consisting of historical structures, one historical artifact scatter (destroyed), and one site of an unknown nature that has been destroyed since it was originally recorded. A field inspection of the project route was conducted by an archaeologist to relocate previously recorded archaeological sites and to identify any areas that have not been developed. The majority of the route was inspected by vehicle because the surface of the ground was not visible due to urban development. Areas that had not been developed were subjected to a pedestrian archaeological survey. In addition, research on the distribution of prehistoric and historic sites in the project area was conducted to determine the potential for buried historic or prehistoric cultural resource sites that could be found during construction.

Because this project route is located within existing duct, streets in developed areas, and an existing pipeline, any sites in the project area would already have been disturbed during previous construction. However, the following measures will be implemented. Three of the prehistoric site locations within the project route are currently paved or otherwise covered. These sites will be subjected to archaeological monitoring during construction. The remainder of the prehistoric sites will be avoided by placing the cable in a bore hole below the site. All historical structures will be avoided by the cable. Based on the background research and the locations of construction and avoidance measures, there is little potential for the construction to effect any intact prehistoric or historic cultural resources.

The project route generally crosses Jurassic to Recent age geologic units and has a low to high sensitivity for paleontological resources (**Table 4.V-1**).

Pittsburg to Sacramento

The entire project route has been surveyed for cultural resources. Identified resources along this project route include two in-use railroads, one abandoned railroad (five segments), and one bridge. Impacts on all significant and potentially significant resources along this project route will be avoided through project design. The two in-use railroads will not be damaged or disturbed by the project. The abandoned railroad segments retain little to no integrity and do not need to be avoided by the proposed project. The bridge has been determined to be ineligible for listing on the National Register of Historic Places and does not need further consideration. The potential for uncovering buried cultural resources on the project route is low because the project route is located in areas with low sensitivity for prehistoric cultural resources and low to moderate sensitivity for historic cultural resources. No areas have been identified as requiring cultural resources monitoring.

The project route generally crosses Pleistocene to Recent age geologic units and has a low to high sensitivity for paleontological resources (**Table 4.V-1**).

San Luis Obispo to Bakersfield

The most sensitive portion of the project route is the segment from San Luis Obispo to Atascadero. The area in and around San Luis Obispo was heavily populated both in prehistoric and historic eras. The portion of the project route to the east is less sensitive. The Southern San Joaquin Valley has been severely altered by agricultural practices and petroleum exploration and development over the last century, resulting in a degree of disturbance that precludes the existence of intact prehistoric cultural resource sites over much of the area. However, the entire project route has been surveyed.

Fifteen distinct cultural resources have been identified. These resources include both prehistoric and historic sites.

The first of these resources, the Chevron Pipeline and its associated pumping stations, constitute an historic resource because of its age. Avoidance of the pipeline is unnecessary because many portions have been replaced or removed. The pipeline is merely coincident with the alignment of its historic counterpart. Two of the pumping stations are planned for location of OP-AMP facilities; Shandon and Middle Station. These stations have been inventoried and are being evaluated to ensure that the siting of such facilities is congruent with the character of existing properties. The remaining stations are adjacent to the pipeline but are not associated with disturbance from construction.

The location planned for the third OP-AMP facility occurs on a 15-acre parcel with scattered and diffuse burnt bone and shell on its Eastern half. Coordination regarding this property will focus on siting the facilities such that this resource is avoided.

Four additional prehistoric sites have been located across the project route. All of these resources will be avoided by routing the cable around them or boring underneath them.

The railroad whose rights-of-way are planned for use in the project also constitute historic resources. The railroad and associated sidings and culverts, however, are not in the area of direct impact. Trenching will occur adjacent to the railroad, with occasional bores underneath where the cable crosses the track. The railroad, as a resource, will not be impacted by project activities.

Also associated with the railroad are the Bakersfield train station, two historic warehouses, a cement feature with the impression "1915", a foundation with associated historic debris, and a siding with the remains of granaries and other freight facilities. These six resources will be avoided. The first five are outside of the area associated with trenching and ground disturbance. The spur line and granaries are within the area planned for trenching. Recommendations will indicate boring underneath this resource.

Along the last leg of the project route on R Street in Bakersfield surveyors located two historic buildings: a warehouse and the Southern Pacific Freight Station. In street trenching along this portion of the project route will result in no disturbance to these properties.

The project route crosses Jurassic to Pleistocene age geologic units and varies from low to high sensitivity for paleontological resources (**Table 4.V-1**).

San Luis Obispo to Los Osos Loop

This project route has a moderate to high sensitivity for prehistoric and historic cultural resource sites. The project area occurs in a region associated with Chumash, Spanish, Euroamerican, and Chinese archaeological deposits. Identified resources include three prehistoric sites and two historic culverts and a wall constructed by Works Progress Administration. All of these resources will be avoided by either boring, in-street trenching, or the use of existing conduit. All areas planned for ground-disturbing construction within the historic City of San Luis Obispo are incorporated into a monitoring plan and sensitivity study.

The project route generally crosses Cretaceous to Recent age geologic units and has no sensitivity to high sensitivity for paleontological resources (**Table 4.V-1**).

All identified cultural and paleontological resource sites along this route will be avoided by rerouting around or boring beneath sites.

Riverside to California/Arizona Border

The project route is located primarily along the UPRR and the Kinder-Morgan petroleum pipeline, much of it through rural areas and desert. The project route was surveyed by Jones & Stokes Associates archaeologists in March and April 1999, using intensive survey techniques. An archaeologist walked on either side of the pipeline alignment covering a transect of not more than 20 meters and examining the ground surface for indications of historic or prehistoric cultural resource sites. A 3 mile stretch through the Algodonnes Duens area was given a cursory survey because of safety considerations. This survey resulted in the discovery, recordation, or updating of 21 cultural resource sites. Two previously recorded sites had been demolished. Extant sites include the historic railroad (CA-Imp-3424H), four historic railroad sidings and towns (CA-RIV-3440H, C-Iris-B-1, C-Amos-A-1, C-Ogilby-A-1), two railroad bridges (C-Araz-A-2, C-Yuma East-B-2), two historic structures (CA-RIV-5706H, C-Yuma East-B-3), a historic ranch (CA-RIV-2262H), three canals (C-Iris-A-1, C-Araz-A-1, C-Yuma East-B-1), an historic landmark (C-Yuma East-B-4), two historic debris scatters (C-Cabazon-B-1, C-Myoma-B-1), two prehistoric sites (C-La Quinta-A-1, C-La Quinta-A-2), and one site with both historic and prehistoric components (CA-RIV-3946/H). Because the cable will be installed in an existing pipeline, these sites can be avoided by not accessing the pipeline within the site boundaries. Impacts on the railroad can be avoided by boring under the railroad for cable crossings.

The project route generally crosses Cretaceous to Pleistocene age geologic units and has a low to high sensitivity for paleontological resources (**Table 4.V-1**).

All identified cultural and paleontological resource sites along this route will be avoided by rerouting around or boring beneath sites.

Los Angeles to Riverside

Because the majority of the project route is located within urban areas of greater Los Angeles and for the safety of the field crew, the entire project route was first inspected by vehicle. Any sensitive areas, including undeveloped areas, previously recorded sites, and areas with possible historic buildings, were subjected to a pedestrian survey. In general, the project route consists of a narrow UPRR right-of-way through residential or commercial neighborhoods. The project area is extensively disturbed by development.

The survey resulted in the identification of three cultural resource sites: the railroad, a railroad station, and the remains of a cement plant. The railroad (C-Los Angeles-A-1) is the historic Southern Pacific line. Impacts on this resource can be avoided by boring under the railroad for cable crossings, and not installing the fiber optic cable in the railroad grade. The East Los Angeles railroad station (C-Los Angeles-B-1) is a historic building that originally functioned as a railroad depot. Impacts on this resource can be avoided by installing the fiber optic cable on the north side of the railroad tracks. CA-SBr-7976H is the remains of a Portland Cement plant. Impacts on this resource can be avoided by installing the fiber optic cable on the north side of the railroad tracks.

The project route generally crosses Cretaceous to Recent age geologic units and has a low to high sensitivity for paleontological resources (**Table 4.V-1**).

All identified cultural and paleontological resource sites along this route will be avoided by rerouting around or boring beneath sites.

Los Angeles to Anaheim

Because the project route is primarily in railroad rights-of-way and city streets of Los Angeles and Anaheim and for the safety of the field crew, the entire project route was first inspected by vehicle. Any sensitive areas, including undeveloped areas, previously recorded sites, and areas with possible historic buildings, were subjected to a pedestrian survey. Any prehistoric sites present within the project area would likely to have been disturbed during construction and urban development and would not be visible to archaeologists during a pedestrian survey. Map research indicated that the buried historic resources are not likely because street alignments have changed little since they were laid out.

The survey resulted in the identification of two cultural resource sites: the railroad and a railroad station. The railroad (C-Los Angeles-A-1) is the historic Southern Pacific line. Impacts on this resource can be avoided by boring under the railroad for cable crossings and not installing the fiber optic cable in the railroad grade. The railroad station (C-Whittier-A-1) is a historic building that originally functioned as a railroad depot. Impacts on this resource can be avoided by installing the fiber optic cable on the north side of the railroad tracks.

The project route generally crosses a Recent age geologic unit and has a low sensitivity for paleontological resources (**Table 4.V-1**).

All identified cultural and paleontological resource sites along this route will be avoided by rerouting around or boring beneath sites.

VI. GEOLOGY AND SOILS

Geology and Seismicity

A general geologic map of the state by Jennings (1977) and regional earthquake fault maps by Hart and Bryant (1997) were used to describe existing geologic and seismic conditions along the project routes. The description of existing soil characteristics along the project routes was based on a general soil map of the state (Pacific Gas and Electric Company 1989) and the author's knowledge of typical soil conditions along roads, railroads, and utility rights-of way.

The project routes pass through a wide range of slope conditions. The slope of the long axis (as opposed to the sideslope) along most of the routes is generally less than 10 percent because the routes tend to follow gently sloping road and railroad grades.

The project routes cross a wide variety of geologic formations and landforms. The rocks and sediments may range from deep, unconsolidated sediments found in valley areas to hard rock found within inches of the ground surface. However, most of the routes pass through stable terrain. There are no known unique geologic features along any of the project routes.

The project routes pass through areas that are subject to strong earthquake-induced ground shaking and pass over active and potentially active earthquake faults. The faults are subject to ground surface displacement, which may occur in a variety of relative motions depending on the type of fault involved. In a few areas, the sediments underlying the routes are subject to earthquake-induced liquefaction, which may cause differential ground settlement and lateral spreading. Conditions most favorable for liquefaction include a fault

capable of causing ground shaking and the presence of clean, loose, saturated sandy soils within 50 feet of the ground surface.

Soils

Soil characteristics vary widely throughout the areas crossed by the project routes. This variation is due in large part to a wide range of topography, parent material, climate, vegetation, and disturbances associated with past construction in the project route rights-of-way (e.g., road, railroad, pipeline, utility). Soils along the project routes vary from rocky and sandy textures to clayey textures. In some areas, the soils have been compacted as a result of past construction in the rights-of-way. The soils also vary in terms of drainage characteristics, depth to rock, fertility, expansion potential, amount and type of protective vegetation cover, and other characteristics.

Soils along the project routes have variable susceptibility to erosion, ranging from slight to high erosion hazard ratings. Portions of some of the routes, such as along existing utility rights-of-way, have permanent erosion control measures, such as water bars, already in place.

Regulations, Approvals, and Permits Applicable to Geology and Soils

A storm water pollution prevention plan (SWPPP) (which includes erosion and sediment control measures) is required by EPA to comply with National Pollutant Discharge Elimination System (NPDES) requirements. A SWPPP for each project route is currently being prepared and implemented (see Chapter 2 for a summary of erosion control measures and **Appendix E** for an example of a typical SWPPP). The EPA has delegated authority to the state regional water quality control boards (RWQCBs) to administer the NPDES program.

VII. HAZARDS AND HAZARDOUS MATERIALS

Hazards and hazardous materials issues include handling of hazardous materials, disposal of hazardous waste (unexpectedly encountered during trenching and construction activities), training of construction workers (responsibility of the construction contractor), potential risk of upset and exposure to the community from an unexpected release or spill, and fire hazards. The CEQA environmental checklist (**Appendix A**) identifies eight areas of potential concern under the issue of hazards and hazardous materials.

Regulations, Approvals, and Permits Applicable to Hazards and Hazardous Materials

A variety of regulatory issues are related to the handling and disposal of hazardous materials and waste, including proper training of personnel handling these materials.

Workers exposed to hazardous waste (unexpectedly encountered during construction) should be properly trained in accordance with Occupational Safety and Health Administration guidelines[1]. This training allows for worker safety and proper handling and knowledge of testing instruments and safety equipment (e.g., respirators).

[1] Refer to OSHA's Hazardous Waste Operations and Emergency Response (HAZWOPER) fact sheet 93-31, which specifies training for workers at hazardous materials sites (available http://www.osha-slc.gov/OshDoc/Fact_data/FSNO93-31.html)

Hazardous waste is to be handled and disposed of in accordance with the Resource Conservation and Recovery Act (RCRA) (40 CFR Part 260). Local jurisdictions (e.g., city or county health departments) may have area-specific requirements.

Consultation and coordination with regulatory land managers is required along certain portions of the project routes that may be susceptible to fire hazards. To achieve project approval, it may be necessary to prepare a fire prevention and management plan for a particular route to ensure that potential fire hazards are reduced.

Proposed Project Route Settings

A search of several government database resources is currently being conducted for each of the project routes. The database lists more than 3.5 million regulated and unregulated hazardous waste generators, leaking tank sites, toxic spills, and other sites affecting the environment throughout the United States. An information technology firm was retained to perform a search to seek out specific environmental hazards within 1,000 feet of the centerline of designated routes and to sort and standardize the data obtained from this database. The result is a complete library of environmental information that will be translated into mapped and site-specific reports for all aspects of a hazards analysis. The following databases were included in the search:

- National Priority List (NPL);
- RCRA Corrective Actions (CORRACTS);
- RCRA permitted treatment, storage, disposal facilities (TSD);
- State equivalent priority list (SPL);
- State equivalent CERCLIS list (SCL);
- Sites under review by EPA (CERCLID/NFRAP);
- Leaking Underground Storage Tanks (LUST);
- Solid waste landfills, incinerators, or transfer stations (SWLF);
- Additional federal, state and regional lists, where available;
- Toxic Release Inventory database (TRIS);
- Registered underground storage tanks (UST);
- Registered aboveground storage tanks (AST);
- RCRA registered small or large generators of hazardous waste (GNRTR);
- RCRA violations/enforcement actions; and
- ERNS and state spills lists.

The results of the database search will assist in reviewing the project routes and regenerator/OP-AMP station locations to ascertain existing contaminated areas and potential areas where hazardous substances to be avoided during construction activities.

VIII. HYDROLOGY AND WATER QUALITY

Approach and Methodology

For this analysis, information is provided for mapped drainages found on USGS 7.5-minute topographic quadrangle maps. Named drainages that will be crossed by the project routes are identified in **Appendix G**, along with water quality limited streams (streams with impaired water quality due to pollutants, including sediment load) and streams with designated 100-year floodplains. Over 90 percent of all waters of

the United States crossed by the project routes have been identified and mapped during 1999 spring and summer field surveys. **Table 4.VIII-1** identifies beneficial uses of drainages crossed by the project routes.

Table 4.VIII-1. Beneficial Uses of Major Natural Watersheds along the Project Routes

	Beneficial Uses																		
Waterbody	Mun	Agr	Proc	Ind	Gwr	Frsh	Nav	Pow	Rec1	Rec2	Comm	Warm	Cold	Biol	Wild	Rare	Migr	Spwn	Aqua
Sacramento River	√	√	●	√	--	--	√	√	√	√	--	√	√	--	√	--	√	√	--
San Joaquin River	√	√	√	●	--	--	●	●	√	√	--	√	√	--	√	--	√	√	--
Delta	√	√	√	√	--	--	√	●	√	√	--	√	√	--	√	--	√	√	--
South Bay Streams	--	√	●	●	√	√	--	--	√	√	●	√	√	--	√	●	√	√	--
Truckee River	√	√	●	√	√	√	●	√	√	√	√	●	√	●	√	√	√	√	●
Yuba River	√	√	●	●	--	--	●	√	√	√	--	●	√	--	√	--	●	√	--
Bear Creek	√	√	●	●	--	--	●	√	√	√	--	√	√	--	√	--	√	√	--
American River	√	√	●	√	--	--	●	√	√	√	--	√	√	--	√	--	√	√	--
Garcia River	√	√	●	√	●	●	●	●	√	√	√	●	√	●	√	●	√	√	√
Cache Creek	√	√	√	√	--	--	●	●	√	√	--	√	√	--	√	--	●	√	--
San Luis Obispo Creek	√	√	●	●	√	√	●	●	√	√	√	√	√	●	√	√	√	√	●
Kern River	√	√	√	√	√	●	--	√	√	√	--	√	●	--	√	√	--	●	--
Los Angeles River	√	●	●	√	√	●	●	●	√	√	●	√	●	●	√	●	●	●	●
San Gabriel River	√	√	√	√	√	●	●	●	√	√	●	√	√	●	√	√	●	●	●

√ = existing or potential beneficial use.
● = not specified as an existing or potential beneficial use.
I = intermittent beneficial use.
-- = unknown.

*Beneficial uses:

Mun = municipal and domestic supply.
Agr = agricultural supply.
Proc = industrial process supply.
Ind = industrial service supply.
Gwr = groundwater recharge.
Frsh = freshwater replenishment.
Nav = navigation.
Pow = hydropower generation.
Rec1 = water contact recreation.
Rec2 = noncontact water recreation.
Comm = ocean, commercial, and sport fishing.
Warm = warm freshwater habitat.
Cold = cold freshwater habitat.
Biol = preservation of biological habitats of special significance.
Wild = wildlife habitat.
Rare = preservation of rare, threatened, or endangered species.
Migr = fish migration.
Spwn = fish spawning.
Aqua = aquaculture.

Regulations, Approvals, and Permits Applicable to Hydrology and Water Quality

Section 303(d) of the Clean Water Act has led to the generation of a list of water quality limited streams. These streams are impaired by the presence of pollutants, including sediment, and are more sensitive to disturbance. This information is included in **Appendix G** to illustrate general water quality.

If soil disturbance exceeds 5 acres, a general construction activity permit under the National Pollutant Discharge and Elimination System (NPDES) (Section 402 of the Clean Water Act) will require implementation of a storm water pollution prevention plan (see Chapter 2 and **Appendix E**). Best management practices to reduce and control soil erosion related to project construction are specified in each plan. The NPDES permit will be administered by the appropriate RWQCB.

A Section 401 water quality certification (or waiver) from the RWQCBs are being required under the Clean Water Act and will be obtained by meeting the terms and conditions in Section 404 Nationwide Permit No. 12, as appropriate, issued by the Corps. Nationwide Permit No. 12 authorizes discharge of material for backfill or bedding for utility lines. Under Nationwide Permit No. 12 conditions, an applicant must demonstrate that any unavoidable in-water work would occur within the state agency's preferred work windows and that all practicable erosion control measures would be implemented.

DFG regulates streambed alterations, including release of materials into streams, under Section 1603 of the Fish and Game Code (see "State Policies and Regulations Concerning Waters of the United States" in the "Biological Resources" section of this chapter). Williams will obtain streambed alteration agreements from DFG, where necessary.

Executive Order 11988 (Floodplain Management) addresses floodplain issues related to public safety, conservation, and economics. It requires:

- avoidance of incompatible floodplain development,
- consistency with the standards and criteria of the National Flood Insurance Program, and
- restoration and preservation of the natural and beneficial floodplain values.

Proposed Project Route Settings

Point Arena to Sacramento

The project route from Point Arena to Robbins will pass through the Garcia River drainage and several coastal drainages, and continues east to the Russian River drainage. The project route continues east, passes to the southeast of Clear Lake. The project route could terminate at three possible locations, near the towns of Briggs or Robbins, or in Sacramento. The route then passes through Cache Creek, the Colusa Basin, and the Sacramento River watershed. The route crosses the Sacramento River at the Town of Knights Landing and continues north, ending at Robbins.

Average annual precipitation along the route varies greatly. Annual rainfall on the coast and in the coastal mountains ranges from 40 to 60 inches. Rainfall totals decrease to about 17 inches per year as the route approaches Sacramento.

The route encounters relatively steep drainages across the Coast Ranges. Portions of the Russian, San Pablo Bay, and Sacramento River drainages crossed by the routes are relatively low gradient.

Sacramento to the California/Nevada Border

This project route will originate in the Truckee River watershed at the California/Nevada border near Reno, follow the Truckee River Valley to the town of Truckee, cross over Donner Pass into the Yuba River watershed, continue down the Yuba River drainage, over Emigrant Gap to the Bear River watershed and cross into the American River watershed near Colfax. Between Colfax and Sacramento, the project will lie primarily within the American River watershed, crossing the American River and several tributary streams to the Sacramento River mainstream.

Average annual precipitation along this route ranges from about 32 inches in Truckee, to 60 to 80 inches in the higher elevations of the Sierra Nevada, to 17 inches in Sacramento.

This project route crosses relative steep, high elevation drainages as it crosses the Sierra Nevada. As the project route approaches Sacramento, the stream gradient decreases, and is relatively low as the project route enters the lower American River (below Folsom Lake) and Sacramento River watersheds.

San Francisco to Santa Clara

The project route is in highly urbanized areas. Streams crossed by this route are all small south San Francisco Bay tributaries and many are channelized and intermittent. Average annual precipitation along this route is 15 to 20 inches.

Pittsburg to Sacramento

The project route lies entirely within the San Joaquin and Sacramento river watersheds. Annual average precipitation along this route ranges from 10 to 20 inches. The terrain is relatively flat, and the natural streams crossed by this route, except for the Sacramento and San Joaquin rivers, are intermittent.

San Luis Obispo to Bakersfield

The project route originates on the coast and crosses over the Santa Lucia range to the more arid areas of Bakersfield. Except for upper San Luis Obispo and Santa Margarita creeks, which straddle the Santa Lucia range, drainages along the route are relatively flat. Average annual precipitation ranges from about 16 inches in San Luis Obispo to 5.7 inches in Bakersfield, with likely slightly higher precipitation in the western Santa Lucia range. Most streams east of the San Lucia range are intermittent.

San Luis Obispo to Los Osos Loop

The project route originates in San Luis Obispo Creek drainage and terminates in the Los Osos Creek drainage. The entire length of the project route lies within an area influenced by coastal conditions. Average annual precipitation is about 16 inches. The drainages have relatively low gradients throughout.

Riverside to the California/Arizona Border

The project route originates in the Santa Ana River drainage area; heads east through the San Gorgonio Pass between the San Bernadino and San Jacinto mountains; and continues east into the Coachella Valley, East Mesa, and Pilot Knob Mesa following the toe of the southwest slope of the Chocolate Mountains.

The project route lies in primarily arid areas with average annual precipitation ranging from 12 inches in the Los Angeles area to less than 4 inches as the route extends east to the border. Major drainages crossed include: Santa Ana River, San Gorgonio River, and Whitewater River. Because of the arid conditions, most drainages are intermittent.

Los Angeles to Riverside

The project route originates in the Los Angeles watershed, crosses the San Gabriel watershed, and terminates in the Santa Ana River watershed. The route passes through primarily urban areas, skirting the northern edge of the Puente Hills, and crosses portions of the South Coast and Peninsular Ranges. Mean annual precipitation is about 10 to12 inches per year. Most waterways are concrete-lined or rip-rapped but a few are soft bottom channels (e.g., San Gabriel River). Because of the arid conditions, most drainages are intermittent.

Los Angeles to Anaheim

The project route originates in the Los Angeles River watershed, crosses the San Gabriel River watershed, and terminates in the Santa Ana River watershed. Mean annual precipitation is about 10 to12 inches per year. The route occurs within a intensely urbanized setting, and most of the drainages crossed by the route are channelized or concrete-lined. Because of the arid conditions, most drainages are intermittent.

IX. LAND USE AND PLANNING

Land use planning is the province of local government in California. Each city and county is required to adopt a "general plan" that establishes goals and policies for long-term development, protection from environmental hazards, and conservation of identified natural resources. Typically, a general plan lays out the pattern of future residential, commercial, industrial, agricultural, open space, and recreational land uses within a community. Zoning, the primary means of implementing these plans, identifies the specific types of land uses that may be allowed on a given site. Zoning also establishes the standards that will be imposed on new development.

The fiber optic cable system will be installed within existing road, railroad, utility, or pipeline rights-of-way. As such, they will not be in conflict with local general plans. Construction of regenerator/OP-AMP stations may be subject to conditional use permits, but will not be subject to local general plans.

Local approaches to zoning vary considerably around the state. In general, zoning requirements are more restrictive along the coast than elsewhere. Zoning requirements are generally less restrictive in unincorporated portions of counties than in larger cities. The regenerator/OP-AMP station associated with the proposed project may be subject to zoning requirements in some jurisdictions. Williams is currently in the process of identifying local zoning and permit requirements and approvals.

Regulations, Approvals, and Permits Applicable to Land Use and Planning

Zoning regulations vary from jurisdiction to jurisdiction along the proposed routes. In some jurisdictions, construction is permitted "by right" (i.e., without the need for hearing) as an allowable use under the zoning ordinance. In others, a conditional use permit or similar discretionary action will be needed. Typically, discretionary actions require a noticed public hearing on the proposal. At the hearing, the local zoning board or zoning administrator would consider the proposal, public testimony, and the findings of a CEQA review.

If approved, the proposed project would be made subject to conditions relating to its design, appearance, and construction intended to comply with local ordinance and environmental quality requirements.

Proposed Project Route Settings

The proposed routes are described in the previous section on "Biological Resources." The routes traverse numerous cities and counties in California. Each of these jurisdictions has its own unique land use and zoning regulations and Williams is in the process of identifying those land use and zoning requirements applicable to the proposed project.

The California Desert Conservation Area Plan was adopted by the BLM to provide long-term policies for the management of BLM lands within the deserts of southeastern California. The plan addresses a wide range of issues pertinent to the goal of multiple use of public land and resources. These issues include archaeology and cultural resources, education, mineral recovery, recreation, rangeland, and wildlife.

X. MINERAL RESOURCES

Sand and gravel deposits are the minerals most likely to be found along all the project routes. Such deposits are typically found in streambeds and valley bottoms.

Regulations, Approvals, and Permits Applicable to Mineral Resources

Land use documents, including general plans and specific plans typically include policies that limit development of facilities in areas that contain mineral resources.

The California Surface Mining and Reclamation Act (SMARA) (Pub. Res. Code Section 2710 et seq.) establishes statewide mineral conservation policies that are implemented by counties and cities through local surface mining ordinances. The ordinances apply to surface mining operations and will not be applicable to the proposed project. Nonetheless, these policies discourage local governments from allowing new incompatible uses (essentially defined as permanent, urban uses) in areas identified by the state geologist as containing mineral resources that are either locally important or of statewide value.

The SMARA requires the state geologist to examine lands within California and classify them based on the availability of mineral deposits. Land may be classified as SZ (Scientific Resource area containing unique or rare occurrences of rocks, minerals, or fossils), MRZ-1 (Mineral Resource area where no significant mineral deposits are present), MRZ-2 (Mineral Resource area where significant mineral deposits exist and development should be controlled), MRZ-3 (Mineral Resource area where the significance of mineral deposits cannot be determined from available data), or MRZ-4 (Mineral Resource area where there is insufficient data to assign any other MRZ designation). The state geologist has undertaken mineral land classifications for only selected areas of California, based primarily on the potential for being converted to uses that are incompatible with mining. As a result, most of the comprehensive mapping has been done in urban areas.

The fiber optic conduit and cable will be installed within existing rights-of-way and will not involve excavations that would require SMARA. Because the lines will be installed within existing rights-of-way, they will not obstruct the recovery of mineral deposits to any greater extent than exists now. Regenerator/OP-AMP stations will not always be located within these rights-of-way. Under the provisions of the SMARA Policies and Procedures manual (California Division of Mines and Geology 1983), where land is classified as MRZ-3, before permitting a use that could threaten the potential to extract minerals, the local lead agency may require

an evaluation of the area to determine whether mineral deposits of statewide or areawide significance exist there.

Proposed Project Route Settings

Of those regenerator/OP-AMP sites identified in Chapter 3, only a portion have been mapped and classified.

Point Arena to Sacramento

This route has five regenerator/OP-AMP sites. No mineral land classification mapping has been done for these sites or their surrounding areas.

Sacramento to the California/Nevada Border

This route has three regenerator/OP-AMP sites. The Auburn site identified in Chapter 3 is classified as MRZ-3 (California Division of Mines and Geology 1983) by the state geologist. The Blue Canyon site is classified MRZ-3 on the mineral lands classification map for Placer County (California Division of Mines and Geology 1995). The area of the East Truckee site has not been mapped.

San Francisco to Santa Clara

There are no regenerator/OP-AMP sites proposed along this project route.

Pittsburg to Sacramento

This route has two regenerator/OP-AMP sites proposed. None of the areas surrounding these sites have been mapped.

San Luis Obispo to Bakersfield

This route has three regenerator/OP-AMP sites. The Shandon site is in an area that has not been mapped (California Division of Mines and Geology 1991). The Middle Station and McGarvey sites have been not been classified (California Division of Mines and Geology 1988).

San Luis Obispo to Los Osos Loop

There are no regenerator/OP-AMP sites proposed along this project route.

Riverside to California/Arizona Border

This route has five regenerator/OP-AMP sites. No mapping has been done for any of the areas surrounding the sites.

Los Angeles to Riverside

This route has one regenerator/OP-AMP site. The Pomona site is classified as MRZ-3 (California Division of Mines and Geology 1984).

Los Angeles to Anaheim

There are no regenerator/OP-AMP sites proposed along this project route.

XI. NOISE

Technical terms and acronyms used in this section may not be familiar to the reader. Explanations of these terms and background information on environmental acoustics and state and federal noise regulations are provided in **Appendix O**.

Residencies such as private homes, hospitals, and rest homes are typically considered to be sensitive to noise as are libraries and educational facilities. Threatened and endangered wildlife species are also considered to be noise sensitive in some cases. The number and type of noise sensitive uses along the project routes varies depending upon the degree of development in the area. In some areas, residences or other sensitive uses are located within 100 feet of the project routes. In other areas, the distance between the route and the nearest noise-sensitive uses is several thousand feet. However, because the project routes are primarily located within existing rights-of-way, any sensitive receptors are often already exposed to noise sources (i.e., railroad and roads).

Background noise levels along the project routes will also vary widely depending on the degree of development and general human activity in the area. For example, railroad and road rights-of-way will typically have greater background noise associated with trains and automobiles. Typical sources of noise include transportation (e.g., traffic, aircraft, train, watercraft), mechanical equipment (e.g., air conditioners, manufacturing equipment), and natural sources (e.g., wind, birds, crickets, frogs). Background sound levels typically range from 35 to 45 dBA (A-weighted decibels) in rural areas, 45 to 55 dBA in suburban areas, and 55 to 65 dBA in urban areas.

Regulations, Approvals, and Permits Applicable to Noise

California Government Code Section 65302(f) requires that city and county general plans include a noise element. The general plan noise element is used as a planning guideline to ensure that long-term noise generated by a source is compatible with adjacent land uses.

The California Department of Health Services (DHS) has studied the correlation of noise levels and their effects on various land uses and has published land use compatibility guidelines for the noise elements of local general plans (Office of Planning and Research 1990). The guidelines are the basis for most noise element land use compatibility guidelines in California. The DHS noise element guidelines identify the normally acceptable noise level range for several different land uses. Recommended maximum acceptable noise levels for various land uses are shown in **Table 4.XI-1**.

Table 4.XI-1. Maximum Allowable Ambient Noise Exposure for Various Land Uses

Land Use	Suggested Maximum Ldn*
Residential - low density	60
Residential - high density	65
Transient lodging	65
Schools, libraries, churches, hospitals	70
Auditoriums	70
Playgrounds, parks	70
Commercial	70
Industrial	75

Source: Office of Planning and Research 1990.
*Ldn - day-night level

As shown in **Table 4.XI-1**, low-density residential areas are most sensitive to noise intrusion with noise levels of 60 dBA Ldn and below considered acceptable. Acceptable noise levels are up to 70 Ldn for schools, libraries, churches, hospitals, and parks and up to 70 and 75 Ldn respectively for commercial and industrial land uses.

Cities and counties can also adopt noise control requirements within their zoning ordinances or as separate ordinances. Noise ordinances serve as an enforcement mechanisms for controlling noise. The level of specificity in noise ordinances used in California cities and counties vary widely. Many are based on the model noise ordinance published by DHS, which recommends daytime and nighttime noise level limits of 40 and 50 dBA-L_{50} respectively for rural uses, 45 and 55 dBA-L_{50} respectively for suburban uses, and 50 and 60 dBA-L_{50} respectively for urban uses. Noise ordinances often contain exemptions for construction activities, provided the construction takes place during the hours specified by affected local jurisdictions.

XII. POPULATION AND HOUSING

Implementation of the proposed project will not affect or generate additional population or affect or create the demand for new housing. No discussion of the setting for population and housing is necessary.

XIII. PUBLIC SERVICES

Public services are typically provided to development projects by a variety of local purveyors (i.e., city, county, special district, school district). The services available vary depending on the level of development in the area. The proposed project will require no public services; therefore, no discussion of the services setting is necessary.

XIV. RECREATION

Public recreation facilities are provided by cities, counties, and special districts. The types and intensity of facilities vary greatly. The proposed project is installation of a fiber optic cable system. Because the proposed project will be located within disturbed rights-of-way, the demand for recreational facilities will not be affected. No further discussion of the recreation setting is necessary.

XV. TRANSPORTATION/TRAFFIC

California is served by a well-developed network of freeways, highways, and surface streets, as well as mass transit facilities in the San Francisco Bay Area, and portions of the Los Angeles metropolis. The project routes pass through rural, suburban, and urban areas of the state. In suburban and urban settings, development tends to directly abut surface streets. The proposed rights-of-way are developed. In rural areas, the rights-of-way beyond the road pavement are generally undeveloped.

Certain routes (i.e., Point Arena to Sacramento, Sacramento to the California/Nevada border, Pittsburg to Sacramento, Riverside to the California/Arizona border, Los Angeles to Riverside, and Los Angeles to Anaheim) will follow railroad rights-of-way for part of their distance. These rights-of-way will provide convenient corridors for locating routes, without interfering with their ability to carry freight or passengers. As described in Chapter 2, the installation of fiber optic cable will be accomplished by plowing or trenching along one side of roadways or railroad tracks.

Regulations, Approvals, and Permits Applicable to Transportation/Traffic

The California Department of Transportation will require Williams to obtain an encroachment permit to perform construction activities in the state highway rights-of-way along the project routes. Some of the approximately 125 affected local agencies may require local encroachment permits or conditional-use permits for activities within public road rights-of-way. Encroachment permit requirements vary from agency to agency. As conditions of encroachment permits, measures are required to be implemented for transportation and traffic control. Williams is currently identifying all of the required encroachment permits.

Proposed Project Route Settings

Point Arena to Sacramento

The project route follows local roads and rural state highways (including SRs 1, 128, 175, 29, 20, 16, and 113) across the Coast Ranges and the Central Valley to Robbins. SR 128 links Cloverdale with the Coast. SRs 16 and 20 are important access routes to Lake County.

Sacramento to the California/Nevada Border

This route roughly parallels the Interstate 80 corridor over Donner Pass and into Sacramento. It is within the right-of-way of the UPRR from the Nevada state line to Truckee, where it switches to an existing AT&T telecommunications corridor. At Colfax, the route rejoins the UPRR right-of-way for the final descent into Sacramento. This rail line is the major east-west link for rail transport and passenger traffic originating in northern and central California.

San Francisco to Santa Clara

This route follows local streets and El Camino Real (SR 82) from San Bruno to Santa Clara. El Camino Real is a major commercial street providing local access to the communities of the San Francisco Peninsula.

Pittsburg to Sacramento

This route follows rural state highway (including SRs 160, 113, and 12), county road, and SPRR rights-of-way from Contra Costa County to Sacramento. Highway 160 is an important route for access to farmlands and small communities along the Sacramento River. Its Antioch bridge is the most westerly crossing of the San Joaquin River. The county roads serve primarily local traffic. The SPRR is the major rail transport and passenger line between Sacramento and the San Francisco Bay Area.

San Luis Obispo to Bakersfield

Major portions of this route will be inside existing ducts and idle pipelines. The western sections run within or adjacent to local streets in San Luis Obispo and U.S. Highway 101 over the Cuesta Grade. This limited access freeway is the primary north-south road connection for the central coast. From Atascadero to a point approximately 20 miles east of Bakersfield, the route is within a pipeline. It follows road and UPRR rights-of-way just east of the California Aqueduct to Bakersfield. These county and city roads provide local access.

San Luis Obispo to Los Osos Loop

This route follows local streets. Rural Los Osos Valley Road is the main link between the City of San Luis Obispo and the smaller Los Osos/Baywood Park community to the east.

Riverside to California/Arizona Border

This route is largely within the Kinder-Morgan Pipeline and railroad rights-of-way. The rail line provides the major east-west rail connection to the Riverside area from Arizona. The route will follow local streets in the vicinity of Riverside.

Los Angeles to Riverside

This route is almost exclusively within railroad rights-of-way. These rail lines provide the primary rail access to much of the Los Angeles basin's industrial areas.

Los Angeles to Anaheim

This route follows railroad and local road rights-of-way. As with the Los Angeles to Riverside route, the rail lines provide access to major industrial areas within the basin, including the cities of Cudahy, Commerce, and Vernon.

XVI. UTILITIES AND SERVICE SYSTEMS

Utilities are typically provided to development projects by a variety of local purveyors (i.e., city, county, special district, water agency, power company). The services available vary depending on the level of

development in an area. The proposed project will require no utilities other than electrical power for the regenerator and OP-AMP stations; therefore, no further discussion of the utilities and service systems setting is needed.

It will be necessary to contact "Dig Alert," "One-Call," or a similar underground utility contractor to determine the locations of subsurface utilities before construction. In areas along railroads, the railroad companies may require specific training before any activities can be performed within the railroad rights-of-way. All railroad companies will require coordination and notification of construction activities.