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BAY AREA

HABITAT CONSERVATION PLAN

OPERATIONS & MAINTENANCE

Prepared for:
Pacific Gas & Electric Company
Environmental Policy
77 Beale Street B28P
San Francisco, CA 94105
Contact: Glen Lubcke
415/973-1440

FINAL

PACIFIC GAS AND ELECTRIC COMPANY BAY AREA OPERATIONS & MAINTENANCE HABITAT CONSERVATION PLAN

PREPARED FOR:

Pacific Gas and Electric Company
Environmental Policy
77 Beale Street B28P
San Francisco, CA 94105
Contact: Glen Lubcke
415.973.1440

PREPARED BY:

ICF
630 K Street, Suite 400
Sacramento, CA 95814
Contact: Brad Norton
916.737.3000

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List of Acronyms and Abbreviations

AC	alternating current
AEA	automated environmental assessment
AMMs	avoidance and minimization measures
Annual Report	PG&E Bay Area O&M HCP Annual Report
applicator	Pest Control Business License holder
BA	biological assessment
Bay Area	San Francisco Bay Area
BLM	Bureau of Land Management
BMPs	best management practices
BO	biological opinion
BTU	British Thermal Units
CAISO	California Independent System Operator
Cal/OSHA	California Occupational Safety and Health Administration
Caltrans	California Department of Transportation
CALVEG	Classification and Assessment with Landsat of Visible Ecological Groupings
CCAAFMRA	California Chapter American Association of Farm Managers and Rural Appraisers
CDFW	California Department of Fish and Wildlife
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CPS	cathodic protection system
CPSI	Pipeline Safety Enhancement Program
CPUC	California Public Utilities Commission
CPUs	cathodic protection units
CRPR	California Rare Plant Rank
CWA	Clean Water Act
CWHR	California Wildlife Habitat Relationship
dbh	diameter breast height
Delta	Sacramento–San Joaquin River Delta
DOT	U.S. Department of Transportation
DPS	Distinct Population Segment
EA	environmental assessment

EAS	environmental action statement
East Contra Costa HCP/NCCP	East Contra Costa County Habitat Conservation Plan and Natural Community Conservation Plan
EIS	environmental impact statement
EO	element occurrences
EPA	U.S. Environmental Protection Agency
ESA	federal Endangered Species Act
ETS	Electric Test System
FAC	Facilities Design, Connections, and Maintenance
FERC	Federal Energy Regulatory Commission
FPs	field protocols
FRAP	Fire and Resource Assessment Program
G.O.	General Order
GGNRA	Golden Gate National Recreation Area
GIS	geographic information system
HCP	Habitat Conservation Plan
IS	Initial Study
ISO	Independent System Operator
kV	kilovolt
kW	kilowatt
kWh	kilowatt-hour
LOB	lines of business
LRAs	Local Responsibility Areas
MARS	mitigation accounting reporting system
MBTA	Migratory Bird Treaty Act
MBZ	map book zone
MFL	magnetic flux leakage
mph	miles per hour
NCCP	natural community conservation plan
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NHD	National Hydraulic Dataset
NMFS	National Marine Fisheries Service
NRC	Nuclear Regulatory Commission
NWR	National Wildlife Refuge
O&M	Operations & Maintenance
PAR	Property Analysis Record
PG&E	Pacific Gas and Electric Company
PLS	pressure limiting stations
psi	pounds per square inch
psig	pounds per square inch gauge

PVC	polyvinyl chloride
Regional Boards	Regional Water Quality Control Boards
ROW	right-of-way
RTC	Environmental Release to Construction
San Bruno Mountain HCP	San Bruno Mountain Area Habitat Conservation Plan
San Joaquin Valley O&M HCP	*San Joaquin Valley Operations and Maintenance Habitat Conservation Plan*
SCADA	supervisory control and data acquisition
SFEI	San Francisco Estuary Institute
SFPW	San Francisco Peninsula Watershed
Solano HCP	Solano Habitat Conservation Plan
sq. ft	square feet
SRAs	State Responsibility Areas
State Water Board	State Water Resources Control Board
SWPPP	stormwater pollution prevention plan
TSP	tubular steel poles
TVMP	Transmission Vegetation Management Plan
USACE	U.S. Army Corps of Engineers
USC	U.S. Government Code
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service

ES.1 Purpose and Background

Pacific Gas & Electric Company(PG&E) has prepared the attached multi-species Habitat Conservation Plan (HCP) for routine operation and maintenance (O&M) activities in the Bay Area region of its service area to comply with the federal Endangered Species Act (ESA) by applying for a Section 10(a)(1)(B) permit. The Bay Area O&M HCP is PG&E's second multi-species HCP designed to provide an efficient and consistent approach to both ESA compliance and long-term species conservation. PG&E's first HCP approved in 2008, the San Joaquin Valley O&M HCP, was the largest permitted O&M HCP for a utility company in California.

The purpose of the Bay Area O&M HCP is to enable PG&E to continue to conduct current and future O&M activities within the nine counties of the San Francisco Bay Area (Bay Area) while avoiding, minimizing, and mitigating for temporary and permanent impacts on threatened and endangered species habitat that could result from PG&E's ongoing O&M activities. This HCP supplements several PG&E programs that already protect or minimize potential impacts on covered species in the Bay Area. The HCP provides an analysis of impacts and potential for incidental take over the next 30 years.

ES.2 Plan Area, Covered Species and Activities

The geographic scope of the Bay Area O&M HCP includes Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Sonoma, and Solano Counties; collectively this area is known as the study area. Within those nine counties, the Plan Area consists of PG&E gas and electric transmission and distribution facilities, rights-of-way (ROW plus standard buffers), lands owned by PG&E and/or subject to PG&E easements, access routes, and mitigation areas acquired to mitigate for impacts resulting from covered activities. The total Plan Area encompasses approximately 402,440 acres. PG&E facilities in the Plan Area are located in urban (62%), natural (31.1%) and agricultural land-cover types (6.9%). In coordination with the USFWS, PG&E went through an iterative process of developing predictive habitat models for the covered species based on habitat requirements, species location information, and land-cover data. PG&E also used habitat models from regional conservation plans to validate the range and habitat for covered species.

The Bay Area HCP covers 18 wildlife and 13 plant species for 33 routine O&M activities for PG&E's electric and gas operations. These "covered species" are those which PG&E is seeking take authorization. Twelve covered species have designated critical habitat within the Plan Area. The HCP addresses impacts from day-to-day O&M activities as well as large maintenance improvement projects that require extensive planning and coordination and assumes that any activity could be implemented in a given year. The vast majority of O&M activities would affect less than 0.1 acre (approximately 66 feet by 66 feet), be regularly re-occurring, and take a couple of hours to complete. Small activities typically have short lead times whereas large activities or projects typically require multiple permits and authorizations, extensive coordination, and long lead times for materials. Typical activities include: gas pipeline protection, recoating, repair and replacement; electric line protection, repair, reconductoring, and replacement; electric pole repair/replacement; vegetation

management to maintain clearances around facilities; and minor new gas and electric extensions, as mandated for public safety and reliable energy.

ES.3 Habitat Disturbance and Species Effects

The temporary and permanent habitat disturbance associated with each covered activity and approximate amount of each land cover type disturbed are identified in the HCP. Impacts associated with covered activities were categorized as causing permanent habitat loss or temporary habitat loss. The time required for habitat functions and values to return is influenced by the type of habitat and disturbance. Physical disturbance to vernal pools, permanent wetlands, and seasonal wetland habitats could result in temporary or permanent impacts, depending on the time required to restore hydrological function. Permanent habitat loss results from disturbances causing permanent conversion from natural land cover suitable for a covered species to a developed land cover (i.e., a new footprint that results from new facilities that previously was not there, as is the case with minor new construction activities). Covered activities that could result in permanent habitat loss include, substation expansions, some vegetation management activities (e.g., ROW clearing), and construction of new permanent access roads where existing roads cannot be utilized or restored. Temporary habitat loss is attributed to covered activities that involve excavation, grading, or stockpiling of soil that alters existing vegetation, soils, topography, and hydrology for a period of days, weeks, or months, but no longer than twelve months. Temporary impacts also can result from equipment staging. While these disturbances may have an impact on habitat values for covered species, impacts on habitat are temporary in nature (less than 1 year) and allow habitat functions and values to return within that year.

ES.4 Elements of the Conservation Strategy

Five key principles guide PG&E's Bay Area O&M HCP conservation strategy.

1. The avoidance and minimization of impacts is ensured by a thorough review of covered activities via environmental impact review, planning, and screening.
2. Avoiding impacts on habitat (i.e., implementing avoidance and minimization measures [AMMs] and best management practices [BMPs]) is preferable to mitigating or preserving habitat offsite.
3. Preserving lands for covered species with high-quality habitat or of high conservation value helps to build on other local and regional conservation efforts.
4. Preserving large, contiguous areas of habitat is preferable to preserving a larger number of small areas.
5. Habitat mitigation lands will be protected and managed in perpetuity.

PG&E will provide annual HCP training for staff and third-party contractors working under the requirements of the HCP. Training will include an overview of the Bay Area O&M HCP, the importance of compliance with the HCP and all environmental laws, and a summary of all AMMs and BMPs outlined in the HCP.

The primary objective of the strategy is to avoid, minimize, and mitigate impacts on covered species and habitat in the Plan Area. PG&E conducts early planning and review of activities to avoid or

minimize impacts on species and their habitat for those species. To avoid and minimize the impacts of its activities, PG&E often redesigns or reconfigures construction plans in consultation with PG&E biologists and land planners by taking the following actions: adjusting or changing access routes, relocating or modifying work areas, minimizing the size of work sites, modifying work practices, and/or adjusting or changing work periods.

PG&E's team of land planners and biologists will conduct site assessments, and will employ biologists to determine the need for additional surveys, monitoring, and/or site-specific AMMs. For small covered activities, affecting less than 0.1 acre, a predictive modeled habitat approach provides an alternative to on-the-ground biological surveys for species occurrence and habitat suitability. Habitat models utilize existing commercial data and biological information to assess the likelihood that a covered species or its habitat is present at a particular location. For large covered activities, affecting more than 0.1 acre, PG&E land planners and biologists will review and utilize the modeled habitat information, and will use actual, on-the-ground impacts as measured in the field by biologists and land planners to determine the extent of permanent or temporary impacts on habitat.

PG&E will employ a suite of measures to avoid and minimize the impacts on covered species and habitat resulting from covered activities. AMMs are proposed to avoid and minimize effects. PG&E will consistently implement measures when activities are conducted in sensitive areas. There are AMMs specific to hot zones[1], Species-Specific AMMs, and Covered Plant AMMs that will ensure impacts on narrow endemic species are avoided or minimized; each measure focuses on a particular species or suite of species and will be applied when PG&E undertakes covered activities in a specific area.

Other principles of the strategy include identifying high-value conservation opportunities, acquiring larger mitigation parcels contiguous to protected areas and other nonprotected areas of suitable habitat, and seeking strategic partnerships with local conservation organizations that are actively involved in habitat enhancement and restoration with the goal of species conservation or recovery. PG&E will provide habitat mitigation lands either in advance or at the time of covered activity impacts over the term of the HCP.

ES.5 Mitigation and Funding

To offset potential effects, PG&E will provide habitat mitigation through the following mechanisms: purchase of high-quality habitat, purchase or placement of conservation easements, purchase of credits from approved mitigation or conservation banks, partnerships with and/or contributions to existing conservation planning and recovery efforts, placement of conservation easements on existing PG&E lands, implementation of and contributions to recovery plan strategies, and habitat enhancement and restoration on lands already protected.

Temporary effects will be mitigated at a ratio of 0.5:1 or 1:1, depending on the species and timing of the mitigation, and permanent effects will be mitigated at a ratio of 3:1. PG&E will provide habitat mitigation in advance of impacts on covered species. PG&E will base its mitigation on acreages of estimated and actual habitat losses, and will adjust the timing of acquisitions based on forecasted habitat impacts and the amount of mitigation that has previously been implemented. For many

[1] Hot zones are defined as areas containing a known localized population of covered species with a small and well-defined range, and where species would most likely be affected should covered activities occur there.

covered species, particularly broadly distributed species, the mitigation will be provided early in the permit term. For other species, mitigation amounts may be acquired in advance of impacts in 5-year or 10-year increments, depending on the species, the size of the mitigation requirement, the availability of mitigation lands, the potential for covered activities to impact covered species, and other variables. PG&E proposes to acquire conservation lands during HCP development that will count towards compliance requirements when the HCP permit is issued. The cost of implementing the HCP is approximately $124.1 million over the next 30 years, adjusted for inflation. This includes implementation and training costs, mitigation costs, and program development costs.

ES.6 Other Key Components of the HCP

The HCP also includes information on how PG&E will staff, implement, monitor and report on its covered activities and information on program costs, funding, and funding assurances. It describes the regulatory assurances being sought, changed and unforeseen circumstances, and conditions for permit renewal and amendments. The HCP also includes the alternatives to the proposed Bay Area O&M HCP that were evaluated and rejected.

Chapter 1
Introduction

*[**Summary**: This chapter presents the background, purpose, and regulatory framework for Pacific Gas and Electric Company's (PG&E's) Bay Area Operations & Maintenance (O&M) Habitat Conservation Plan (HCP). It also describes PG&E's overall environmental review and screening process. The Bay Area O&M HCP addresses impacts from day-to-day operation and maintenance activities as well as large maintenance projects that require extensive planning and coordination. The geographic scope of PG&E's Bay Area O&M HCP study area includes the nine California counties that surround San Francisco Bay: Marin, Sonoma, Napa, Solano, Contra Costa, Alameda, Santa Clara, San Mateo, and San Francisco. The Plan Area is a subset of the study area and consists of PG&E gas and electric transmission and distribution facilities plus right of ways (ROWs), the lands owned by PG&E and/or subject to PG&E easements to maintain these facilities, private access routes associated with PG&E's routine maintenance, a buffer around the ROWs, and mitigation areas acquired to mitigate for impacts resulting from covered activities. The Plan Area encompasses approximately 402,440 acres. Within the Plan Area, approximately 128,735 acres are in natural land-cover types, many of which support endangered or threatened species habitat. PG&E built the analysis contained herein on a foundation of modeled habitat developed in other regional conservation plans throughout the Bay Area. PG&E is proposing to seek incidental take authorization for 33 routine O&M, minor new construction, and Community Pipeline Safety Initiative (CPSI) activities for its electric and gas transmission and distribution systems affecting 18 covered wildlife and 13 plant species.]*

1.1 Background

PG&E is the largest investor-owned electric and gas utility in the United States, serving more than 5.4 million electricity customers and 4.3 million natural gas customers, and employing more than 21,000 people. PG&E's service area stretches from Eureka in the north to Bakersfield in the south and from the Pacific Ocean in the west to the Sierra Nevada in the east, overall encompassing approximately 70,000 square miles in 48 of California's 58 counties. Nearly 11% of PG&E's total service area lies within the following nine counties of the San Francisco Bay Area (Bay Area): Marin, Sonoma, Napa, Solano, Contra Costa, Alameda, Santa Clara, San Mateo, and San Francisco. These counties are the *study area* for the Bay Area O&M HCP (Figure 1-1).

PG&E's electric and gas transmission and distribution infrastructure, the majority of which was installed between 1950 and 1970, requires continued long-term O&M, minor new construction, and CPSI activities to continue to deliver reliable and safe energy to PG&E customers. Over the past few years and into the future, PG&E has been and will continue to be making a concerted effort to upgrade key existing gas transmission pipelines in heavily populated and other critical areas. The focus of the CPSI effort specifically is to inspect, field-test, and potentially replace pipeline segments to ensure that they meet current standards for the reliable and safe delivery of gas to customers.

As the U.S. Fish and Wildlife Service (USFWS) continues to list wildlife and plant species as threatened or endangered under the federal Endangered Species Act (ESA), PG&E developed this comprehensive conservation program to avoid, minimize, and mitigate impacts on listed species while also receiving take authorization for its endangered species compliance needs.

The *PG&E San Joaquin Valley Operations and Maintenance Habitat Conservation Plan* (San Joaquin Valley O&M HCP) was the first plan developed and approved for PG&E. The USFWS and the California Department of Fish and Wildlife (CDFW) issued permits for the San Joaquin Valley O&M HCP in December 2007 and June 2008, respectively. For this O&M HCP, PG&E is working with the USFWS. PG&E is also working separately with CDFW on an incidental take permit under California Fish and Game Code Section 2081(b). An additional O&M HCP may be sought for the Sacramento Valley.

This document aims to build upon the San Joaquin Valley O&M HCP by presenting a comprehensive conservation strategy for PG&E's gas and electric transmission and distribution system O&M activities within the nine Bay Area counties serviced by PG&E. PG&E is asking the USFWS to issue a permit that authorizes the incidental take of covered species. A permit authorized for the Bay Area O&M HCP would enable PG&E to continue current and future O&M activities in the Bay Area, while avoiding, minimizing, and mitigating direct, indirect, and cumulative impacts on threatened and endangered species that could result from such activities.

1.2 Purpose

The overall purpose of PG&E's Bay Area O&M HCP is to develop and implement a conservation plan to achieve the following purposes.

- Avoid, minimize, and mitigate temporary and permanent impacts on threatened and endangered species resulting from PG&E's O&M, minor new construction, and CPSI activities in the Bay Area.
- Provide the basis for incidental take authorization pursuant to the ESA for PG&E's current and future O&M activities, minor new construction, and CPSI activities in the Bay Area.

The PG&E O&M HCP is different from most other habitat conservation plans in that it shifts the habitat conservation plan paradigm from one-time use (i.e., standard development projects) and permanent habitat impacts, to infrequent and dispersed permanent and temporary impacts that occur at or near existing facilities during infrastructure maintenance. Generally, O&M activities result in temporary impacts on proposed covered species. This O&M approach includes a programmatic strategy for infrastructure maintenance and long-term commitments for sensitive species and habitat protection over 30 years.

1.3 Overview of Pacific Gas and Electric Company

PG&E provides natural gas and electricity to customers throughout the Bay Area. A summary of PG&E's natural gas and electricity systems follows.

1.3.1 Natural Gas System

Natural gas is initially captured in a well where pressure helps the gas rise to the surface naturally. The gas is then processed at plants, sent through a compressor station to increase pressure, and then moved to an underground storage facility or network of (primarily underground) transmission lines. Throughout the gas system, regulator stations maintain the pressure of the gas as it travels through the transmission pipelines. Safety valve monitors are also installed along the gas system to

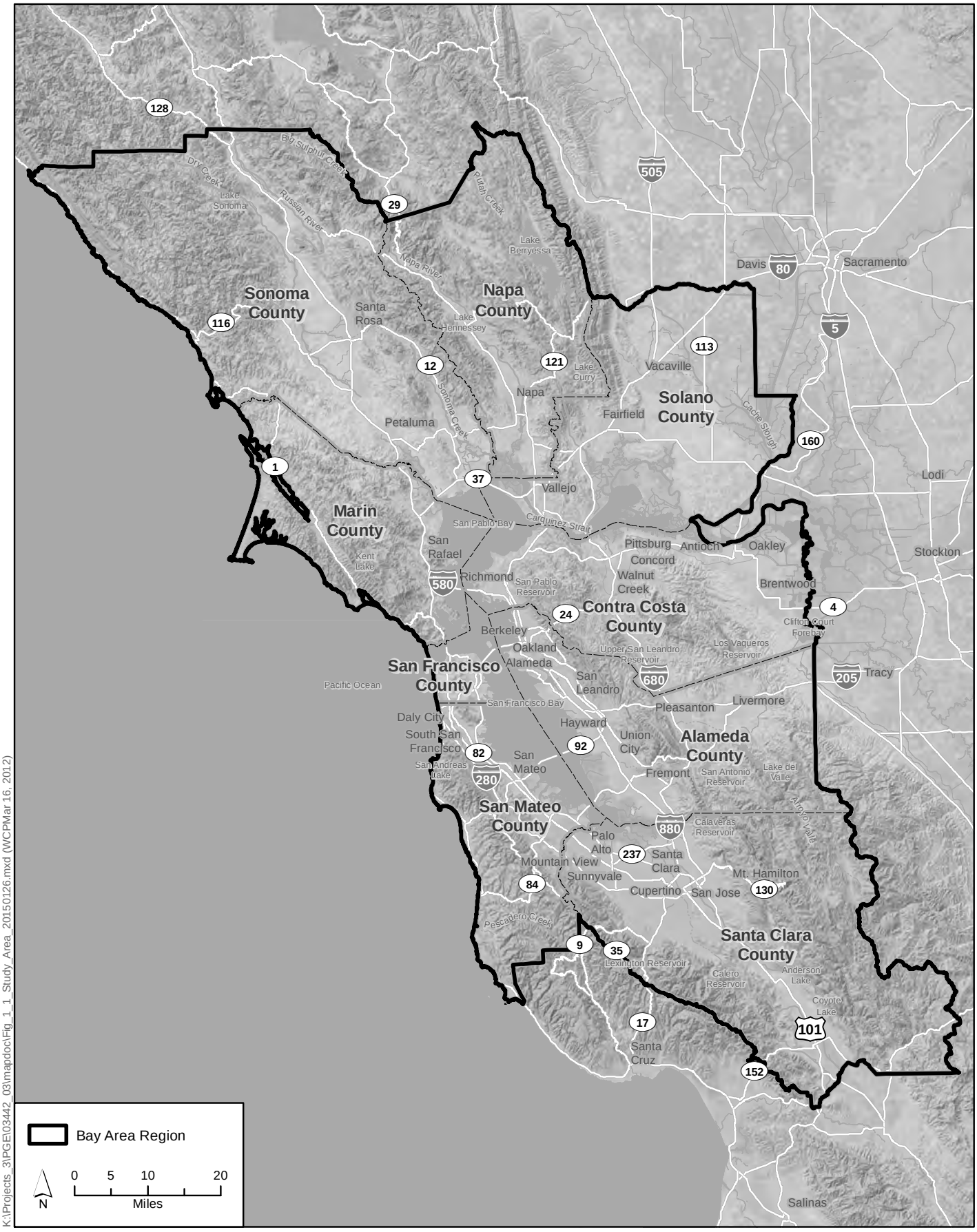

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Figure 1-1
Study Area

ensure the regulator station is accurately maintaining the gas pressure. These monitors are designed to reduce pressure quickly if the gas exceeds specified limits. Before gas enters the distribution system that distributes gas from the regulator stations to customers, the pressure is reduced from transmission levels to distribution levels. PG&E monitors and adjusts pressure and flow rate as needed at gas pressure limiting stations.

Statewide, PG&E maintains more than 6,400 miles of high-pressure gas transmission pipelines, 59 compressors at 17 stations, and more than 42,000 miles of gas distribution pipelines. In the Bay Area, PG&E owns 1 compressor station (Bethany compressor station in eastern Alameda County), 1,820 miles of gas transmission pipelines, and 19,350 miles of gas distribution pipelines.

1.3.2 Electric System

PG&E acquires a diverse mix of electric power generation from hydroelectric, nuclear, natural gas, solar, wind, and geothermal sources from over 400 plants owned by independent power producers or qualified facilities for resale to its customers. PG&E's role in, and responsibilities related to, the transmission and distribution of electric energy is not anticipated to change. Electric energy is carried over the bulk electric grid, a "network" of high-voltage transmission lines that transport power from power plants to switching stations or substations, where power is redirected and transformed to lower voltages. PG&E substations are critical junctions and switching points in the electric system, connecting the transmission system to the distribution system. Substations use transformers to lower the voltage of electric energy before it is sent to the distribution lines and on to customers. The distribution system includes main or "primary" lines and lower voltage or "secondary" lines, which deliver electric energy either overhead or underground; distribution transformers, which lower voltage to usage levels; and switching equipment to permit the lines to be connected together in various combinations and patterns. Individual services then connect the distribution system to the customer. The transmission lines operate at 500, 230, 115, 70, or 60 kilovolts (kV) and may be constructed on steel towers, steel poles, or wooden poles. The switching stations and substations transform the electric energy down to 21 or 12 kV for the distribution system. The distribution lines are installed either underground or on the overhead wooden poles typically found along highways and streets. Pole-mounted transformers further reduce the voltage to 110/220 volts for normal household use.

Statewide, the PG&E system comprises about 18,600 miles of interconnected transmission lines, about 141,215 miles of distribution lines, and 1,014 substations. In the Bay Area, PG&E owns, operates and maintains approximately 4,430 miles of transmission lines, 23,015 miles of distribution lines, and 207 substations.

1.4 Regulatory Context

As a public utility, PG&E is regulated by the state and federal agencies listed below.

- **California Public Utilities Commission (CPUC)**: As the primary regulating agency, the CPUC establishes gas and retail electric rates, approves major construction projects, and provides general oversight of utility facility O&M programs and financial/accounting practices.
- **Independent System Operator (ISO)**: The ISO is responsible for ensuring a safe and reliable electric system in California.

- **California Energy Commission (CEC)**: The CEC is responsible for long-term energy forecasting, energy-planning programs, and certification of thermal powered electric generation plants.
- **Federal Energy Regulatory Commission (FERC)**: FERC regulates bulk electric sales and the licensing of hydroelectric projects. (PG&E has no hydroelectric facilities in the Bay Area.)
- **North American Electric Reliability Corporation (NERC)**: NERC is certified by FERC to establish, monitor, and enforce compliance with reliability standards for the bulk-power system.
- **Nuclear Regulatory Commission (NRC)**: The NRC monitors PG&E's Diablo Canyon and Humboldt Bay Power Plants. (PG&E's Diablo Canyon and Humboldt Bay Power Plants are located outside the Bay Area, and the Humboldt Bay Power Plant is not operational.)
- **U.S. Department of Transportation (DOT)**: The DOT Office of Pipeline Safety issues regulations addressing the construction, operation, and maintenance of natural gas pipeline and compressor stations.

In addition to the utility-specific regulatory structure listed above, PG&E's activities are subject to state and federal wildlife laws and regulations, as described below.

1.4.1 Federal Endangered Species Laws

The Bay Area O&M HCP is designed primarily to comply with Section 10(a)(1)(B) of the ESA. It is also consistent with other federal and state wildlife laws and regulations. Relevant laws and regulations are described below.

1.4.1.1 Federal Endangered Species Act

In 1973, the federal government's decade-long effort to address the challenge of protecting endangered species culminated in passage of the third rendition of the ESA. Congress intended to improve upon previous protective regulations by creating a more comprehensive approach that would protect not only individual species but also their habitats. For the first time, the ESA stated the intention of conserving the ecosystems on which endangered and threatened species depend, with a goal of restoring listed species to a demographic condition that would render the protections of the ESA unnecessary.

USFWS and the National Marine Fisheries Service (NMFS) administer ESA. The ESA requires USFWS and NMFS to maintain lists of threatened and endangered species and provides substantial protections for listed species. NMFS's jurisdiction under the ESA is limited to the protection of marine mammals, marine fish, anadromous fish, corals, and some listed plants; all other species, including freshwater fish, are subject to USFWS jurisdiction.

Section 9 of the ESA prohibits the take of any fish or wildlife species listed under the ESA as endangered and most species listed as threatened. *Take*, as defined by the ESA, means "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." *Harass* is defined as the intentional or negligent actions that create the likelihood of injury to listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns, which include, but are not limited to, breeding, feeding, and sheltering. *Harm* is defined by regulation as "any act that kills or injures the species, including significant habitat modification." All or some forms of take of threatened species are prohibited by regulation at the time of listing.

Exceptions to these prohibitions on take are addressed in Section 7 (for federal actions) and Section 10 (for nonfederal actions) of the ESA as described below.

Section 7

Section 7 of the ESA requires federal agencies to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of habitat critical to such species' survival. To ensure that its actions do not result in jeopardy to listed species or adverse modification of critical habitat, each federal agency must consult with USFWS and/or NMFS regarding federal agency actions. The consultation is initiated when the federal agency submits to USFWS and/or NMFS a written request for initiation of consultation, along with the agency's biological assessment (BA) of its proposed action. If USFWS and/or NMFS conclude that the action is not likely to adversely affect a listed species or its designated critical habitat, the action may be carried forward without further review under the ESA. Otherwise, USFWS and/or NMFS must prepare a written biological opinion (BO) describing how the agency's action would affect the listed species and its critical habitat.

If the BO concludes that the proposed action would jeopardize the continued existence of a listed species or cause the destruction or adverse modification of its critical habitat, the opinion must suggest "reasonable and prudent alternatives" that would avoid that result. If the BO concludes that the action as proposed would involve the take of a listed species, but not to an extent that would jeopardize the species' continued existence, the BO must include an *incidental take statement*. The incidental take statement must specify an amount of take that may occur as a result of the action and suggest reasonable and prudent measures to minimize the impact of the take. If the action complies with the BO and incidental take statement, it may be implemented without violation of the ESA, even if incidental take occurs.

While the Bay Area O&M HCP constitutes a nonfederal project and, accordingly, must use the exemption provided by Section 10 (described below), the permitting of the plan itself is considered a federal action. This permitting process triggers an internal consultation whereby USFWS must prepare BOs that address those actions permitted by the Bay Area O&M HCP and their impacts on listed species and critical habitat.

Section 10

Until 1982, nonfederal entities had no means to acquire an exception similar to the incidental take authorization promulgated under Section 7. Private landowners and state agencies risked being in direct violation of the ESA no matter how carefully their projects were implemented. This statutory dilemma led Congress to amend Section 10 of the ESA in 1982 to authorize the issuance of an incidental take permit to a nonfederal project proponent upon completion of an approved conservation plan (now called a habitat conservation plan or HCP).

In cases where federal land, funding, or authorization is not required for an action by a nonfederal entity, the take of listed species must be permitted by USFWS and/or NMFS through the Section 10 process. Private landowners, corporations, state agencies, local agencies, and other nonfederal entities must obtain a Section 10(a)(1)(B) incidental take permit for take of federally listed fish and wildlife species that is "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." Because the ESA Section 9 prohibitions for listed plants apply only on lands under federal jurisdiction, Section 10 incidental take permits are necessary only for take of wildlife and fish

species. Nonetheless, plants often are included in habitat conservation plans such that USFWS can make findings of no-jeopardy when the Section 7 process is triggered.

To receive an incidental take permit, the nonfederal entity is required under Section 10(a)(2)(A) to prepare a habitat conservation plan that must include the following information.

- Impacts likely to result from the proposed taking of the species for which permit coverage is requested.
- Measures that will be implemented to monitor, minimize, and mitigate impacts.
- Funding that will be made available to undertake such measures.
- Procedures to deal with unforeseen circumstances.
- Alternative actions considered that would not result in take.
- Additional measures USFWS may require as necessary or appropriate for purposes of the plan.

As mentioned above, issuance of an incidental take permit is a federal action and, as such, is subject to Section 7 consultation. Accordingly, prior to the approval of a habitat conservation plan, USFWS and/or NMFS is required to undertake an internal Section 7 consultation. The agencies examine the habitat conservation plan to ensure that it accurately documents the expected impacts of their federal action (i.e., issuance of a take permit) as well as the mitigation proposed to offset those impacts.

To meet the requirements of Section 7, elements specific to the Section 7 process (e.g., analysis of impacts on designated critical habitat, analysis of impacts on listed plant species, and analysis of indirect and cumulative impacts on listed species) are included in the Bay Area O&M HCP.

1.4.1.2 California Endangered Species Act

CESA protects wildlife and plants listed as threatened and endangered by the California Fish and Game Commission. CESA prohibits the take of state-listed wildlife and plants and requires a permit for authorization of incidental take. Section 86 of the California Fish and Game Code defines *take* as any action or attempt to "hunt, pursue, catch, capture, or kill."

CDFW may authorize, by permit, the take of endangered, threatened, and candidate species if all of the following conditions are met: (1) The take is incidental to an otherwise lawful activity; (2) the impacts of the authorized take shall be minimized and fully mitigated, the measures required to meet this obligation are roughly proportional in extent to the impact, and all required measures are capable of successful implementation; (3) the permit is consistent with regulations adopted pursuant to California Fish and Game Code Sections 2112 and 2114; (4) the applicant ensures adequate funding to implement the measures and for monitoring compliance with, and effectiveness of, those measures; and (5) issuance of the permit would not jeopardize the continued existence of the species. PG&E issues annual financial assurances that the company is solvent and able to adequately fund, implement, and monitor the avoidance and minimization measures (AMMs) for compliance, implement the requirements of the incidental take permits, and provide for the long-term endowments. The requirements of an application for an incidental take permit under CESA are described in Section 2081 of the California Fish and Game Code and in final adopted regulations for implementing Sections 2080 and 2081 (California Code of Regulations, Title 14, Section 783).

PG&E will apply for a Section 2081 permit for those state-listed species for which CDFW may authorize incidental take. While PG&E is committed to the protection of rare plants and will continue to work to avoid and minimize its impacts to them, PG&E is also exempt from the provisions of the state endangered and native plant protection requirements under Section 1913(b) of Fish and Game Code. The Native Plant Protection Act of 1973 (Fish and Game Code Sections 1900–1913) includes provisions that prohibit the taking of endangered or rare native plants. CDFW administers the Native Plant Protection Act of 1973 and generally regards as rare many plant species included on California Rare Plant Rank (CRPR) 1A, 1B, 2A, and 2B of the CNPS Inventory of Rare and Endangered Vascular Plants of California. In addition, sometimes CRPR 3 and 4 plants are considered if the population has local significance in the area and is impacted by the project. Section 1913(b) includes a specific provision to allow for the incidental removal of endangered or rare plant species, if not otherwise salvaged by CDFW, within a right-of-way to allow a public utility to fulfill its obligation to provide service to the public.

Incidental take of state-listed species also can be authorized under the Natural Community Conservation Planning Act (Sections 2800–2835). PG&E is not preparing a natural community conservation plan (NCCP) because, among other reasons, it owns less than 1% of the land where PG&E's covered activities would take place.

1.4.2 Other Federal and State Wildlife Regulations

PG&E activities are regulated by other federal and state wildlife regulations in addition to the ESA and CESA, including the federal Migratory Bird Treaty Act (MBTA), California Fish and Game Code for fully protected species, and California Fish and Game Code for the protection of birds and their nests.

1.4.2.1 Migratory Bird Treaty Act

The MBTA implements various treaties and conventions among the U.S. and Canada, Japan, Mexico, and the former Soviet Union for the protection of migratory birds. Under the MBTA, taking of, killing, or possessing migratory birds is unlawful, as is taking of any parts, nests, or eggs of such birds (16 U.S. Government Code [USC] 703).

For those species that are listed as threatened or endangered under the ESA and also protected by the MBTA, USFWS has issued guidelines (Appendix 5, "FWS Guidance on Addressing Migratory Birds and Eagles," of the *Habitat Conservation Planning and Incidental Take Permit Processing Handbook* [1996]) on complying with both statutes. Pursuant to USFWS guidance, the habitat conservation plan incidental take permit also constitutes a special purpose permit under 50 Code of Federal Regulations (CFR) Section 21.27 for the take of migratory birds listed on the permit that are also listed under the ESA. The definition of *take* under the MBTA is different from that under the ESA; *take* under the MBTA means to "pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect." There is no incidental take allowed under the MBTA.

1.4.2.2 California Fish and Game Code for Fully Protected Species

Fully protected species are those species for which take is not permitted except in cases where collection of these species are needed for scientific research, bird species relocation for the protection of livestock, or in the context of recovery actions associated with an approved NCCP, if

the fully protected species is a covered species under the NCCP. Fully protected species for which the CDFW may not authorize take, except under the three scenarios mentioned above, are described in Sections 3511 (fully protected birds), 4700 (fully protected mammals), 5050 (fully protected reptiles and amphibians), and 5515 (fully protected fish) of the California Fish and Game Code. These protections state, "No provision of this code or any other law shall be construed to authorize the issuance of permits or licenses to take any fully protected [bird], [mammal], [reptile or amphibian], [fish]."

1.4.2.3 California Fish and Game Code for Protection of Birds and Their Nests

Section 3503.5 of the Fish and Game Code prohibits the take, possession, or destruction of any birds of prey or their nests or eggs. Likewise, Section 3503 provides, "It is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any other regulation made pursuant thereto." CDFW is currently in the process of updating its nest regulations.

1.4.3 Federal and State Water and Wetland Laws and Regulations

In addition to the species-specific laws and regulations noted above, PG&E's covered activities are subject to federal and state laws and regulations concerning potential impacts on water bodies, as described below.

1.4.3.1 Clean Water Act and Porter-Cologne Water Quality Control Act

Clean Water Act Section 404

The U.S. Environmental Protection Agency (EPA) has delegated the authority to issue permits under the federal Clean Water Act (CWA) to the U.S. Army Corps of Engineers (USACE). The CWA is the primary federal law that protects the quality of the nation's surface waters, including lakes, rivers, and coastal areas. The CWA regulates discharges into the nation's waters, making unlawful any discharge not specifically authorized by a permit; issuance of such permits constitutes the CWA's principal regulatory tool.

Section 404 of the CWA regulates the discharge of dredged or fill material into waters of the United States, including wetlands. Under Section 404, USACE is responsible for permitting this process. USACE issues two types of permits under Section 404: general permits (either nationwide permits or regional permits) and standard permits (either letters of permission or individual permits). General permits are issued by USACE to streamline the Section 404 process for nationwide, statewide, or regional activities that have minimal direct or cumulative environmental impacts on the aquatic environment. Standard permits are issued for activities that do not qualify for a general permit (i.e., that may have more than a minimal adverse environmental impact).

The Bay Area O&M HCP would not provide authorization to fill waters of the United States under Section 404 of the CWA. However, it is expected that as a result of the Bay Area O&M HCP, Section 404 permitting for covered activities would be streamlined. PG&E is contemplating the development of a regional general permit and may pursue this over the next several years. The internal USFWS consultation and associated Section 7 BO issued for the Bay Area O&M HCP would serve as the basis

for any future BOs in the study area for PG&E's covered activities. Compliance with the ESA is required prior to issuance of CWA Section 404 permits.

Clean Water Act Section 401

Under CWA Section 401, states have the authority to certify federal permits for discharges to waters under state jurisdiction. States may review proposed federal permits (e.g., Section 404 permits) for compliance with state water quality standards. The permit cannot be issued if the state denies certification. In California, the State Water Resources Control Board (State Water Board) and the Regional Water Quality Control Boards (usually referred to as the Regional Boards) are responsible for the issuance of Section 401 certifications.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act (codified in the California Water Code, Section 13000 et seq.) is the primary state law concerning water quality. It authorizes the State Water Board and Regional Boards to prepare management plans such as regional water quality plans to address the quality of groundwater and surface water. The Porter-Cologne Water Quality Control Act also authorizes the Regional Boards to issue waste discharge requirements defining limitations on allowable discharge to waters of the state.[1] In addition to issuing Section 401 certifications on Section 404 applications to fill waters, the Regional Boards may issue waste discharge requirements for such activities. Because the authority for waste discharge requirements is derived from the Porter-Cologne Water Quality Control Act and not the CWA, waste discharge requirements may apply to a somewhat different range of aquatic resources than do Section 404 permits and Section 401 water quality certifications. Applicants that obtain a permit from USACE under Section 404 also must obtain certification of that permit by the appropriate Regional Board.

The Bay Area O&M HCP does not include certifications under Section 401 or waste discharge permits under the Porter-Cologne Water Quality Control Act. These authorizations, when needed, would be obtained separately for each activity. However, PG&E expects the permitting process will be streamlined with respect to satisfying compliance with the ESA once the Bay Area O&M HCP is being implemented.

1.4.3.2 California Department of Fish and Game Lake and Streambed Alteration Program

CDFW regulates work that could substantially affect resources associated with rivers, streams, and lakes in California, pursuant to Fish and Game Code Sections 1600–1616. An entity, defined as any person, state, or local governmental agency or public utility, must notify CDFW of any work that will substantially divert or obstruct the natural flow of—or substantially change or use any material from the bed, channel, or bank of—any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake.

PG&E will evaluate its activities to determine if the activity may substantially adversely affect an existing fish or wildlife resource, and, if so, will submit a notification to CDFW to enter into a Lake or Streambed Alteration Agreement. The agreement includes reasonable measures necessary to

[1] *Waters of the state* are defined in the Porter-Cologne Act as "any surface water or groundwater, including saline waters, within the boundaries of the state" (California Water Code, Section 13050[e]).

protect the resource and the entity conducts the activity in accordance with the agreement. Because CDFW includes under its jurisdiction streamside habitats that may not qualify as wetlands under the CWA definition, CDFW jurisdiction may be broader than USACE jurisdiction.

1.4.4 Federal and State Environmental Acts

Issuance of an incidental take permit by USFWS under the ESA Section 10 constitutes a federal action that requires compliance with the National Environmental Policy Act (NEPA). Similarly, CDFW's issuance of an incidental take permit under CESA, specifically Fish and Game Code Section 2081, or a Streambed Alteration Agreement under Fish and Game Code Section 1602 constitutes a state action that requires compliance with the California Environmental Quality Act (CEQA).

1.4.4.1 National Environmental Policy Act

NEPA requires federal agencies to include in their decision-making process appropriate and careful consideration of environmental impacts of a proposed action and of possible alternatives. Documentation of the environmental impact analysis and efforts to avoid or minimize the adverse impacts of proposed actions must be made available for public notice and review. This analysis is documented in either an environmental action statement (EAS), environmental assessment (EA), or an environmental impact statement (EIS).

To satisfy NEPA requirements, USFWS will prepare one of these 3 documents for PG&E's Bay Area O&M HCP.

1.4.4.2 California Environmental Quality Act

CEQA is similar to but more extensive than NEPA in that NEPA's goal is to develop and maintain a high-quality environment now and in the future, while CEQA also requires California's public agencies to identify the significant environmental impacts of their actions and either avoid those significant environmental impacts through adoption of AMMs or mitigate project impacts to a less-than-significant level unless overriding considerations are identified. As the lead agency under CEQA, CDFW will prepare an Initial Study (IS) or an EIR for the issuance of a 2081 Incidental Take application.

1.4.5 Relationship to Other Planning Efforts

The Bay Area O&M HCP incorporates relevant data and information from other conservation planning efforts, such as regional HCPs and NCCPs, recovery plans, other regional planning efforts, and mitigation/conservation banking opportunities. PG&E used data from the following plans and planning efforts.

- *East Contra Costa County Habitat Conservation Plan and Natural Community Conservation Plan* (East Contra Costa HCP/NCCP) (East Contra Costa County Habitat Conservation Plan Association 2006)
- *Santa Clara Valley Habitat Plan* (City of Gilroy et al. 2012)
- *Solano Habitat Conservation Plan* (Solano HCP) (Solano County Water Agency 2012)
- *East Alameda County Conservation Strategy* (East Alameda County Conservation Strategy Steering Committee 2010).

- *Santa Rosa Plain Conservation Strategy* (U.S. Fish and Wildlife Service 2005a)
- *San Bruno Mountain Area Habitat Conservation Plan* (San Bruno Mountain HCP) (San Bruno Mountain Habitat Conservation Plan Steering Committee 1982).
- Regional mitigation/conservation banks and their service areas

Where data gaps existed, PG&E modeled habitat and utilized a similar analysis and approach as used in the above conservation planning efforts.

USFWS has prepared recovery plans for several of the special-status species covered by the Bay Area O&M HCP. These recovery plans were utilized in the conservation planning process and were integrated into the species accounts presented in Appendix B, *Species Accounts*. PG&E also considered watershed management plans, park plans, restoration plans (e.g., South Bay salt-marsh restoration efforts), and large-scale conservation efforts (e.g., Conservation Lands Network).

1.5 Overview of the Habitat Conservation Plan Process

The Bay Area O&M HCP addresses PG&E's routine O&M, minor new construction, and CPSI activities in the nine counties of the Bay Area. The following is a brief description of the initial criteria that laid the foundation for the Bay Area O&M HCP: Plan Area (geographic scope), covered species selection, covered activities, integration with other PG&E programs, and the requested duration of the permits.

1.5.1 Plan Area

The geographic scope of the Bay Area O&M HCP consists of Marin, Sonoma, Napa, Solano, Contra Costa, Alameda, Santa Clara, San Mateo, and San Francisco Counties (Figure 1-1); collectively this area is known as the study area. Within the greater study area, the Plan Area consists of PG&E gas and electric transmission and distribution facilities, ROWs, and a buffer area, the lands owned by PG&E and/or subject to PG&E easements to maintain these facilities, private access routes associated with PG&E's routine maintenance, and mitigation areas acquired to mitigate for impacts resulting from covered activities. The total Plan Area is approximately 402,440 acres; 128,735 acres (32%) are in natural land-cover types, 246,777 acres (61%) are in urban areas and 26,928 acres (7%) are in agricultural areas (Table 1-1). The Plan Area includes estimates, based on discussions with facility staff, of unmapped facilities (1% of electric and gas transmission, 3% of electric distribution, and 10% of gas distribution), projected minor new construction areas, and mitigation areas. The Plan Area is synonymous with the permit area.

Table 1-1. Plan Area

	Total HCP Plan Area (acres)	Urban Land-Cover Type (acres)	Agricultural Land-Cover Type (acres)	Natural Land-Cover Type (acres)
Electric transmission (160–400 feet)	61,637	16,829	5,013	39,795
Electric distribution (50 feet)	154,606	95,615	13,216	45,774
Gas transmission (300 feet)	49,186	25,032	5,174	18,980
Gas distribution (50 feet)	111,361	96,009	2,422	12,930
Minor new construction	3,768	377	377	3,014
Estimate for unmapped facilities	16,882	12,915	726	3,241
Mitigation areas	5,000			5,000
Total Plan Area	**402,440**	**246,777**	**26,928**	**128,735**

Sources: Land-cover type totals by facility type were derived by overlapping facility boundaries with mapped land-cover types. Land-cover types were derived from:

The USDA Forest Service 2000 and 2007 Classification and Assessment with Landsat of Visible Ecological Groupings (CALVEG) geodatabase (USDA Forest Service 2000 and 2007);

The California Department of Forestry and Fire Protection 2002 Multi-Source Land-Cover Data, (v02_2); and

The San Francisco Estuary Institute 1996 Modern Baylands EcoAtlas data.

Notes: Electric transmission buffer corridor varies depending on the facility size (500 kV—200 feet, 230 kV—120 feet, and 60/70/115 kV—80 feet).

Minor new construction is estimated at 1% of the total ROWs and assumed to occur within 80% natural vegetation, 10% urban areas, and 10% agricultural lands based on PG&E's assessment of the land-cover types likely to be affected by new construction.

Unmapped facilities are estimated at 1% of electric and gas transmission, 3% of electric distribution, and 10% of gas distribution based on discussions with facility staff; they are assumed to occur in proportion to the land-cover type for mapped facilities based on where PG&E facilities are located.

1.5.2 Covered Species

Covered species, as defined for the Bay Area O&M HCP, are federally-listed species that PG&E intends to conserve and protect through this plan in support of the federal incidental take permit. Tables 1-2 and 1-3, respectively address wildlife and plant species proposed for coverage in the Bay Area O&M HCP. The covered species would be protected through AMMs and vegetation management best management practices (BMPs); mitigation would compensate for impacts on these species resulting from PG&E's covered activities.

In determining which species to cover in the Bay Area O&M HCP, PG&E initially evaluated approximately 200 wildlife and 400 plant species (Appendix A). These lists were compiled using information from the following sources.

- California Natural Diversity Database (CNDDB) (California Department of Fish and Game 2011) for the nine counties of the Bay Area.
- California Native Plant Society's (CNPS's) (2012) Inventory of Rare and Endangered Vascular Plants of California.
- ICF research files and environmental reports.

- East Bay Municipal Utility District.
- Golden Gate National Resource Agency.
- East Bay Regional Parks District.
- Marin County Open Space District.
- Discussions with Dr. Booker Holton (Ph.D., Principal of TOVA with 20 years of experience in environmental and resource management) and Dr. Richard Arnold (Ph.D., President and Principal of Entomological Consulting and author of USFWS recovery plans for eight of the endangered or threatened California insects), independent biological consultants specializing in resource management and entomology, respectively.
- ICF and PG&E biological resource specialists.
- Discussions with USFWS and CDFW.

PG&E gathered information on the status, population trends, and distribution of each species with potential to occur in the Plan Area.

Because of the large number of rare endemic plants in the Bay Area, the Bay Area O&M HCP covers only those plants currently federally-listed as threatened or endangered. Therefore, the criteria for coverage of plants under the Bay Area O&M HCP were applied based on known presence in the Plan Area and current listing status under the ESA.

The following criteria were applied to each wildlife species to determine whether it would be covered in the Bay Area O&M HCP.

- **Range**: The species is known to occur or likely to occur within the Plan Area, based on credible evidence from the sources listed above.
- **Status**: The species is currently listed as threatened or endangered under the ESA or was judged to have a high probability of listing over the permit term by USFWS.
- **Impact**: The species may be adversely affected by PG&E's covered activities. This criterion assumed that AMMs would be implemented for activities that could affect listed species in the Plan Area, and that only those species for which impacts would not be avoided through use of the AMMs would be covered under the Bay Area O&M HCP.
- **Data**: Sufficient data exist on the species life history requirements, habitat requirements, and occurrence in the Plan Area to estimate impacts on the species and to develop conservation measures to compensate for these impacts and meet regulatory standards; or available data are limited, but important habitat for the species occurs in the Plan Area.

PG&E chose not to cover wildlife species if the criteria above were not met. Additionally, wildlife species that are only migratory, and which therefore spend limited time in the Plan Area and would not be affected by PG&E's covered activities, are not proposed for coverage.

Tables 1-2 and 1-3 list the wildlife and plant species, respectively, that were included for coverage in the Bay Area O&M HCP on the basis of the criteria described above. Appendix A, *Species Considered*, lists species potentially affected over the term of the permit and thus recommended for coverage under the Bay Area O&M HCP.

Table 1-2. Wildlife Species Proposed for Coverage

Species	Status[a] Federal	State	Notes
Invertebrates			
California freshwater shrimp *Syncaris pacifica*	E	E	Very specific distribution in Sonoma, Marin, and Napa Counties.
Conservancy fairy shrimp *Branchinecta conservatio*	E	–	Occurs only in northwestern Solano County.
Longhorn fairy shrimp *Branchinecta longiantenna*	E	–	Occurs only in specific, localized habitat type (sandstone or rocky vernal pools) in Alameda and Contra Costa Counties.
Vernal pool fairy shrimp *Branchinecta lynchi*	T	–	Occurs only in specific, localized habitat type (vernal pools) in Alameda, Contra Costa, Napa, and Solano Counties.
Vernal pool tadpole shrimp *Lepidurus packardi*	E	–	Occurs only in specific, localized habitat type (vernal pools) in Alameda, Contra Costa, and Solano Counties.
Delta green ground beetle *Elaphrus viridis*	T	–	Occurs in localized habitat type (vernal pool complexes) in the greater Jepson Prairie area in south-central Solano County.
Bay checkerspot butterfly *Euphydryas editha bayensis*	T	–	Extant only in Santa Clara and San Mateo Counties.
Callippe silverspot butterfly *Speyeria callippe callippe*	E	–	Occurs in limited areas of San Mateo, Solano, and San Francisco Counties.
Lange's metalmark butterfly *Apodemia mormo langei*	E	–	Very localized distribution; occurs in Contra Costa County near Antioch.
Mission blue butterfly *Plebejus icarioides missionensis*	E	–	Occurs in northern San Mateo, southern Marin, and San Francisco Counties.
San Bruno elfin butterfly *Incisalia mossii bayensis*	E	–	Very localized distribution; occurs in San Mateo County. Other populations reported though not confirmed through surveys.
Amphibians			
California tiger salamander *Ambystoma californiense* (Central CA DPS[b])	T	T	Occurs in Alameda, Contra Costa, Santa Clara, and Solano Counties.
California tiger salamander *Ambystoma californiense* (Sonoma County DPS[b])	E	T	Geographically separated population in Sonoma County.
California red-legged frog *Rana draytonii*	T	SSC	Occurs in all study area counties.
Reptiles			
Alameda whipsnake *Masticophis lateralis euryxanthus*	T	T	Occurs in Alameda, Contra Costa, and portions of Santa Clara Counties.
San Francisco garter snake *Thamnophis sirtalis tetrataenia*	E	E; FP	Occurs only in San Mateo County.

Table 1-2. Continued

Species	Status[a] Federal	State	Notes
Birds			
Ridgway's rail *Rallus obsoletus*	E	E; FP	Nesting occurs in all study area counties except San Francisco.
Mammals			
Salt marsh harvest mouse *Reithrodontomys raviventris*	E	E; FP	Occurs in all study area counties except San Francisco County.
San Joaquin kit fox *Vulpes macrotis mutica*	E	T	Occurs in Alameda, Contra Costa, and Santa Clara Counties.
Total: 18[c]			

Sources: California Department of Fish and Game 2011a, 2011b; U.S. Fish and Wildlife Service 2010.

[a] State-listing status included for informational purposes only. Status abbreviations:

Federal

E = listed as endangered under the Endangered Species Act.
T = listed as threatened under the Endangered Species Act.

State

E = listed as endangered under the California Endangered Species Act.
T = listed as threatened under the California Endangered Species Act.
FP = fully protected under the California Fish and Game Code.
SSC = species of special concern in California.
– = no listing.

[b] DPS – Distinct Population Segment

[c] Although it has two distinct population segments, California tiger salamander is one species.

Table 1-3. Plant Species Proposed for Coverage

Species	Status[a] Federal	State
Pallid manzanita *Arctostaphylos pallida*	T	E
Sonoma sunshine *Blennosperma bakeri*	E	E
Coyote ceanothus *Ceanothus ferrisae*	E	–
Fountain thistle *Cirsium fontinale* var. *fontinale*	E	E
Santa Clara Valley dudleya *Dudleya abramsii* subsp. *setchellii*	E	–
Contra Costa wallflower *Erysimum capitatum* var. *angustatum*	E	E
Marin dwarf-flax *Hesperolinon congestum*	T	T
Burke's goldfields *Lasthenia burkei*	E	E
Contra Costa goldfields *Lasthenia conjugens*	E	–
Sebastopol meadowfoam *Limnanthes vinculans*	E	E
Antioch Dunes evening primrose *Oenothera deltoides* ssp. *howellii*	E	E
White-rayed pentachaeta *Pentachaeta bellidiflora*	E	E
Metcalf Canyon jewelflower *Streptanthus glandulosus* subsp. *albidus*	E	–
Total: 13		

Sources: California Department of Fish and Game 2010b; U.S. Fish and Wildlife Service 2010.

Other Sources Consulted:

EBMUD = East Bay Municipal Utility District. Owns and maintains lands in East Bay and Central Valley. Maintains list of plants of concern, shares lists with other databases such as CNPS and CNDDB. Maintains locational information.

GGNRA = Golden Gate National Recreation Area. National Park Service lands in Marin County and San Francisco County. GGNRA internally tracks several species that are not tracked by other organizations. Maintains a separate database.

EBRPD = East Bay Regional Park District. Maintains regional parks throughout the East Bay Area. Internally tracks rare plants and maintains online rare plant lists for each regional park. Shares data with other databases (CNPS, CNDDB).

MCOS = Marin County Open Space District. Maintains open space lands in Marin County. Tracks rare plants internally, but shares data with CNDDB and CNPS.

[a] State listing status is for informational purposes only. Status abbreviations:

Federal

E = listed as endangered under the federal Endangered Species Act.

T = listed as threatened under the federal Endangered Species Act.

State

E = listed as endangered under the California Endangered Species Act.

T = listed as threatened under the California Endangered Species Act.

– = no listing.

Species accounts for wildlife and plant species appear in Appendix B.

The Bay Area O&M HCP does not include listed fish species because no USFWS freshwater fish are expected to be affected and because NMFS indicated that it cannot commit to authorizing take of listed fish species either in the context of a programmatic permit or for a 30- to 50-year permit term. PG&E will continue to request project-level permits for activities that may result in impacts on listed fish species from USFWS for freshwater fish and from NMFS for anadromous fish. PG&E relies on the Section 404 CWA permitting process when sensitive fish are identified within an activity boundary, and streambed alteration agreements with CDFW are sought as necessary.

1.5.3 Covered Activities

The Bay Area O&M HCP covers all PG&E O&M, minor new construction, and PSEP activities that are related to PG&E's natural gas and electric transmission and distribution systems that may result in take of covered species and that are located in the Plan Area.

O&M activities occur throughout the existing network of facilities, and their potential impacts are described in detail in Chapter 3, *Covered Activities*, and Chapter 4, *Covered Species Impact Analysis*. PG&E commits to the mitigation approach that is outlined in the Bay Area O&M HCP, which is based on estimates of future impacts. *The intent of the conservation strategy is to provide mitigation prior to impacts occurring.*

Covered activities would occur at or near the existing facilities. Minor new construction activities include installing new or replacement structures to upgrade facilities or to extend service to new customers. Minor new construction, when in natural vegetation or agricultural lands that contain suitable habitat for covered species, is limited to 2 miles or fewer of new electric or gas line extensions from an existing line, a total of 1.0 acre or less of new gas pressure limiting stations (PLSs) within the HCP study area, and 0.5 acre or less per electric substation expansion. End-to-end extensions exceeding 2 miles would not be covered under the Bay Area O&M HCP. Multiple 2-mile extensions in different geographic areas would be covered, but each would be treated as a separate activity. The size of a minor new construction project would be estimated as the total footprint, expressed in acres. Consistent with the requirements of NEPA and CEQA, the Bay Area O&M HCP would not allow segmentation of proposed construction to obtain coverage under the Bay Area O&M HCP.

PG&E's CPSI program involves upgrading key existing gas transmission pipelines located in heavily populated and other critical areas. Covered activities include inspection, field testing, and potentially replacing many pipeline segments to ensure reliable and safe delivery of gas to customers. Pipeline replacements are estimated to average between 4 miles and 8 miles and are primarily in urban areas. However, there would also be replacement of natural vegetation.

The Bay Area O&M HCP does not cover the following activities.

- Activities outside the Plan Area.
- Activities undertaken by entities other than PG&E, or those companies or individuals performing work that is not on PG&E's behalf.
- Application of herbicides, rodenticides, or fungicides because of their uncertain impacts on covered species.

1.5.4 Other Complementary PG&E Programs

Several of PG&E's environmental programs that complement the Bay Area O&M HCP are described below.

1.5.4.1 Valley Elderberry Longhorn Beetle Conservation Program

In June 2003, USFWS completed the 30-year term BO (USFWS file no. 1-1-01-F-0114) for PG&E's impacts on valley elderberry longhorn beetle, a species federally listed as threatened, on lands administered by the U.S. Department of Agriculture Forest Service (USFS) or the Bureau of Land Management (BLM), and other lands containing gas, electric, and/or related facilities within the range of the species. The BO and PG&E's *Valley Elderberry Longhorn Beetle Conservation Program* present information on the potential impacts of ongoing, routine O&M of PG&E facilities (including facility access roads) on valley elderberry longhorn beetle. USFS and BLM amended the BO on June 11, 2014 to include new information on valley elderberry longhorn beetle, including habitat and impacts, and PG&E's need for increased shrub pruning and removals.

1.5.4.2 Safe Harbor Agreements

Safe Harbor Agreements are "enhancement of survival" permits under Section 10(a)(1)(A) of the ESA. USFWS issues these permits to landowners who wish to manage their land for the benefit of listed species. The permits have a limited duration. During the permit term, the landowner agrees to maintain the land in a manner that results in improvements above what was defined as the baseline for the listed species at the time of permit issuance, thus providing a net benefit to the listed species. At the end of the permit term, the landowner has the ability to alter or stop land management so long as conditions do not drop below the baseline.

PG&E has developed two Safe Harbor Agreements with USFWS on land that it owns or for which it holds the title in fee. The Safe Harbor Agreement on Tulare Hill in Santa Clara County was completed in April 2008. A similar agreement for two PG&E parcels adjacent to Antioch Dunes National Wildlife Refuge (NWR) in Contra Costa County was finalized in March 2010. Both agreements are described below.

Both agreements cover species that also are covered by the Bay Area O&M HCP. At the end of the permit term for the Safe Harbor Agreements, PG&E will either extend the permit term of the agreements or let the agreements expire and continue with the conservation actions identified in the Bay Area O&M HCP.

Tulare Hill Safe Harbor Agreement

PG&E owns approximately 45 acres containing serpentine grassland habitat on Tulare Hill in central Santa Clara County. On April 10, 2008, PG&E and USFWS entered into the Safe Harbor Agreement, which covers the bay checkerspot butterfly, which is federally endangered, the Metcalf Canyon jewelflower, which is federally endangered, and the Santa Clara Valley dudleya, which is federally threatened. The purpose of the Safe Harbor Agreement is for PG&E and USFWS to collaborate on and implement conservation measures that are reasonably expected to provide a net conservation benefit for the covered species. This benefit would be accomplished by restoring and maintaining suitable serpentine habitat on Tulare Hill, primarily by controlling growth of nonnative grasses through livestock grazing to enable the continued growth of dwarf plantain (*Plantago erecta*), the bay checkerspot butterfly's primary host plant. In addition, the Safe Harbor Agreement provides

PG&E with certain regulatory assurances that USFWS would not impose future restrictions on the property as a result of PG&E's conservation actions. The Safe Harbor Agreement is intended to remain in effect through 2038 unless extended or PG&E implements the conservation actions in the Bay Area O&M HCP in lieu of the Safe Harbor Agreement.

Antioch Dunes Safe Harbor Agreement

PG&E owns two 6-acre parcels along the south shore of the San Joaquin River and adjacent to the Sardis Unit of the Antioch Dunes NWR in Contra Costa County. On March 3, 2010, PG&E and USFWS entered into a Safe Harbor Agreement, which covers the Lange's metalmark butterfly, which is federally threatened, and the Antioch Dunes evening primrose and Contra Costa wallflower, both of which are federally and state-listed as endangered. The purpose of the Safe Harbor Agreement is to benefit these species by restoring the available habitat on PG&E's parcels, creating opportunities for population recolonization and expansion, maintaining suitable habitat over the long term, and providing niches for several rare populations of species that are endemic to the Bay Area. Restoration actions would involve primarily controlling invasive nonnative weeds that pervade the refuge and the surrounding area. In addition, the Safe Harbor Agreement provides PG&E with certain regulatory assurances that USFWS would not impose future restrictions on the property as a result of PG&E's conservation actions. The Safe Harbor Agreement is intended to remain in effect until 2020 unless extended or PG&E implements the conservation actions in the Bay Area O&M HCP in lieu of the Safe Harbor Agreement.

1.5.4.3 PG&E's Avian Protection Plan

The PG&E's Avian Protection Plan ensures that ongoing operation of PG&E's facilities in California is in compliance with the MBTA, ESA, and CESA. This plan has been fully operational since 2003.

The systemwide plan has the following goals.

- Comply with state and federal bird and nest protection laws.
- Decrease the risk of electrocution of raptors and other birds through corrective and preventive actions, while increasing system reliability.
- Collect and maintain data associated with bird electrocution incidents for the purposes of identifying high-risk poles and equipment and their geographic distribution.
- Provide information and guidance on bird-related issues throughout PG&E (e.g., facility-nest issues).

The plan has resulted in safety improvement of many poles and in more effective tracking of bird electrocutions.

1.5.5 Requested Duration of the Permits

The *permit term* is the time period during which all covered activities receive take authorization under a habitat conservation plan, consistent with the requirements of the habitat conservation plan. The permit term is also the time during which all conservation actions must be successfully completed to offset covered activity impacts. Prior to permit expiration, PG&E may apply to renew or amend the Bay Area O&M HCP and its associated permit to extend the permit term. PG&E is requesting a 30-year permit for the Bay Area O&M HCP for the reasons discussed below.

PG&E has generated and delivered energy for more than 100 years, and PG&E does not expect a major technology change in the delivery of electricity and natural gas to its customers within the next 50 years or more. Electric and gas infrastructure typically has a 50- to 75-year life span. The existing electric and natural gas facilities will need to remain operable and be periodically maintained, upgraded, and/or refurbished to ensure safe and efficient operation. PG&E must maintain these facilities at consistent intervals and incidental take authorization is necessary to conduct such activities over the life of these facilities. Ongoing O&M activities are expected to continue in perpetuity; consequently, incidental take authorization for these activities is needed for as long a period as feasible.

As described in Chapter 3, *Covered Activities*, PG&E's activities primarily involve day-to-day O&M of existing facilities as well as large maintenance projects. These O&M activities typically result in localized, small impacts on habitat over a large geographic area. Electric transmission and distribution lines are located above ground and are subject to equipment failure due to emergencies, storms, and outages; accordingly, compared with underground facilities, these lines require more frequent repairs and updates to keep them functioning efficiently. In most cases, electric transmission infrastructure is anticipated to remain above ground, and no major changes are anticipated for either the construction or installation methodology. By contrast, gas transmission and distribution lines are primarily underground, and repairs are not anticipated to be as frequent. Nonetheless, as the infrastructure ages and because of new federal regulations (i.e., Pipeline Safety Act), the gas lines are inspected regularly and repairs are made as necessary. Accordingly, for both gas and electric transmission lines, many decades of continued maintenance work is expected, and the associated habitat and species impacts can be estimated for the duration of the permit period.

PG&E will need to continue to maintain its facilities over the next 100 years, and its ROWs will continue to support habitat for endangered species. Because the facilities and infrastructures have stayed the same, PG&E's maintenance practices have not changed substantially and are not likely to change substantially over the next 30 years. PG&E conducted the impact analysis for a 50-year period and assumed the worst-case scenario of all impacts occurring over a 30-year period. Therefore, at the end of a 30-year permit, PG&E and USFWS expect that there will be some take authorization remaining, which will help facilitate permit renewal.

PG&E will assure funding for the mitigation needed to compensate for project effects. The administrators of the plan will forecast anticipated program needs and budget accordingly; as the HCP is rate based, the funding will be assured to keep pace with program expenditures. Based on the implementation horizon for covered activities, the ongoing regulatory requirement of O&M activities, and the need to provide mitigation, PG&E has determined that a 30-year permit term provides the most regulatory certainty while also addressing the biological considerations of the covered species. Furthermore, a 30-year permit term affords efficiencies in operations, conservation implementation, and program administration that are unavailable with a shorter permit.

Incidental take authorization for covered activities would expire at the end of the permit term, unless the permit is renewed or replaced. Near the end of the permit term, PG&E would determine whether to request an extension of the permit through the process described in Chapter 6, *Plan Implementation and Funding*.

1.6 Environmental Screening Processes

PG&E implements a variety of environmental screening processes based on the size of the work, type of facility, and urgency of the activity. In general, the CPUC requires that PG&E provide reliable energy to the public in a way that avoids or substantially lessens the related environmental impacts. To achieve this, PG&E's overall environmental screening processes can be categorized into four phases: project assessment, environmental screening and review, project refinement, and release to construction (Figure 1-2).

1.6.1 Phase 1 – Project Assessment

During the first phase, PG&E staff (land planners and engineers) evaluate a given project and begin developing the project scope and description. The level of detail in the project description varies based on the activity size (e.g., less detailed for small projects and more detailed for large projects) and an initial assessment of the site conditions and constraints. Typically, a project description for a large maintenance project, such as electric reconductoring or gas pipeline replacement project includes an evaluation of site access, temporary construction areas, construction footprint, construction schedule, and outage schedule, with the ultimate goal of assessing the environmental impacts and potential discretionary permits and environmental review requirements. The time required to develop the project scope and description varies from 1 day to greater than 1 year, with some projects taking 2 years or more for assessment and design because of required field surveys.

1.6.2 Phase 2 – Environmental Screening and Review

During the second phase, PG&E's staff of land planners, biologists, cultural resource specialists, vegetation management staff, and environmental field specialists conducts initial environmental screening and review of the proposed project and associated work activities. Multiple environmental screening processes are used by the various staff supporting the project depending on the line of business and type of work. Land planners review ministerial and discretionary permits as well as land rights. The HCP team provides HCP compliance screening. Analysts and planners for distribution projects conduct automated environmental assessment (AEA) (e.g., environmental screening). Land planners, vegetation management inspectors, and biologists conduct riparian screening for vegetation management activities. During the screening process, projects and activities are evaluated for potential impacts on wetlands, state and federal waters, and listed or special-status species and their respective habitats. PG&E staff verifies that the necessary land rights are obtained for both temporary and permanent easements and ensures that all projects are in compliance with the CPUC's environmental review requirements. PG&E maintains a comprehensive geographic information system to evaluate projects, and routinely uses this system to evaluate all aspects of a project's scope or description.

PG&E's Environmental Team routinely evaluates the impacts of proposed projects and recommends the appropriate avoidance, minimization, or mitigation measures, based on best practices and permit requirements, for the following resource areas.

- Land use and planning practices to minimize impacts for siting new distribution and transmission lines.
- Visual resource practices to lessen the visual impacts on a sensitive receptor.
- Biological resources evaluation and screening to minimize environmental impacts.

- Geology and soils practices to engineer facilities correctly and minimize erosion.
- Water quality practices to protect water quality.
- Cultural resources practices to protect cultural resources.
- Transportation and circulation practices to minimize traffic impacts.
- Noise and vibration practices to minimize noise and vibration impacts on sensitive receptors.
- Air quality practices to minimize air quality impacts and vehicle emissions.
- Hazardous materials practices to ensure the proper management, use, disposal, and storage of hazardous materials.
- Environmental justice practices to ensure minority communities are not adversely affected.
- Cleanup and restoration practices to ensure work areas are restored.

1.6.3 Phase 3 – Project Refinement

During the third phase, based on the results of the environmental screening and review, PG&E staff (land planners, biologists, field crews, and other specialists) identifies regulatory requirements and other appropriate avoidance and minimization measures and BMPs to avoid and minimize impacts from construction. These measures are added to the project work orders as required conditions. These measures include voluntary measures, such as Environmental Protection Measures, Applicant Proposed Measures, BMPs, and Field Protocols, and required compliance measures, such as permit conditions and mitigation measures. Based on this information and information from the second phase, the project may be refined or modified to minimize its impacts.

1.6.4 Phase 4 – Release to Construction

The fourth phase is a release to construction review. PG&E staff implements an Environmental Release to Construction (RTC) process, or an equivalent procedure, to ensure projects and activities are not released for construction to begin without being reviewed for environmental constraints or restrictions. The RTC process is primarily for large activities, though small activities are constrained by AEA, the HCP Portal, or other line of business procedures.

This screening process, in conjunction with PG&E's annual environmental awareness training and project-specific tailboard trainings, helps ensure that PG&E avoids and minimizes its impacts and complies with applicable environmental laws and regulations.

1.7 Document Organization

This document is organized into the following chapters and appendices.

- Chapter 1, *Introduction*
- Chapter 2, *Environmental Setting*
- Chapter 3, *Covered Activities*
- Chapter 4, *Covered Species Impact Analysis*

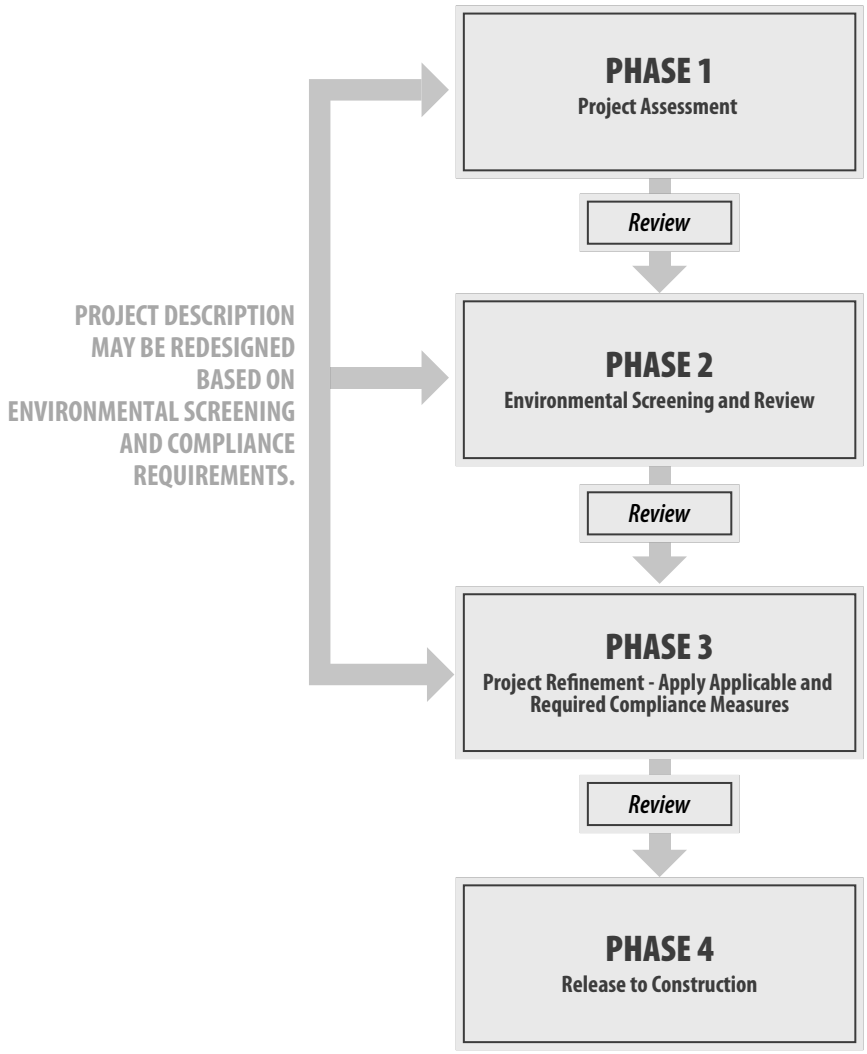

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Figure 1-2
PG&E's Generalized Environmental Screening Process

- Chapter 5, *Conservation Strategy*
- Chapter 6, *Plan Implementation and Funding*
- Chapter 7, *Alternatives Analysis*
- Chapter 8, *References Cited*
- Chapter 9, *Preparers*
- Chapter 10. *Glossary*
- Appendix A, *Species Considered*
- Appendix B, *Species Accounts*
- Appendix C, *Implementation Tools*

Chapter 2
Environmental Setting

*[**Summary**: This chapter presents the physical and biological setting of the Plan Area considered within the study area comprising the nine Bay Area counties. PG&E determined the extent and amount of ROW acreage located within the study area by measuring mapped facilities and buffer areas and by estimating unmapped facilities, new facilities, and mitigation lands to develop the Plan Area. This method allowed for a calculation of the total area of land-cover types that are adjacent to facilities that could be affected either directly or indirectly by covered activities. PG&E facilities in the Bay Area are located in urban (62%), natural (31.1%) and agricultural land-cover types (6.9%). Tables 2-3, 2-4, and 2-5 display the extent of modeled habitat for covered wildlife species within the study area and Plan Area, and Table 2-6 displays the extent of occupied plant habitat in the Plan Area. Twelve covered species have designated critical habitat within the Plan Area.]*

2.1 Introduction

This chapter presents the physical and biological setting of the study area and is based on publicly available data. It describes the baseline conditions upon which Chapter 4, *Covered Species Impact Analysis*, and Chapter 5, *Conservation Strategy*, are based.

2.2 Physical Environment

This section describes the physical setting of the study area and includes general discussions of climate, topography, soils, hydrology, and floodplains.

2.2.1 Climate

The study area has a Mediterranean climate characterized by summer fog along the coast and East Bay, cool summers between coastal areas and Coast Ranges, and hot summers east of the Coast Ranges (California Department of Fish and Game 2003). Precipitation in the study area falls mostly as rain during the late fall, winter, and early spring months, although the higher elevations can receive infrequent snowfalls during the winter months, with snow sometimes lasting for 2 to 3 days on Mount Diablo.

The climate in the study area is influenced strongly by its location and topography. In the summer, a steady marine wind blows through the Golden Gate and up the Carquinez Strait. The eastern part of the study area is not influenced by this marine air to the same extent as the western part. Consequently, temperatures in the eastern part of the study area are generally warmer than those in the western part during the summer. During the winter, temperatures in the western part of the study area are generally warmer than those in the eastern part of the study area, owing to the tempering influence of the ocean and bay in the west.

2.2.2 Topography

The study area is composed of four general physiographic regions: coastal areas, highlands of the Coast Ranges, intermountain valleys, and the Sacramento–San Joaquin River Delta (Delta). These regions have been shaped by a complex geologic history. Because of this complexity, elevations in the study area range from Delta islands that are at or below sea level near Brentwood and Oakley to the 4,216-foot peak of Mount Hamilton, the highest point in the study area. Most of the mountain valleys are geologically young. The foothills have gently to steeply sloping topography.

Geologic features in the study area include a portion of the Coast Ranges, which trend northwest–southeast. These ranges formed over millions of years as a result of uplift along the San Andreas fault and several of its subsidiary faults, including the San Pablo and Hayward faults (Alt and Hyndman 2000). Movement along the faults continues today, subjecting the area to moderate to large earthquakes.

The dominant geologic features in the study area are the Franciscan Complex and the Great Valley Sequence. The Franciscan Complex is a poorly understood assortment of sedimentary and other rocks that were deposited along with basalt flows on the ocean floor. The Great Valley Sequence, which is better understood, is characterized by oceanic sediments of the same age as the rocks of the Franciscan Complex. Both features are characterized by tilting and uplifting, but the Franciscan Complex has been deformed under pressure from faulting. This complex geologic history has resulted in extremely diverse soils, hydrology, and topography.

2.2.3 Soils

Soils in the study area are highly variable because of the complex geology, topography, and hydrology of the area. Most of the soils in the study area were formed from alluvial, sedimentary, and meta-sedimentary sources and have been formed in concert with the complex geologic history of the area. Serpentine soils, which contain relatively high levels of asbestos and certain metals, although generally rare, are found in many locations in the study area. Most plant species do not survive in serpentine soils. Those species that can survive often have evolved specifically for serpentine soil conditions to the point that they may not be found elsewhere (California Department of Fish and Game 2003; U.S. Fish and Wildlife Service 1998a). Many areas on the lower terraces have been urbanized or converted to agricultural use. For example, most of the low-lying lands in the western Delta have been reclaimed by protective dikes and converted to agricultural uses. As a result, the eastern portions of Solano and Contra Costa Counties have subsided substantially and are currently at or below sea level.

2.2.4 Hydrology

The State Water Board has developed a geographic information system (GIS) database that delineates watersheds in the state. Although much of the study area lies within the San Francisco Bay Hydrologic Region, the study area extends into portions of four adjacent hydrologic regions, as well: the North Coast Hydrologic Region, the Sacramento River Hydrologic Region, the San Joaquin Hydrologic Region, and the Central Coast Hydrologic Region.

Ephemeral and intermittent streams are the dominant hydrologic features in the study area due to the Mediterranean climate's characteristic lack of rainfall during the summer months. Total precipitation falls mostly as winter rain and varies from an average of 12 inches per year in the San

Joaquin Delta watershed to almost 60 inches in the Gualala-Salmon watershed in coastal Sonoma County.

Generally, surface flow in ephemeral streams is supplied by rainfall. These streams flow only during and immediately following rain events. Surface flow in intermittent or seasonal streams is supplied by a combination of rainfall runoff and groundwater. Accordingly, these streams generally flow throughout the rainy season and into the late spring or early summer. Perennial streams in the study area also are supported by rainfall runoff and groundwater, but, unlike seasonal streams, they run year-round with major dry-season inputs from both natural and artificial sources (e.g., upwelling springs and surface and subsurface flows from local irrigation, respectively).

The natural hydrology of many of the major streams in the urban areas has been altered for flood control or to convey irrigation water. Many streams have been disconnected from their historical floodplains by levees and channelization, and some of these streams are maintained as flood control channels that support little or no riparian vegetation. Outside the urbanized areas, most drainages remain relatively natural and occupy at least a portion of their historical floodplains. Most of these features are ephemeral or intermittent, however, and generally support narrow floodplains with limited riparian habitat.

2.2.5 Land-Cover Mapping

This section describes the sources of data and the processes used to map land-cover types. The sources provided regional-level data for assessment of the impacts of covered activities on covered species within the Plan Area.

2.2.5.1 Data Sources

A land-cover map was used to present the best available data appropriate for a regional assessment of the Bay Area. The data used to generate the land-cover map came from three sources.

- The USDA Forest Service 2000 and 2007 Classification and Assessment with Landsat of Visible Ecological Groupings (CALVEG) geodatabase (USDA Forest Service 2000 and 2007).
- The California Department of Forestry and Fire Protection 2002 Multi-Source Land-Cover Data, (v02_2).
- The San Francisco Estuary Institute 1996 Modern Baylands EcoAtlas data.

Descriptions of these data sources are provided below, and links to the online metadata for each source are provided in Chapter 9, *References Cited*.

Classification and Assessment with Landsat of Visible Ecological Groupings

CALVEG is a USDA Forest Service product that serves as an assessment for vegetation-related resources throughout much of California. CALVEG is derived from classified Landsat Thematic Mapper datasets and spatial modeling. Cover types are derived from imagery classification and manual digitization. Ecological regions are modeled differently, based primarily on slope, aspect and, occasionally, soil. The CALVEG effort began in 1978 with ecological zones receiving updates as recently as 2008. Data from 2000 and 2007 was used in this analysis. CALVEG offers a custom classification system but also offers California Wildlife Habitat Relationships System classifications

that were created through metadata crosswalk. CALVEG was compiled using a minimum mapping unit of 2.5 acres.

California Department of Forestry and Fire Protection Multi-Source Land-Cover Data

The California Department of Forestry and Fire Protection is mandated to assess the amount, extent, and condition of California's forests and rangelands and identify alternative management and policy guidelines. To fulfill this mandate, the Fire and Resource Assessment Program (FRAP) has combined habitat distribution data from numerous sources collected at various times throughout the year into a format compatible for use within GIS. The goal is to create an accurate depiction of the habitat types across California. The minimum mapping unit is 2.47 acres (1 hectare). Several land-cover types, including wetland and riparian areas, were delineated at this resolution. The various datasets were standardized in the California Wildlife Habitat Relationships System classifications through metadata crosswalk. Seventeen different data sources were used. The minimum mapping units had a range between 0.15 acre and 100 acres. The data were later resampled (standardized) to 2.47 acres. The California Department of Forestry and Fire Protection provides a full description of the data and the methods used to develop them (California Department of Forestry and Fire Protection 2002).

San Francisco Estuary Institute Modern Baylands

The San Francisco Estuary Institute (SFEI) published the Modern Baylands data in 1996 as part of EcoAtlas, a digital product that provides both historical and current data about the natural resources around the Bay Area—primarily wetland locations that surround the entire San Francisco Bay and Suisun Marsh. These data support a long-term monitoring effort of baylands and associated habitats. SFEI used a number of sources to produce the Modern Baylands data, including high-resolution color infrared photos (San Francisco Estuary Institute 1996). Major wetlands were mapped with an approximately 100 acre- (40 hectare-) minimum mapping unit, and smaller wetlands were encoded as attributes of upland polygons.

2.2.5.2 Mapping Procedures

Approximately 90% of the study area is represented by CALVEG. The first phase of land-cover data compilation simply identified areas within the study area where CALVEG data existed and did not exist. CALVEG data was available throughout the study area, with the exception of southern Santa Clara County.

The second phase of data compilation addressed the deficiency in CALVEG by using FRAP's Multi-Source Land-Cover Data to represent the area not addressed by CALVEG data. Both CALVEG and FRAP Multi-Source data contained classifications using the California Wildlife Habitat Relationships System, which allowed for the maintenance of a standard classification system for much of the Plan Area.

The final phase of data compilation involved incorporating the SFEI Modern Baylands data by replacing areas where CALVEG overlapped with SFEI Modern Baylands data.

The data sources used to map the land-cover types are presented graphically in Figure 2-1.

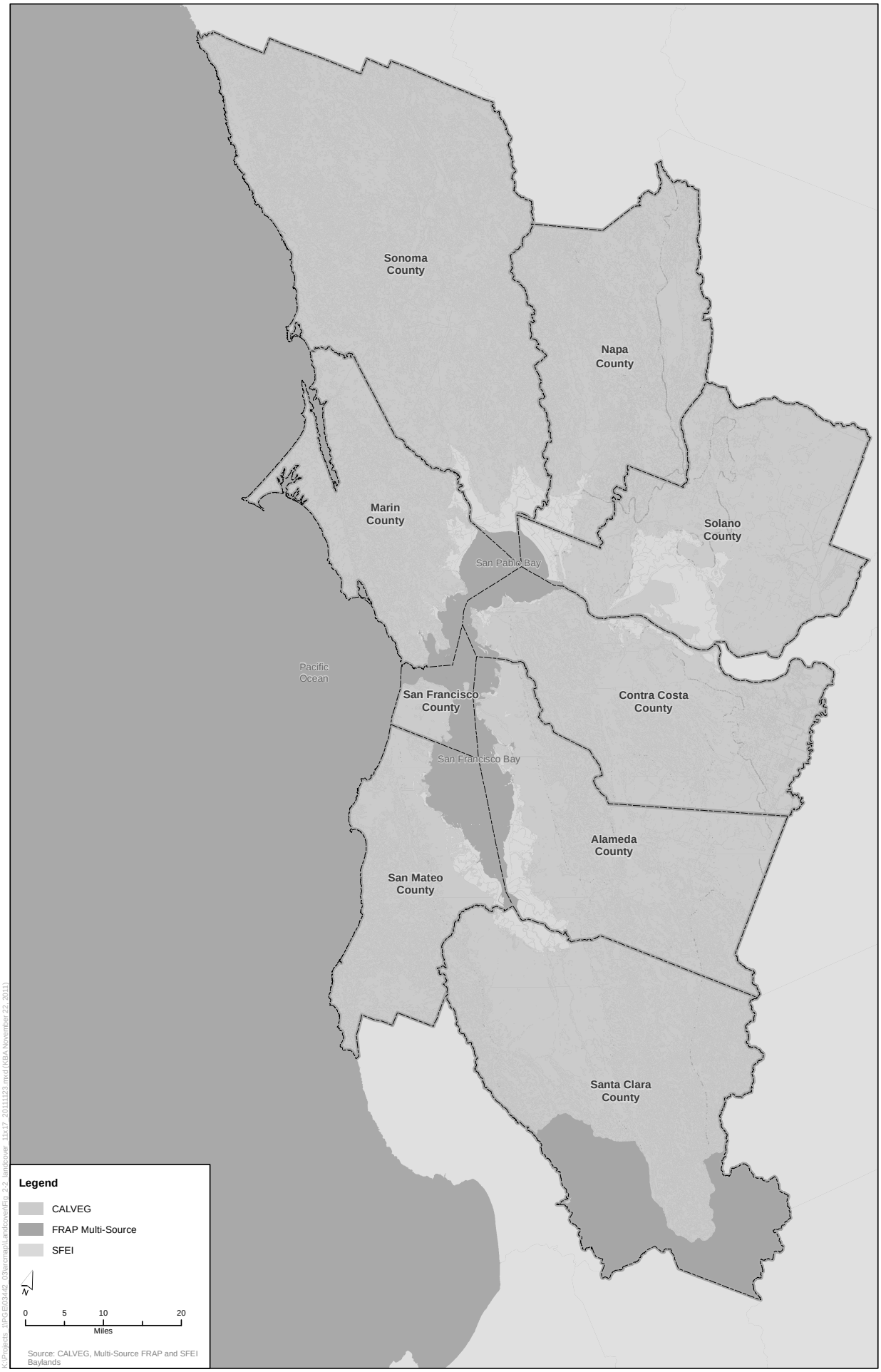

Figure 2-1
Plan Area and Data Sources for Land-Cover Types

2.2.5.3 Land-Cover Type Classification

The classification system used is a combination of the California Wildlife Habitat Relationships System, derived from CALVEG, FRAP Multi-Source, and SFEI's Modern Baylands classification system. Plant species nomenclature follows *The Jepson Manual* (Baldwin et al. 2012). Land-cover type mapping results are presented in Figure 2-2a and shown in more detail in the land-cover type figures developed for each county in the study area (Figures 2-2a through 2-2j).

Land-cover types fall into three major categories: natural, agricultural, and urban. These categories are shown in Figures 2-2a through 2-2j. Natural land-cover types consist of all types that are not agricultural or urban types, including forest, grassland, riparian, shrubland, wetland, dune, and barren/ruderal.

2.2.6 Facilities by Land-Cover Type in the Plan Area

The Bay Area O&M HCP GIS database consists of three primary data layers: the Plan Area boundary, PG&E gas and electric transmission and distribution facilities,[1] and land-cover types. PG&E determined ROWs by determining a maximum corridor width of mapped facilities that varied depending on the size of the facility and doubled the width to provide a buffer area outside of the ROW. This allowed for a calculation of the total area adjacent to facilities that could be affected by covered activities (Plan Area). These estimates were based on the facility size (Table 2-1).

Table 2-1. Type and Size of Facilities and Associated Maximum Width of Buffered ROWs

Type of Facility	Size of Facility	Maximum Facility Corridor Width (feet)	Buffer Area (feet)	Total Area (feet)
Electric transmission	500 kV	200	200	400
Electric transmission	230 kV	120	120	240
Electric transmission	60/70/115 kV	80	80	160
Gas transmission	All	150	150	300
All distribution facilities	All	25	25	50

ROW widths are conservative in that they represent the maximum area in which covered activities would occur. The PG&E ROWs and land-cover type data were intersected and the GIS database queried to determine the extent of each land-cover type within the ROWs.

Table 2-2 presents the extent of each land-cover type within gas transmission, gas distribution, electric transmission, and electric distribution. As indicated in this table, many PG&E facilities are in urban, grassland, and agricultural land-cover types. The sizes of areas where gas and electric facilities appear to be in natural land-cover types (e.g., grassland and tree- and shrub-dominated lands) are likely overstated because gas and electric facilities are most often located in roadside or other barren or ruderal areas that may be near these land-cover types but are unlikely to actually fall within these classification types. Thus, disturbances to these natural land-cover types are likely

[1] Not all of PG&E's facilities are available as a GIS data layer. Unmapped facilities are estimated at 1% of electric and gas transmission, 3% of electric distribution, and 10% of gas distribution, based on discussions with facility staff. Additionally, PG&E policy prevents maps of existing facilities to be made public, so facility locations are not shown in the Bay Area O&M HCP figures.

to be smaller than the mapped facility would indicate. Similarly, unmapped facilities are likely to be in urban areas or other ruderal areas.

Table 2-2. Mapped Extent of Land-Cover [a] Types Present

	Electricity Distribution (acres)	Electricity Transmission (acres)	Gas Distribution (acres)	Gas Transmission (acres)	Total (acres)	Percent of Total
Natural Lands[a]						
Forest						
Blue Oak Woodland	1,150	1,253	230	104	2,737	0.73%
Blue Oak-Foothill Pine	179	97	2	7	286	0.08%
Closed-Cone Pine-Cypress	269	217	1		487	0.13%
Coastal Oak Woodland	4,580	4,213	2,413	782	11,988	3.18%
Douglas Fir	779	336	85	42	1,242	0.33%
Eucalyptus	453	148	286	92	979	0.26%
Montane Hardwood	5,192	2,559	1,094	408	9,253	2.46%
Montane Hardwood-Conifer	1,690	681	285	60	2,716	0.72%
Ponderosa Pine	27	1	13		41	0.01%
Redwood	1,796	501	93	28	2,417	0.64%
Sierran Mixed Conifer	66	33	6		105	0.03%
Unknown Conifer Type	22	67	0		89	0.02%
Valley Oak Woodland	452	170	213	155	991	0.26%
Grassland						
Annual Grassland	18,798	19,026	5,936	11,154	54,915	14.57%
Pasture	3,824	3,182	444	3,148	10,598	2.81%
Perennial Grassland	26	12	0	8	46	0.01%
Riparian						
Montane Riparian	594	85	352	100	1,131	0.30%
Valley Foothill Riparian	421	176	193	128	918	0.24%
Willow Grove (Sausal)	1	0	0		1	0.00%
Shrubland						
Alkali Desert Scrub	3	29	0	18	50	0.01%
Chamise-Redshank Chaparral	420	697	77	106	1,299	0.34%
Coastal Scrub	702	615	94	244	1,656	0.44%
Mixed Chaparral	813	760	53	1	1,627	0.43%
Montane Chaparral		0			0	0.00%
Unknown Shrub Type	93	55	16	36	200	0.05%
Wetland						
Active Salt Pond	69	558		0	627	0.17%
Crystallizer	15	7	1		23	0.01%
Diked Marsh	127	470	26	168	791	0.21%
Estuarine	5	1			7	0.00%
Farmed Bayland	270	473	47	92	882	0.23%
Freshwater Emergent Wetland	64	107	8	86	265	0.07%
Grazed Bayland	57	98	3	119	278	0.07%
High Elevation Tidal Marsh	122	560	15	45	743	0.20%
Inactive Salt Pond	22	134	0		156	0.04%

Table 2-2. Continued

	Electricity Distribution (acres)	Electricity Transmission (acres)	Gas Distribution (acres)	Gas Transmission (acres)	Total (acres)	Percent of Total
Natural Lands[a] (continued)						
Wetland (continued)						
Lacustrine	296	285	66	110	758	0.20%
Lagoon	56	42	13	7	117	0.03%
Low/Mid Elevation Tidal Marsh	14	210	0	2	227	0.06%
Major Channel	39	100	2	26	168	0.04%
Managed Marsh	365	205	10	331	911	0.24%
Marine	6		0		6	0.00%
Muted Tidal Marsh	23	97	3	9	132	0.03%
Perennial Lake or Pond	1		0		2	0.00%
Riverine	100	131	11	120	362	0.10%
Saline Emergent Wetland	89	101	26	45	262	0.07%
Tidal Flat	55	243	10	4	312	0.08%
Water	8	6	0	0	15	0.00%
Wet Meadow	2		0	2	4	0.00%
Dune						
Dune			16		16	0.00%
Barren/Ruderal						
Barren	1,569	983	767	1,163	4,482	1.19%
Ruderal	45	67	21	31	164	0.04%
Subtotal	45,774	39,795	12,930	18,980	117,480	31.18%
Agriculture						
Agriculture	1,667	332	702	499	3,201	0.85%
Cropland	7,281	2,255	1,338	2,500	13,374	3.55%
Deciduous Orchard	591	286	75	171	1,123	0.30%
Evergreen Orchard	5	3	1	2	11	0.00%
Irrigated Grain Crops	2	4		8	13	0.00%
Irrigated Row and Field Crops	2,182	1,549	167	1,599	5,497	1.46%
Rice	14	1			14	0.00%
Vineyard	1,474	583	138	396	2,592	0.69%
Subtotal	13,216	5,013	2,422	5,174	25,825	6.85%
Urban						
Storage or treatment basin	31	86	1	38	156	0.04%
Urban	95,584	16,743	96,008	24,994	233,329	61.93%
Subtotal	95,615	16,829	96,009	25,032	233,485	61.97%
Total[b]	**154,606**	**61,637**	**111,361**	**49,186**	**376,789**	100.00%

[a] Some land-cover types are present in the study area (see Figure 2-2) but not in the Plan Area (e.g., juniper).

[b] Land-cover types were derived from CALVEG, FRAP Multi-Source, and SFEI Baylands sources. Land-cover totals by facility type were derived by overlapping facility boundaries with mapped land-cover types.

[c] Total acreage does not include unmapped facilities, new facilities, or mitigation lands and therefore does not match Table 1-1. Unmapped facilities are expected to occur in proportion to the land-cover type for mapped facilities; new facilities are expected to occur predominantly in natural lands; and mitigation lands are expected to occur in natural lands.

PG&E derived land-cover types from CALVEG, FRAP Multi-Source, and SFEI Baylands data sources. This data was augmented by habitat data developed for regional conservation plans (as described in Section 2.3.4, *Species Habitat Models,* and shown in Figure 2-3). Together, these data sets provide the broadest, highest resolution land-cover data currently available, although the urban growth boundaries reflect growth only since 2001. More recent urban data was not used because the data resolution was too low and had the potential to eliminate natural land-cover types. Plan Area land-cover types that may be understated are riparian areas, wetlands, and coastal dunes because these areas are often smaller than the minimum mapping unit in the available land-cover data used for purposes of this analysis.

2.3 Covered Species

2.3.1 Covered Wildlife

The Plan Area includes 18 wildlife species as determined by the screening process described in Chapter 1, *Introduction*. Because some of the wildlife species only occur within specific and localized habitat types, PG&E worked with USFWS and CDFW to create "hot zones" for these select covered species. Hot zones are defined as areas containing a known localized population of covered species with a small and well-defined range, and where species would be most likely to be affected should covered activities be implemented there. Hot zones were created for California freshwater shrimp, Bay checkerspot butterfly, Lange's metalmark butterfly, longhorn fairy shrimp, Mission blue butterfly, San Bruno elfin butterfly, California tiger salamander (in the Santa Rosa Plain, a portion of Solano County, and Palo Alto), San Francisco garter snake, and Ridgway's rail and salt marsh harvest mouse. PG&E has created maps of these areas, added them to its GIS system, and would utilize the maps to identify sensitive areas and prescribe appropriate AMMs.

2.3.2 Covered Plants

The Plan Area includes 13 covered plant species as determined by the screening process described in Chapter 1, *Introduction*. Covered plant species cannot be categorized as broadly or narrowly distributed, because plants that are broadly distributed may have small, highly localized occurrences. Similarly, plants with a narrow range may be relatively widespread throughout that range. Because plants are immobile and often restricted by specific habitat requirements, it is relatively easy to predict whether or not a covered activity would impact known populations or critical habitat by evaluating the proximity of the facilities to known covered species habitat. PG&E has created "Map Book zones" for covered plants. A Map Book zone is defined as an area of occupied or potentially occupied covered plant species habitat as determined by PG&E botanical surveys. PG&E conducted aerial photo reviews and surveyed for covered plants in areas where plants have been previously identified to locate covered plant populations and prescribe appropriate AMMs. These surveys were conducted during the appropriate floristic and blooming periods, and PG&E marked facilities in Map Book zone areas to help crews avoid impacts.

2.3.3 Species Accounts

PG&E has provided basic life history information for each covered species at the beginning of the impact analysis (Chapter 4, *Covered Species Impact Analysis*) to help the reader understand how PG&E's covered activities could impact covered species. Further, PG&E developed species accounts

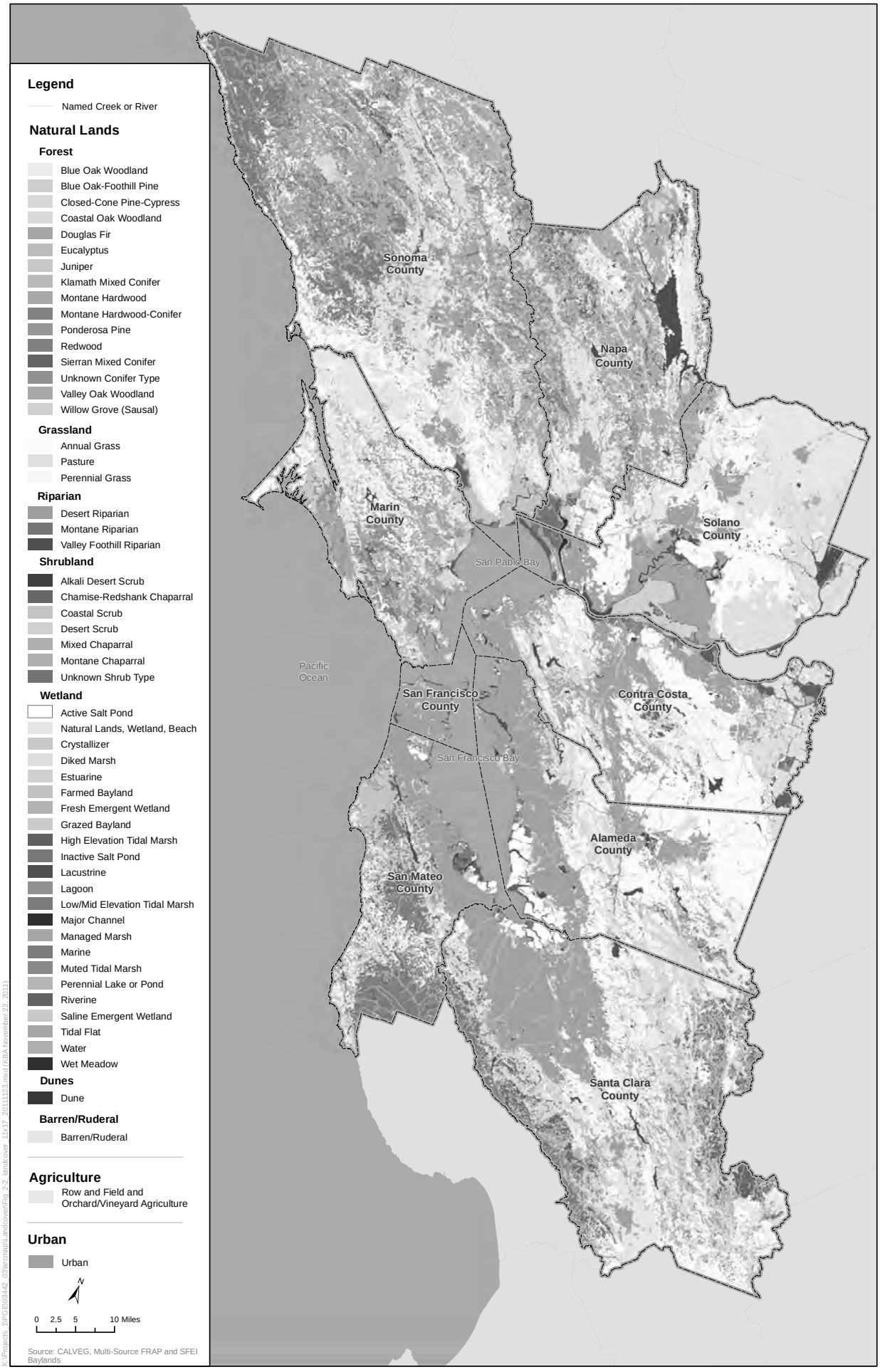

Figure 2-2a
Land-Cover Types in the Study Area

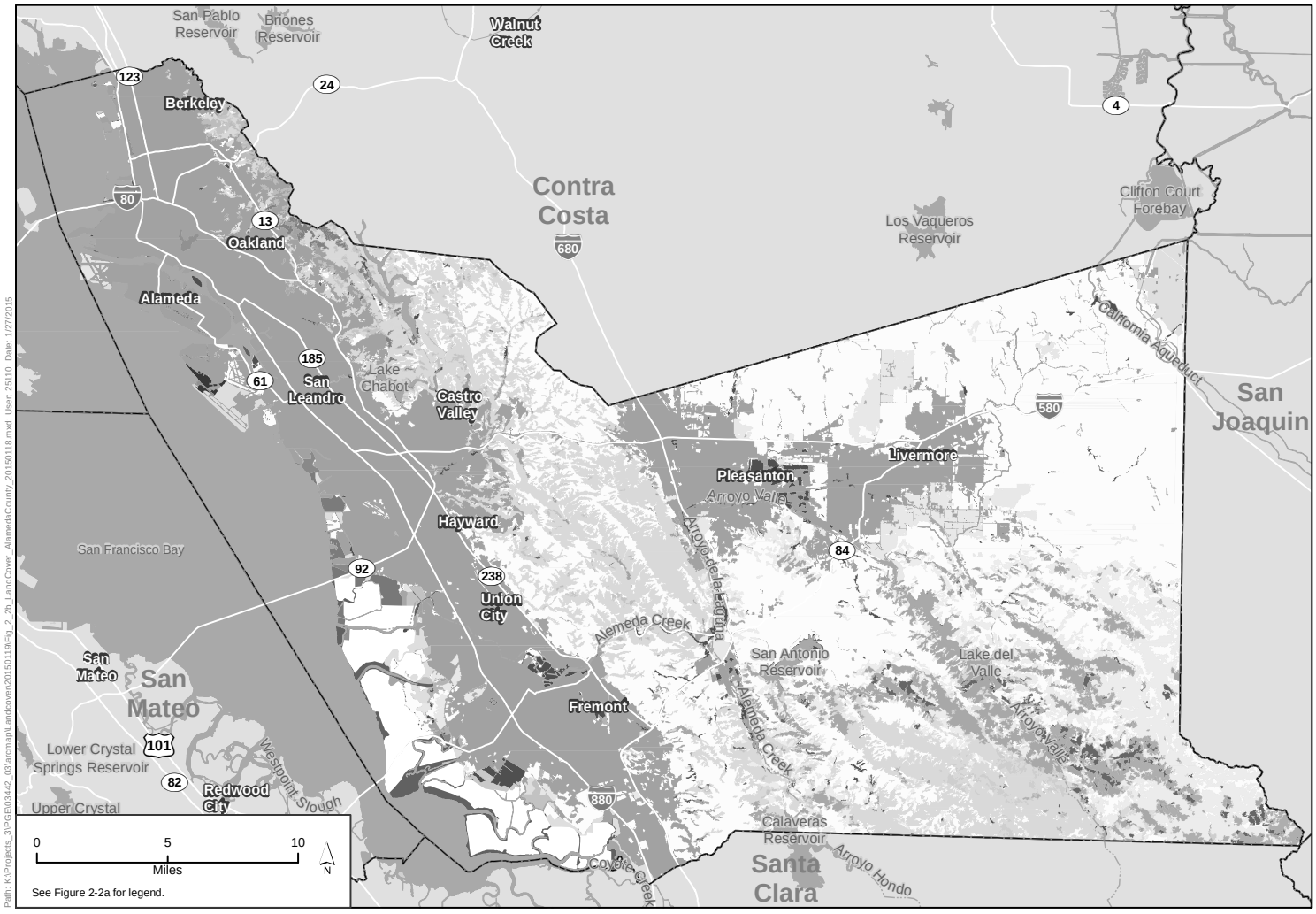

Figure 2-2b
Land-cover Types in Alameda County

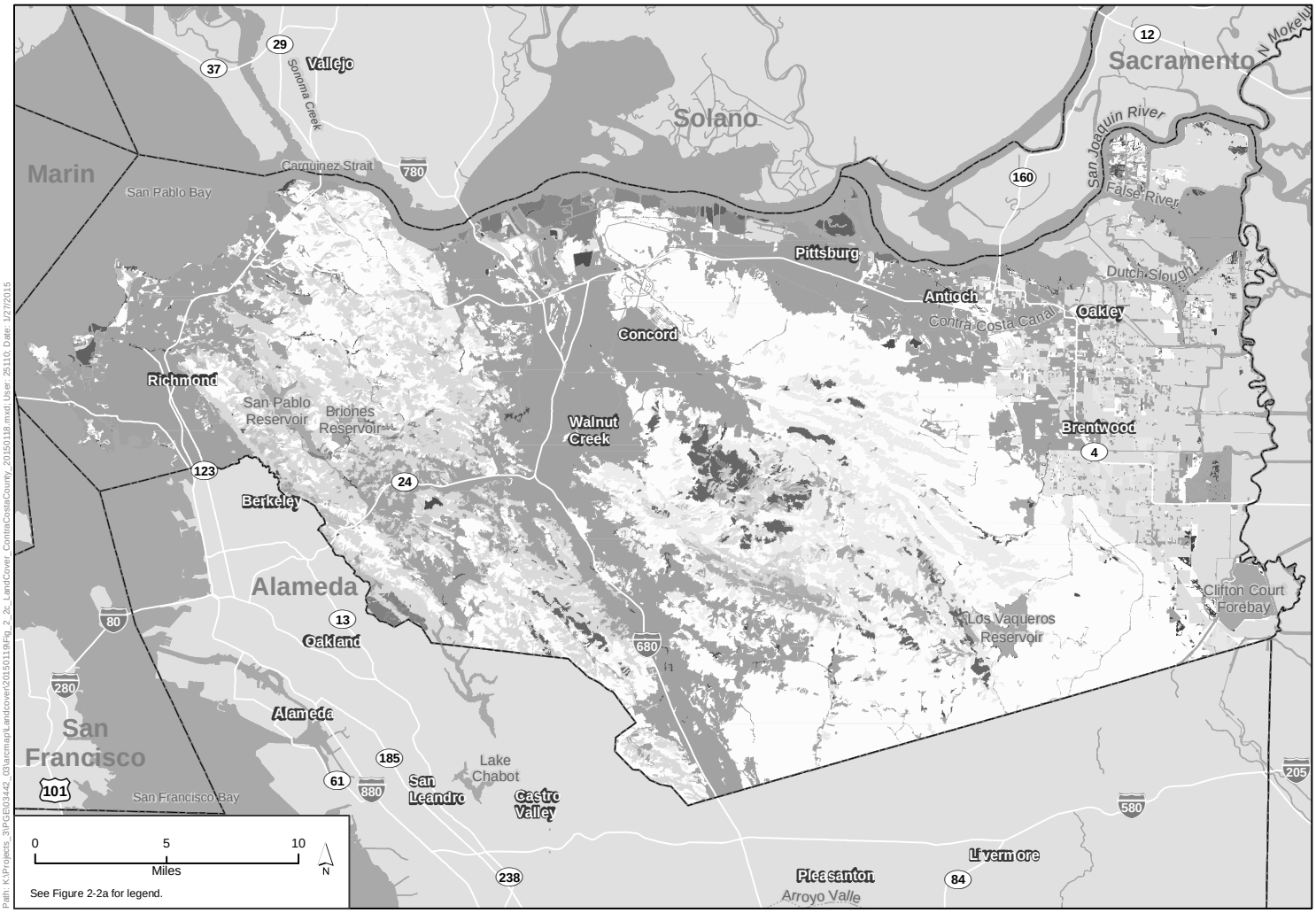

Figure 2-2c
Land-cover Types in Contra Costa County