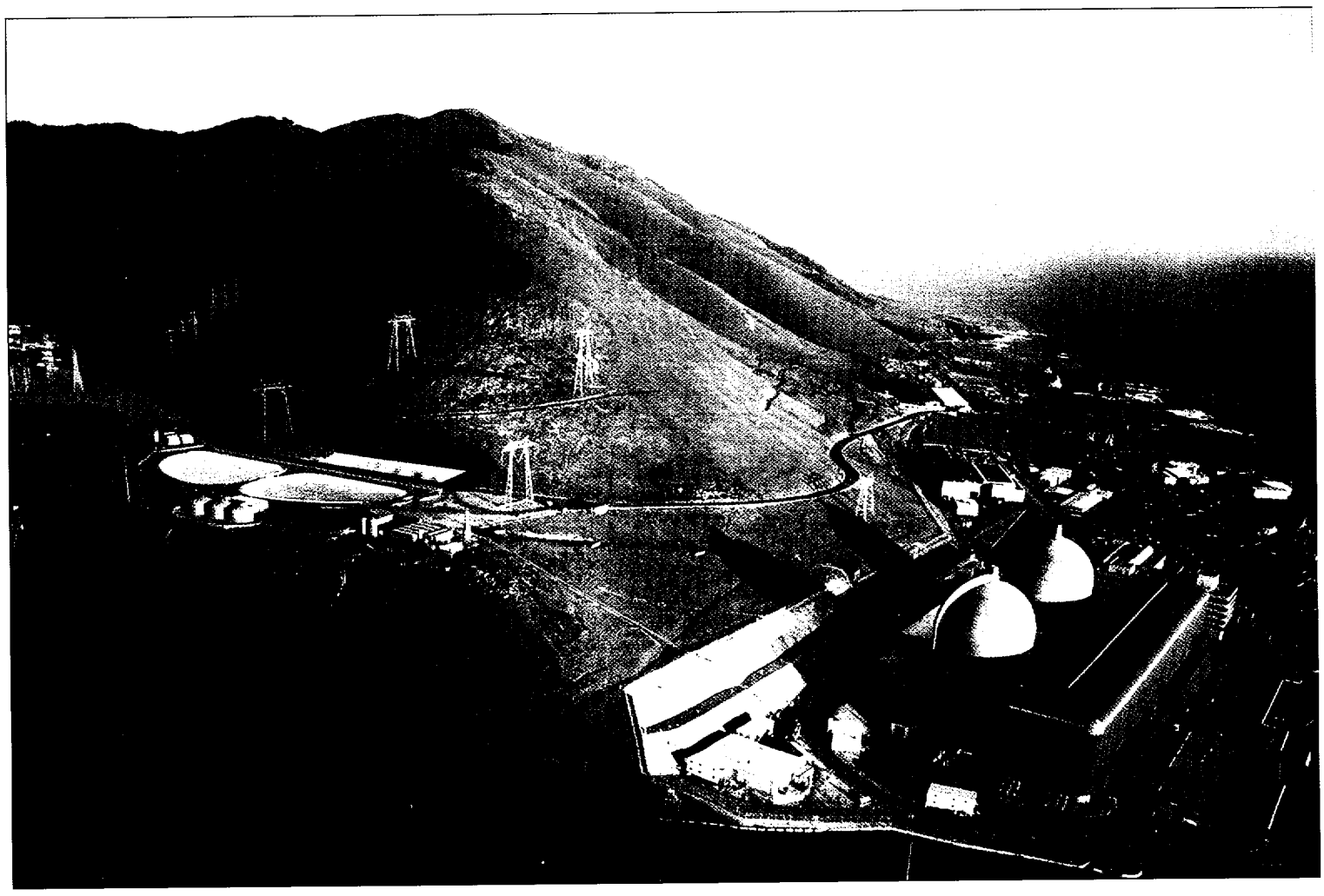
DOCKET NO. 72-26

DIABLO CANYON

INDEPENDENT SPENT FUEL STORAGE INSTALLATION



ENVIRONMENTAL REPORT

PG&E

PACIFIC GAS AND ELECTRIC COMPANY

DIABLO CANYON ISFSI
ENVIRONMENTAL REPORT

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GLOSSARY

A glossary of most of the terms and acronyms used in this environmental report, including their frequently used variations, is presented in this section as an aid to readers and reviewers.

Accident Events means events that are considered to occur infrequently, if ever, during the lifetime of the facility. Natural phenomena, such as earthquakes, tornadoes, floods, and tsunami, are considered to be accident events.

ALARA means as low as is reasonably achievable.

ADE means annual dose equivalent.

APCD means Air Pollution Control District.

AREOR means Annual Radiological Environmental Operating Report.

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of "waters of the United States." BMPs also include treatment requirements, operating procedures, and practices to control plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.

Boral is a generic term to denote an aluminum-boron carbide cermet manufactured in accordance with U.S. Patent No. 4027377. The individual material supplier may use another trade name to refer to the same product.

CAL OSHA means California Occupational Safety and Health Administration.

Cask Transporter (or Transporter) is a U-shaped tracked vehicle used for lifting, handling, and onsite transport of loaded overpacks and transfer casks.

CDF&G means California Department of Fish and Game.

CDP means coastal development permit.

CEDE means committed effective dose equivalent.

CEQA means California Environmental Quality Act.

CFR means Code of Federal Regulations.

CIMIS means the California Irrigation Management Information System.

GLOSSARY

CoC means a certificate of compliance issued by the NRC that approves the design of a spent fuel storage cask design in accordance with Subpart L of 10 CFR 72.

Confinement Boundary means the outline formed by the sealed, cylindrical enclosure of the multi-purpose canister (MPC) shell welded to a solid baseplate, a lid welded around the top circumference of the shell wall, the port cover plates welded to the lid, and the closure ring welded to the lid and MPC shell providing the redundant sealing.

Confinement System means the MPC that encloses and confines the spent nuclear fuel during storage.

Controlled Area (or Owner-Controlled Area) means the area, outside the restricted area but inside the site boundary, for which access to can be limited by PG&E.

Cooling Time for a spent fuel assembly is the time between its discharge from the reactor (reactor shutdown) and the time the spent fuel assembly is loaded into the MPC.

CPP means coastal plan policies.

CTF means the cask transfer facility. The CTF is used in the transfer of an MTC from a transfer cask to a storage cask following transport from the FHB/AB and prior to moving the loaded overpack to the storage pad. The CTF can also be used to transfer an MTC from a loaded overpack to the transfer cask for transport back to the FHB/AB.

CWHR means the California Wildlife Habitat Relationships Program.

CZLUD means coastal zone land use ordinance.

dB(A) means decibels (on the A-weighted scale).

DBE means design basis earthquake.

DCSS means dry cask storage system.

Damaged Fuel Assembly is a fuel assembly with known or suspected cladding defects, as determined by review of records, greater than pinhole leaks or hairline cracks; empty fuel rod locations that are not replaced with dummy fuel rods; or those that cannot be handled by normal means. Fuel assemblies that cannot be handled by normal means due to fuel cladding damage are considered fuel debris.

GLOSSARY

Damaged Fuel Container (or Damaged Fuel Canister or DFC) means a specially designed enclosure for damaged fuel or fuel debris that permits gaseous and liquid media to escape from the container to the MPC while minimizing dispersal of gross particulates. The damaged fuel container/canister (DFC) features a lifting location that is suitable for remote handling of a loaded or unloaded DFC.

DCPP means Diablo Canyon Power Plant.

DCPP FSAR Update means the FSAR for DCPP that is maintained up-to-date in accordance with 10 CFR 51.71(e).

DDE means double design earthquake or deep dose equivalent.

DE means design earthquake.

DHS means Department of Health Services.

Diablo Canyon ISFSI (or ISFSI) means the total Diablo Canyon storage and includes the HI-STORM System, transporter, CTF, storage pads, and ancillary equipment.

DOE means the US Department of Energy.

EIR means environmental impact report.

Enclosure Vessel (EV) means the pressure vessel defined by the cylindrical shell, baseplate, port cover plates, lid, and closure ring that provides confinement for the helium gas contained within the MPC. The enclosure vessel and the fuel basket together constitute the MPC.

FHB/AB means fuel handling building/auxiliary building.

FSAR means final safety analysis report.

Fuel Basket means a honeycombed structural weldment with square openings that can accept a fuel assembly of the type for which it is designed.

Fuel Debris refers to ruptured fuel rods, severed rods, loose fuel pellets, or fuel assemblies with known or suspected defects that cannot be handled by normal means due to fuel cladding damage.

HE means Hosgri earthquake.

GLOSSARY

High Burnup Fuel is a spent fuel assembly with an average burnup greater than 45,000 MWD/MTU.

HI-STORM 100 Overpack (or Loaded Overpack or Storage Cask) means the cask that receives and contains the sealed MPCs (containing spent nuclear fuel and nonfuel hardware) for final storage on the storage pads. It provides the gamma and neutron shielding, ventilation passages, missile protection, and protection against natural phenomena and accidents for the MPC.

HI-STORM 100 System consists of, for the Diablo Canyon ISFSI, the Holtec International MPC, 100SA overpack, and HI-TRAC transfer cask.

HI-STORM 100SA Overpack is a variant of the HI-STORM 100 overpack that is shorter, has a redesigned top lid, and is outfitted with an extended baseplate and gussets to enable the overpack to be anchored to the storage pad. The 100SA overpack is designed for high-seismic applications and will be used at the Diablo Canyon ISFSI.

HI-TRAC 125D Transfer Cask (or HI-TRAC Transfer Cask or HI TRAC or Transfer Cask) means the cask used to house the MPC during MPC fuel loading, unloading, drying, sealing, and onsite transfer operations to an overpack. The HI-TRAC shields the loaded MPC allowing loading operations to be performed while limiting radiation exposure to personnel. The HI-TRAC is equipped with a pair of lifting trunnions to lift and downend/upend the HI-TRAC with a loaded MPC. The HI-TRAC 125D is like the HI-TRAC 125 but without lower trunnions and with a broader bottom flange surface to facilitate impact limiter and MPC transfer devices.

Holtite is a trademarked Holtec International neutron shield material.

Important to Safety (ITS) means a function or condition required to store spent nuclear fuel safely; to prevent damage to spent nuclear fuel during handling and storage; and to provide reasonable assurance that spent nuclear fuel can be received, handled, packaged, stored, and retrieved without undue risk to the health and safety of the public. This definition is used to classify structures, systems, and components of the ISFSI as important to safety (ITS) or not important to safety (NITS).

Independent Spent Fuel Storage Installation (ISFSI) means a facility designed, constructed, and licensed for the interim storage of spent nuclear fuel and other radioactive materials associated with spent fuel storage in accordance with 10 CFR 72. For Diablo Canyon, this term is clarified to mean the total storage system and includes the HI-STORM 100 System, transporter, CTF, storage pads, and ancillary equipment.

Insolation means incident solar radiation.

GLOSSARY

Intact Fuel Assembly is defined as a fuel assembly without known or suspected cladding defects greater than pinhole leaks and hairline cracks, and which can be handled by normal means. Partial fuel assemblies, that is fuel assemblies from which fuel rods are missing, shall not be classified as intact fuel assemblies unless dummy fuel rods are used to displace an amount of water greater than or equal to that displaced by the original fuel rod(s).

Keystone Species means a species capable of having a major influence on community structure, often in excess of that expected from its relative abundance.

LAR means license amendment request.

LCP means local coastal program.

LDE means lens dose equivalent.

License Life means the duration that the HI-STORM 100 System and the Diablo Canyon ISFSI are authorized by virtue of certification by the US NRC.

LPZ means low population zone.

LTSP means long-term seismic program.

LUE means Land Use Element.

Maximum Reactivity means the highest possible k-effective including bias, uncertainties, and calculational statistics evaluated for the worst-case combination of fuel basket manufacturing tolerances.

MEMP means marine environmental monitoring program.

Moderate Burnup Fuel is a spent fuel assembly with an average burnup less than or equal to 45,000 MWD/MTU.

MPC-24 means the Holtec MPC designed to store up to 24 intact PWR fuel assemblies and associated nonfuel hardware.

MPC-24E means the Holtec MPC designed to store up to 24 PWR fuel assemblies and associated nonfuel hardware, 4 of which can be damaged fuel assemblies in designated fuel basket locations, with the balance being intact fuel assemblies.

GLOSSARY

MPC-24EF means the Holtec MPC designed to store up to 24 PWR assemblies and associated nonfuel hardware, 4 of which can be damaged fuel assemblies in designated fuel basket locations, or damaged fuel containers (DFCs) containing fuel debris in designated fuel basket locations, with the balance being intact fuel assemblies.

MPC-32 means the Holtec MPC designed to store up to 32 intact PWR fuel assemblies and associated nonfuel hardware.

MSL means mean sea level.

MTU means metric tons of uranium.

Multi-Purpose Canister (MPC) means the sealed canister that consists of a honeycombed fuel basket contained in a cylindrical canister shell that is welded to a baseplate, lid with welded port cover plates, and closure ring. The MPC is the confinement boundary for storage conditions.

MWD/MTU means megawatt-days per metric ton of uranium.

NEPA means the National Environmental Policy Act of 1969 including any amendments thereto.

Neutron Shielding means a material used to thermalize and capture neutrons emanating from the radioactive spent nuclear fuel.

NFPA means National Fire Protection Association.

NPDES means national pollutant discharge elimination system.

NRC means the US Nuclear Regulatory Commission.

NRHP means National Register of Historic Places.

NSOC means the DCPP Nuclear Safety Oversight Committee.

NWPA means the Nuclear Waste Policy Act of 1982 and any amendments thereto.

OBE means operating basis earthquake.

PFSF means Private Fuel Storage Facility.

PFSLLC means Private Fuel Storage Limited Liability Corporation.

GLOSSARY

PMF means probable maximum flood.

Post-Core Decay Time (PCDT) is synonymous with cooling time.

Protected Area (or ISFSI Protected Area) means the area within the security fence that circumscribes the storage pads.

Protected Area Boundary means the security fence that circumscribes the storage pads.

PSRC means the DCPP Plant Staff Review Committee.

PWR means pressurized water reactor.

Reactivity is used synonymously with effective neutron multiplication factor or k-effective.

REMP means radiological environmental monitoring program.

Restricted Area means the area within the second fence circumscribing the storage pads, access to which is limited by PG&E for the purpose of protecting individuals against undue risks from exposure to radiation and radioactive materials.

Restricted Area Fence means the second fence that circumscribes the storage pads. It is located to ensure the dose rate at this boundary will be less than 2 mrem/hr in compliance with 10 CFR 20 requirements.

RWMP means receiving water monitoring program.

RWQCB means Regional Water Quality Control Board.

SAR means safety analysis report.

SAT means systematic approach to training.

SDE means shallow dose equivalent.

Security Fence is the first fence circumscribing the storage pads.

SFP means spent fuel pool.

Site Vicinity means the area contained within a 5-mile radius of the ISFSI.

GLOSSARY

SNF or Spent Fuel means spent nuclear fuel. Per 10 CFR 72.3, spent fuel includes the special nuclear material, byproduct material, source material, and other radioactive materials associated with fuel assemblies. As described in NUREG-1567, other radioactive materials associated with spent fuel assemblies include rod cluster control assemblies, burnable poison (rod) assemblies, thimble plugging assemblies, and primary and secondary source assemblies (these type items are termed nonfuel hardware at DCPP).

SSC means structures, systems, and components.

SSE means safe shutdown earthquake.

TEDE means total effective dose equivalent.

TEMP means thermal effects monitoring program.

Thermosiphon is the term used to describe the buoyancy-driven natural convection circulation of helium within the MPC fuel basket.

TLD means thermoluminescent dosimeters.

TODE means total organ dose equivalent.

Transport route means the route to be used by the cask transporter for onsite transfer of the loaded HI-TRAC cask from the FHB/AB via Plant View Road, Shore Cliff Road, and Reservoir Road to the CTF.

USGS means the US Geological Survey.

UTM means Universal Transverse Mecator and is used to define topographic locations in metric coordinates.

Westinghouse LOPAR fuel assemblies have been used at DCPP and are one of the types of spent fuel that will be stored at the ISFSI.

Westinghouse VANTAGE 5 fuel assemblies have been used at DCPP and are one of the types of spent fuel that will be stored at the ISFSI.

χ/Q means site-specific atmospheric dispersion factors used in radiological dose calculations for normal and accidental releases.

ZPA means zero period acceleration.

CHAPTER 1

PROPOSED ACTIVITIES

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CHAPTER 1

PROPOSED ACTIVITIES

This chapter provides background information on the Diablo Canyon Power Plant (DCPP), the need for the Diablo Canyon Independent Spent Fuel Storage Installation (ISFSI), and the schedule for licensing and constructing the Diablo Canyon ISFSI. Information pertaining to DCPP and the ISFSI site was taken from Chapters 1 and 2 of the DCPP Final Safety Analysis Report Update (Reference 1). Other documents that are on file with the Nuclear Regulatory Commission (NRC) and referenced throughout this Environmental Report (ER) are listed in Section 1.4.

1.1 BACKGROUND

DCPP consists of two nuclear generation units located on the California coast approximately 6 miles northwest of Avila Beach, California. The two units are essentially identical pressurized water reactors (PWRs), each rated at a nominal 1,100 megawatts-electric. The two units share an auxiliary building as well as certain components of auxiliary systems. The reactors, including their nuclear steam supply systems, were furnished by Westinghouse Electric Corporation. Each reactor has a dedicated fuel handling system and spent fuel storage pool. Both units and the plant site are owned and operated by PG&E.

Unit 1 began commercial operation in May 1985 and Unit 2 in March 1986. The operating licenses expire in September 2021 for Unit 1 and April 2025 for Unit 2. In general, the operating and spent fuel storage histories of DCPP Unit 1 and Unit 2 are similar to those of other PWRs. The spent fuel storage racks were initially of low-density design, capable of accommodating only one and one-third cores of spent fuel assemblies. These low-density racks were replaced in the late 1980s with high-density racks that are currently in use.

The spent fuel pool for each unit presently has sufficient capacity for the storage of 1,324 fuel assemblies. Each reactor core contains 193 fuel assemblies, and both units are currently operating on 18- to 21-month refueling cycles. Typically, 76 to 96 spent fuel assemblies are permanently discharged from each unit after a refueling. Each unit has operated for 10 fuel cycles and each is presently operating in its 11th cycle. Based on the existing inventory and the expected generation of spent fuel, each spent fuel pool can accommodate the concurrent storage of a full core of irradiated fuel and the anticipated quantity of spent fuel generated from prior refueling operations until 2006. After that time, an alternative means of spent fuel storage at DCPP must be provided unless the spent fuel can be shipped offsite.

1.2 NEED FOR THE FACILITY

The Nuclear Waste Policy Act (NWPA) of 1982 mandated that the Department of Energy (DOE) assume responsibility for the permanent disposal of spent nuclear fuel from the nation's commercial nuclear power plants. Pending the availability of a permanent DOE repository, nuclear power plant operators such as PG&E have been given the responsibility under the NWPA to provide for the interim onsite storage of spent fuel until it is accepted by DOE. DOE has not complied with its NWPA mandate to have a repository in operation commencing in 1998, and no interim spent fuel storage facility has been established. Moreover, no such DOE facility is expected to become operational in a timeframe to meet the spent fuel storage needs of DCPP. Thus, spent fuel generated by DCPP will need to remain at DCPP until a DOE or other facility is available. Consequently, additional spent fuel storage capacity is needed at DCPP no later than 2006.

The additional capacity to accommodate discharged spent fuel as proposed herein will allow DCPP to continue to generate electricity. Any interruption in the availability of this capacity would almost certainly cause a negative impact on the domestic sector power supply in California. Considering the power supplies in California and in the western United States, as well as uncertainties about future power supplies, any loss of power from DCPP could have significant adverse impacts on the population, the infrastructure, and the economy. Expansion of the onsite spent fuel storage capacity at DCPP as planned by PG&E is necessary to avoid these potential significant negative impacts.

PG&E has considered several alternative means for accommodating the additional spent fuel that will be generated at DCPP through the licensed operating life of each unit. The onsite alternatives include a second reracking of the spent fuel pools to replace the existing high-density racks with racks of higher-density design, and building an onsite ISFSI using dry cask storage technology. PG&E has also considered the possibility of participating in the Private Fuel Storage venture, which has an application pending before the NRC for a license to independently store spent fuel from nuclear power plants.

Based on an overall assessment of operational and safety considerations, the amount of spent fuel to be generated, the transportation requirements associated with the alternatives, resources needed, and scheduling restraints, PG&E has concluded that dry cask storage of spent fuel at DCPP is the best available method at this time for providing the necessary storage capacity. However, as discussed below, increasing the spent fuel pool storage capacity through a second reracking with higher density racks remains a viable option if it appears that the Diablo Canyon ISFSI cannot be licensed on a schedule that meets PG&E storage requirements.

The expanded storage capacity provided by the use of dry casks at the ISFSI will be used to store aged spent fuel that has been stored for 5 years or longer in the DCPP spent fuel pools. The storage spaces in the respective spent fuel pools that become available following this transfer of the aged spent fuel into dry cask storage then can be used to store future discharged

spent fuel from the reactor core. Storage casks will be acquired as needed to accommodate the spent fuel generated until shipment offsite occurs.

The Diablo Canyon ISFSI will consist of: the storage pads, a cask transfer facility (CTF), an onsite cask transporter, and the dry cask storage system. The dry cask storage system that has been selected by PG&E for the Diablo Canyon ISFSI is the Holtec International (Holtec) HI-STORM 100 System (Reference 2). The HI-STORM 100 System is comprised of a multi-purpose canister (MPC), the storage overpack, and the HI-TRAC transfer cask. The HI-STORM 100 System is certified by the NRC for use by general licensees as well as site-specific licensees, presently with a 24 PWR fuel assembly MPC and storage overpack (NRC 10 CFR Part 72 Certificate of Compliance [CoC] No. 1014) (Reference 3).

Holtec has proposed a number of changes to the certified HI-STORM 100 System in License Amendment Request (LAR) 1014-1, submitted to the NRC on August 31, 2000 (Reference 4). These proposed changes include a HI-STORM 100SA storage overpack, a higher-capacity MPC-32 design (for storage of 32 PWR spent fuel assemblies), and MPC designs with different fuel storage capabilities (for example, high burnup fuel and certain damaged fuel). As discussed below, several of these proposed changes are desirable for the Diablo Canyon ISFSI. PG&E understands, however, that several of the proposed changes in LAR 1014-1, such as the designs to accommodate high burnup fuel, may involve extensive NRC review. As discussed below, issuance of a revised CoC (1014-1) may not necessarily be required to support the plant-specific Diablo Canyon ISFSI license.

The Diablo Canyon ISFSI is designed to hold up to 140 storage casks (138 casks plus 2 spare locations). Based on the current fuel strategy and use of the MPC-32, the ISFSI with a storage pad capacity of 140 casks will be capable of storing the spent fuel generated by DCPP Units 1 and 2 over the term of the current operating licenses (2021 and 2025, respectively). Because of its higher capacity, the principal MPC to be used will be the MPC-32. In addition, to accommodate spent fuel generated during the licensed period, as well as any damaged fuel assemblies, debris, and nonfuel hardware, PG&E may use three other MPC designs from the HI-STORM 100 System: the MPC-24, MPC-24E, and MPC-24EF. All four MPC designs use the same storage overpack and are either licensed by current CoC No. 1014 or will be licensed by future revisions to CoC No. 1014. These cask designs will accommodate most of the DCPP-specific fuel characteristics.

The PG&E license application incorporates these designs in a preferred cask system licensing approach as follows:

(1) The initial Diablo Canyon ISFSI site-specific license would incorporate the MPC capabilities as specified in CoC No. 1014, as proposed to be amended in Holtec LAR 1014-1. The NRC is anticipated to issue a final technical review on LAR 1014-1 and a preliminary Safety Evaluation Report in late December 2001 or early 2002. Rulemaking is expected to be completed in mid-2002. While the MPC capabilities covered by the Holtec CoC No. 1014 and LAR

1014-1 will not completely envelope all of the spent fuel characteristics eventually needed for storage of DCPP fuel, they will cover most of the current spent fuel pool inventory and will permit the storage of nearly all spent fuel and associated nonfuel hardware generated through the license term.

(2) MPC designs that may be needed to store the balance of the DCPP spent fuel will be addressed in future revisions to the CoC. As these changes are submitted by Holtec and approved by the NRC, PG&E will amend the Diablo Canyon ISFSI site-specific license to incorporate these changes. The resulting capability will provide PG&E with the flexibility to store onsite all of the spent fuel and nonfuel hardware from DCPP Units 1 and 2 generated during the term of its operating licenses.

(3) In a Federal Register Notice dated October 11, 2001 (66 FR 51823), NRC issued the final rule change regarding greater than class C (GTCC) waste (for example, split pins and thimble tubes). The rule change applies only to the interim storage of GTCC waste generated or used by commercial nuclear power plants. The rule change allows interim storage of reactor-related GTCC wastes under a 10 CFR 72 site-specific license. In accordance with the guidance of ISG 17, PG&E plans to request a modification to its proposed site-specific license at a future date to allow interim storage of GTCC wastes at the Diablo Canyon ISFSI.

Licensing of the Diablo Canyon ISFSI also involves NRC review of a number of site-specific issues. They include the site-specific environmental review, geotechnical issues related to the site, site-specific environmental conditions and natural phenomena, and other site-specific matters. Although the Holtec LAR 1041-1 includes a high-seismic capability for the storage overpack (the HI-STORM 100SA), it does not incorporate some Diablo Canyon specific information (for example, the pad design, the overpack seismic anchorage design, the cask transporter seismic design, and the CTF design). PG&E is submitting information on these items as part of this site-specific application and intends that these issues be reviewed and licensed as part of the PG&E site-specific 10 CFR 72 license.

In addition to the approval from the NRC under 10 CFR Part 72, other state and local permits and licenses will be required to support the construction and operation of the Diablo Canyon ISFSI, as discussed in ER Chapter 9. With respect to the State of California, PG&E will apply for a Coastal Development Permit (CDP). The CDP application will require an environmental review in accordance with State law. The County of San Luis Obispo acts as the lead agency. PG&E initiated the necessary state environmental review process in November 2001 and encourages NRC coordination with the County. This Environmental Report is being written to address the requirements of the National Environmental Policy Act and the California Environmental Quality Act.

Separate and apart from the present 10 CFR 72 application, PG&E intends to submit a 10 CFR 50 LAR for DCPP Units 1 and 2 in early 2002 related to cask handling activities in the DCPP fuel handling building/auxiliary building (FHB/AB). PG&E also submitted a 10 CFR 50 LAR on September 13, 2001, to allow credit for soluble boron in the DCPP spent fuel pools and thus provide additional storage in the existing high-density racks. Credit for soluble boron will extend full core offload capability in the spent fuel pools from 2003 to 2006.

PG&E has evaluated the above proposed actions and has determined that the proposed actions and mitigating measures do not involve: (a) a significant hazards consideration, (b) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (c) a significant increase in individual or cumulative occupational radiation exposure. This document should allow federal and state agencies to conclude that PG&E proposed actions to implement a used fuel storage program consisting of a 10 CFR 72 license application and modification to the DCPP 10 CFR 50 operating license do not involve any significant adverse environmental impacts.

In its Waste Confidence Decision, the NRC examined the environmental impacts of the operation of ISFSIs built at operating nuclear power plant sites. The Commission has made a generic determination that, if necessary, spent fuel generated in any reactor can be stored without significant environmental impacts for at least 30 years beyond the licensed life for operation of that reactor at onsite or offsite ISFSIs (10 CFR 51.23: 49 Fed. Reg. 34688, August 31, 1984). The NRC has reviewed the Waste Confidence decision twice since it was first issued (in 1990 [55 Fed. Reg. 38474, September 18, 1990] and in 1999 [64 Fed. Reg. 68005, December 6, 1999]), and in both cases, the Commission basically reaffirmed the findings of the original decision. On July 18, 1990, the NRC published a final rule on "Storage of Spent Nuclear Fuel in NRC-Approved Storage Casks at Nuclear Power Plant Sites" (55 Fed. Reg. 29181-29190, July 18, 1990), and issued a general license for storage of spent nuclear fuel at reactor sites (10 CFR 72.210). The environmental impacts of spent nuclear fuel storage at reactor sites were also addressed in an environmental assessment and its accompanying "finding of no significant impact" (NRC 1989). The finding of no significant impact states that the Commission concludes that the proposed rulemaking, entitled "Storage of Spent Nuclear fuel in NRC-Approved Storage Casks at Nuclear Power Reactor Sites," will not have a significant incremental impact on the quality of the human environment. In addition, the NRC has issued seven site-specific licenses for at-reactor ISFSIs located in various parts of the country. For these seven ISFSIs, environmental assessments were completed and findings of no significant impact were reached.

1.3 PROPOSED PROJECT SCHEDULE

In order to support the operational needs for continued Diablo Canyon operation, PG&E requests that the Diablo Canyon ISFSI license be issued by December 2003. The PG&E schedule for constructing and operating the Diablo Canyon ISFSI is dependent upon the timely completion of the NRC environmental review process and timely technical reviews of the site-specific license application. With the submittal of the Diablo Canyon ISFSI license application in 2001, and based on a review of other applicants licensing schedules, PG&E believes that the review process at the NRC can be completed in approximately 2 years. Assuming no delays in the review process, and NRC issuance of the Diablo Canyon ISFSI license in 2003, PG&E plans to have the Diablo Canyon ISFSI in full operational status with initial placement of fuel in storage casks in 2005. This schedule provides a contingency period to ensure the Diablo Canyon ISFSI operation by 2006.

PG&E emphasizes that meeting the storage needs by 2006 is essential for continued DCPP operation. If the licensing schedule for the Diablo Canyon ISFSI cannot support that need with assurance, PG&E will need to reevaluate other alternatives for spent fuel storage. PG&E is presently maintaining the option of reracking the spent fuel pools to provide additional storage with full core offload capability past 2006. However, the lead time to implement this alternative is significant. Accordingly, PG&E needs to determine promptly the feasibility of licensing the Diablo Canyon ISFSI on the required schedule, and therefore requests an expedited NRC decision on the feasibility of the licensing approach and schedule outlined above.

Initial site characterization and storage system design activities have been conducted for the Diablo Canyon ISFSI. PG&E does not plan to initiate extensive facility construction activities until the NRC environmental review is completed, permits are obtained, and the Diablo Canyon ISFSI license has been issued or the necessary environmental findings made. Thus, Diablo Canyon ISFSI construction work is not expected to begin until 2004 at the earliest. Nonetheless, pending NRC approval of the Diablo Canyon ISFSI license application, PG&E intends to proceed with relatively minor site preparation activities, such as infrastructure development and access road work and is in the process of obtaining the appropriate permits from other agencies for such work.

1.4 REFERENCES

The following documents are already on file with the NRC and referenced throughout this ER:

1. Diablo Canyon Power Plant Units 1 & 2 Final Safety Analysis Report Update, Revision 14, November 2001.

2. Final Safety Analysis Report for the HI-STORM 100 System, Holtec International Report No. HI-2002444, Revision 0, July 2000.

3. 10 CFR 72 Certificate of Compliance No. 1014 for the HI-STORM 100 System, Holtec International, Revision 0, May 2000.

4. License Amendment Request 1014-1, Holtec International, Revision 2, July 2001 including Supplements 1 through 4 dated August 17, 2001; October 5, 2001; October 12, 2001; and October 19, 2001; respectively.

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2.1 SITE LOCATION

The ISFSI will be located within the PG&E owner-controlled area at Diablo Canyon, which consists of approximately 760 acres of land located in San Luis Obispo County, California, adjacent to the Pacific Ocean and roughly equidistant from San Francisco and Los Angeles. The boundary of this area is used for the analyses required in accordance with 10 CFR 72.104 and 72.106. This area is located along the coast of California in San Luis Obispo County directly southeast of Montana de Oro State Park and is approximately 12 miles west-southwest of the city of San Luis Obispo, the county seat and the nearest significant population center.

The nearest residential community is Los Osos, approximately 8 miles north of the ISFSI site. This community is located in a mountainous area adjacent to Montana de Oro State Park. The township of Avila Beach is located down the coast at a distance of approximately 6 miles southeast of the ISFSI site. The city of Morro Bay is located up the coast approximately 10 miles northwest of the site. A number of other cities, as well as some unincorporated residential areas, exist along the coast and inland. However, these are at distances greater than 8 miles from the ISFSI site. Only a few individuals reside within 5 miles of the ISFSI site.

The DCPP facilities and the ISFSI site are located near the mouth of Diablo Creek, and a portion of the power plant site is bounded by the Pacific Ocean. Approximately 165 acres of the owner-controlled area are located north of Diablo Creek. The remaining 595 acres are located adjacent to and south of Diablo Creek. The entire acreage is owned by PG&E.

The ISFSI is located at latitude 35°12'52" North and longitude 120°51'00" West. The Universal Transverse Mercator (UTM) coordinates of the ISFSI are 695,689 meters East and 3,898,723 meters North. Figure 2.1-1 shows the location of the Diablo Canyon owner-controlled area, including the ISFSI site, on a map of western San Luis Obispo County. Figure 2.1-2 shows a plan drawing of the ISFSI site.

A security fence that defines the ISFSI protected area within the owner-controlled area, which is surrounded by a farm-type fence, controls access to the ISFSI site. PG&E owns all coastal properties north of Diablo Creek, to the southerly boundary of Montana de Oro State Park and inland a distance of 0.5 to 1.75 miles. Similarly, PG&E owns all coastal properties south of Diablo Creek for approximately 8 miles and inland approximately 1.75 miles. Except for the DCPP and ISFSI sites, all of the acreage north and south of DCPP and the ISFSI are encumbered by two grazing leases. In accordance with an agreement in principle reached in 2000 with the Central Coast Regional Water Quality Control Board, land north of DCPP,

consisting of 2,013 acres of watersheds draining to approximately 5.7 miles of coastline, will be preserved forever by a conservation easement for ecological purposes. The primary goal is protection of marine resources from Fields Cove to Coon Creek through watershed and habitat protection of all the lands draining to that coastline. In addition, PG&E will protect 547 acres draining to Coon Creek through Best Management Practices (BMPs) for as long as PG&E operates the plant or holds the property, whichever is longer.

The location of DCPP and related facilities adjacent to the wildland vegetation of the Diablo Creek watershed has necessitated development of a BMP-based fuel management program on watershed lands. The wildland fuel management area is located east of the ISFSI area within the Diablo Creek watershed. The program goals are protection of the power plant site, transmission lines, and workforce population for wildfire. The approach is the management of fuels within the watershed using controlled burning, brush clearing, controlled grazing, and selective application of herbicides. The fuel management program is essential to ensuring the reliability of operation and overall safety at Diablo Canyon. Approximately 400 acres of the Diablo Creek watershed is actively managed using integrated vegetation management techniques to reduce fuel volume and risk of damage to utility structures from fire.

2.2 GEOGRAPHY, LAND USE, AND DEMOGRAPHY

2.2.1 GEOGRAPHY

The ISFSI will be located within the PG&E owner-controlled area at Diablo Canyon. The owner-controlled area occupies a coastal terrace that ranges in elevation from 60 to 1,400 ft above mean sea level (MSL). The DCPP facilities, other than the intake and discharge structures, occupy an area varying between 60 and 150 ft MSL and approximately 1,000 ft wide. The ISFSI is located approximately 0.22 miles northeast of the Unit 1 containment (ISFSI/containment center-to-center) at an elevation of approximately 310 ft MSL (Figure 2.1-2). The seaward edge of the terrace is a near-vertical cliff. Back from the terrace and extending for several miles inland are the rugged Irish hills, an area of steep, brush-covered hillsides and deep canyons that are part of the San Luis Mountains, which attain an elevation of 1,500 ft within about 1 mile of the site. The ISFSI is located between hillsides that are situated on top of bedrock, located directly beneath the site. The coastal areas surrounding the ISFSI are well drained, primarily via Diablo Creek, and the water table is typically low.

The owner-controlled area is not traversed by public highway or railroad. Normal access to the ISFSI site is from the south via a 6.5-mile long private road through the owner-controlled area, which is fenced and posted by PG&E. Avila Beach lies south of the ISFSI immediately adjacent to the owner-controlled area outside the security entrance gate. The private road is connected to a single local public roadway, Avila Beach Drive, which runs along the shoreline of San Luis Obispo Bay. An unmanned US Coast Guard station is located adjacent to the security gate, inside the owner-controlled area.

The major access in the vicinity of the ISFSI and other communities of San Luis Obispo County is via US Highway 101 (including several frontage roads), which generally traverses north-south through San Luis Obispo County. This highway passes about 9 miles east of the ISFSI site and is accessible at approximately 15 miles to the southeast of the site. US Highway 1 also traverses San Luis Obispo County, generally along the coastal areas of California, but joins Highway 101 in the vicinity of San Luis Obispo.

In addition, a paved coastal road from Los Osos through Montana de Oro State Park, which transitions to a dirt road, can be used to access the owner-controlled area from north of the ISFSI site in the event that the southern private access roadway becomes inaccessible. Access from the Pacific Ocean can also be gained to both the ISFSI site area and the main access gate near Avila Beach by barge service and private sea-going vessels. Port San Luis Harbor, located in Avila Beach immediately outside the security entrance gate to the owner-controlled area, serves frequent commercial and recreational boat traffic. Commercial air traffic into and out of San Luis Obispo County is primarily through San Luis Obispo Airport, located approximately 12 miles east of the ISFSI site.

2.2.2 LAND USE

PG&E has full authority to control all activities within the ISFSI site and owner-controlled area boundaries; this authority extends to the mean high water line along the ocean coastline. The mineral rights within the site are owned by PG&E; there is no information suggesting that the land contains commercially valuable minerals. On land, there are no activities unrelated to ISFSI operation within the exclusion area.

The San Luis Range, reaching a height of 1,800 ft, dominates the region between the site and US Highway 101. This upland country is used to a limited extent for grazing beef cattle and, to a very minor extent, dairy cattle. There are also some wild and domestic goats, deer, and other wildlife in the vicinity of the plant site. The terrain east of US Highway 101, lying in the mostly inaccessible Santa Lucia Mountains, is sparsely populated with little development. A large portion of this area is included within the Los Padres National Forest.

San Luis Obispo County has relatively little level land, except for a few small coastal valleys such as the Santa Maria and San Luis Valleys, and some land along the county's northern border in the Salinas Valley and Carrizo Plain areas. Farming is a significant land use in the county. Principal crops include wine grapes, vegetables, cattle, nurseries, fruits, nuts, and grain. There are several vineyards and wineries located in the county. The county's leading agricultural product is wine grapes, valued at approximately $74,000,000 in 1998. The total farm acreage in the county is approximately 1,200,000. The county contains a total of 2,128,640 acres.

The only dairy activity is 12 miles northeast of the site at California Polytechnic State University, located in the city of San Luis Obispo, which produces 1,200 gallons of milk per day. Some replacement heifers and dry cows are intermittently pastured on property adjacent to the site.

There are two public water supply groundwater basins within 10 miles of the ISFSI site. Avila Beach County Water and Sewer District serves Avila Beach. The San Miguelito Mutual Water and Sewer Company provides water to most of the Avila Valley area. Property owned by PG&E captures water from Crowbar Canyon, approximately 1 mile north of the plant site. In addition, an ocean water desalinization plant was built and has been in operation at the site since 1985.

The only agricultural activities indicated by county records are cattle grazing in much of the area surrounding the site, and a farm in the east-southeast sector, producing legumes and cereal grass such as grains. The farm is located along the site access road on the coastal plateau, starting approximately 2 miles from the plant and extending to 4.5 miles from the plant. There is also a household garden greater than 500 square ft in the east sector. These activities are being conducted on land leased from PG&E.

The Diablo Canyon owner-controlled area is located between two fishing harbors that support commercial and sport fishing activities. Port San Luis Harbor is located in Avila Beach, approximately 6 miles downcoast and south of the ISFSI site. Morro Bay Harbor is located approximately 10 miles upcoast of the site. In 1994 the combined sport catch totaled approximately 342,000 rockfish and 6,000 fish of other species, from a total of 16 fishing vessels.

Commercial landings are calculated by poundage of landings by port. In 1994, at Port San Luis and Morro Bay Harbors, the landings were estimated to be as follows: 2,474,000 pounds of rockfish, 5,405,000 pounds of other fish species, 1,300 pounds of abalone, 2,694,000 pounds of squid, 534,000 pounds of crab, 418,000 pounds of shrimp, and 4,400 pounds of urchins.

There has been a dramatic decrease since 1970 in the abalone catch, with approximately 621,000 pounds taken in 1966 and 200,000 pounds taken in 1970, due primarily to severe restrictions imposed by the California Department of Fish and Game. Some data suggest that the southern movement of the southern sea otter may have had an impact on the red abalone population.

Port San Luis Harbor is located in Avila Beach directly opposite the security road entrance that controls entry into the Diablo Canyon owner-controlled area via the 6.5-mile private access road. A small public beach is located next to the harbor area and is used frequently by the public for access to the harbor waters for recreation purposes.

A tanker-loading pier owned by UNOCAL Oil Company is located in San Luis Obispo Bay directly adjacent to the small beach area. Prior to 1999, there were also several UNOCAL oil storage tanks located on the hills immediately southeast of Avila Beach. Approximately 1 to 2 local tankers per month offloaded oil for storage in these tanks until the late 1990s. The tanks were removed in 1998 as a part of an effort by UNOCAL to clean up soil contamination due to oil leaks from piping beneath Avila Beach.

In addition, there is a public beach and pier in Avila Beach that are popular with local residents as well as tourists. Attendance at the beach fluctuates widely depending on season, but can be significant, at times totaling several hundred per day. The beach is popular with students from California Polytechnic State University. A number of businesses in Avila Beach, including restaurants and hotels, cater to beach activities. There is also a resort hotel/condominium complex with a golf course located across Avila Beach Drive from the beach area. Several residential developments are located nearby.

Industry in the communities surrounding the ISFSI site is mainly light and of a local nature serving the needs of agriculture in the area. Food processing and refining of crude oil are the major industries, although the numbers employed are not large. Other businesses and institutions in the area include medical facilities, such as hospitals, clinics, and medical offices; a state correctional facility, located beside US Highway 1 and north of the city of

San Luis Obispo; and numerous tourist-related businesses. The local tourist industry primarily involves beach-going activities, which can be extensive during the warm seasons. However, there is also substantial year-round tourist activity due to attraction of the Hearst Castle, located along Highway 1 approximately 60 miles north of the plant site. This tourist activity, particularly during the summer, causes a noticeable increase to the traffic on Highway 101 in San Luis Obispo County, which connects with Highway 1 approximately 12 miles from the ISFSI.

2.2.3 DEMOGRAPHICS

2.2.3.1 Population Distribution and Trends

The population distribution and projections for areas around the ISFSI site are based on the 2000 census and on estimates prepared by the California Department of Finance. As described in Section 2.2.1, the ISFSI site is located approximately 0.22 miles northeast of the Unit 1 containment. The population data presented in this section for the ISFSI are actually based on distances from the Unit 1 containment rather than distances from the ISFSI site. The 0.22 mile offset to the ISFSI, however, is considered to have a negligible effect on the population estimates at various distances and directions from the ISFSI.

The population data are provided for areas within a 50-mile radius of the ISFSI. Population distributions are provided for areas within specific radii and sectors, and include the 2000 census data as well as projections for the years 2010 and 2025.

The area within 50 miles of the ISFSI includes most of San Luis Obispo County, some portions of Santa Barbara County, and a small area of Monterey County. Approximately 55 percent of the area within the radius is on land, with the balance being the Pacific Ocean. In general, the portion of California that lies within 50 miles of the ISFSI is relatively sparsely populated, having approximately 424,000 residents in 2000.

2.2.3.2 Regional Population

The 2000 census population of this region is very close to that projected in the original FSAR for DCPP, and subsequent projections by the Department of Finance are similarly close to earlier projections. Table 2.2-1 shows population trends of the State of California and of San Luis Obispo and Santa Barbara Counties. Table 2.2-2 shows the growth since 1960 of the principal cities within 50 miles of the site. Table 2.2-3 lists communities within 50 miles having a population of 1,000 or more, provides distance and direction from the ISFSI site, and shows the 2000 population.

2.2.3.3 Population Between 10 And 50 Miles

Figure 2.2-1 shows the 2000 population distribution between 10 and 50 miles, within the sectors of 22.5 degrees, with part circles of radii of 10, 20, 30, 40, and 50 miles.

Figures 2.2-2 and 2.2-3 show projected distributions for 2010 and 2025, respectively, and are based primarily on population projections published by the California Department of Finance and interviews with area government officials. In 2000, some 82 percent of those persons within 50 miles of the site resided in the population centers listed in Table 2.2-3.

The age distribution of the projected population (for example, 0 to 12 years, 12 to 18 years, greater than 18 years) for the years corresponding to the midpoint of the ISFSI operating life is not available. Table 2.2-4 provides the age and sex of the total population for San Luis Obispo County in 2000. The source of the information is the Population Estimates Program, Population Division, US Census Bureau, Washington, DC.

2.2.3.4 Population Within 10 Miles

The 1990 census counted approximately 22,200 residents within 10 miles of the ISFSI site. The 2000 census counted approximately 23,700 residents within the same 10 miles. The nearest residence is about 1.5 miles north-northwest of the ISFSI site and is occupied by two persons. There are 4 permanently inhabited dwellings, with approximately 14 residents, within 5 miles of the ISFSI site. The population within a 6-mile radius, the low population zone (LPZ) as used in the emergency plan, is estimated to be 100.

Figure 2.2-4 shows the 2000 population distribution within a 10-mile radius wherein the area is divided into 22.5-degree sectors and part circles with radii of 1, 2, 3, 4, 5, and 10 miles. Figures 2.2-5 and 2.2-6 show projected population distribution for 2010 and 2025, respectively, and are based primarily on population projections published by the California Department of Finance. The distributions are based on the assumption that the land usage will not change in character during the next 25 years, and that the population growth within 10 miles will be proportional to growth in San Luis Obispo County as a whole.

The nearest population center distance is approximately 10 miles, the distance to the nearest boundary of the city of San Luis Obispo. The city is situated beyond the San Luis Range and east-northeast of the ISFSI site. The 2000 census shows the city to have a population of approximately 44,000.

Several elementary schools are located within 10 miles of the ISFSI site, near Los Osos and Avila Beach. No schools are located within 5 miles of the site. The area schools serve the local community and do not draw from outlying areas. California Polytechnic State University is located 12 miles north-northwest of the ISFSI site and has an enrollment of approximately 17,000. Cuesta College is located 10 miles northeast of the site and has an enrollment of approximately 10,000.

Montana de Oro Park is located north of the ISFSI site. Its area of principal use is along the beach, between 4 and 5 miles north-northwest of the site. The total number of visitor-days during a 12-month period over the last 5 years averages 600,000.

2.2.3.5 Transient Population

In addition to the resident population presented in the tables and population distribution charts, there is a seasonal influx of vacation and weekend visitors within a 50-mile radius, especially during the summer months. The influx is heaviest to the south along the coast from Avila Beach to south of Oceano.

During August, the month of heaviest influx, the maximum overnight transient population in motels and state parks in this area is approximately 100,000 persons. However, there are no significant seasonal or diurnal shifts in population or population distribution within the LPZ.

Table 2.2-5 lists transient population for recreation areas within 50 miles of the site for the periods of record listed.

Within the LPZ, the maximum-recorded number of persons at any single time is estimated to be 5,000. This figure is provided by the State Department of Parks and Recreation and corresponds to the maximum daytime use of Montana de Oro State Park. Overnight use is considerably less, with an estimated maximum of 400. Evacuation of these numbers of persons from the park in the event of a radiation release could be accomplished as noted in Chapter 15 of the Diablo Canyon FSAR Update.

2.3 ECOLOGY

This section describes the terrestrial and aquatic ecology in the area of the Diablo Canyon ISFSI. The discussion focuses primarily on the ISFSI site and a 5-mile radius around the ISFSI site, termed the Site Vicinity, and the coastal marine environment to a distance of 100 ft from shore (Figure 2.3-1). In addition to the term Site Vicinity, another term used frequently in this section is Diablo Canyon Lands. The term Diablo Canyon Lands means the lands north and south of DCPP owned by PG&E. As described in Section 2.1 of this ER, the PG&E owned lands extend inland from the coastline 0.5 to 1.75 miles and from the southern boundary of Montana de Oro State Park to approximately 8 miles south of DCPP. PG&E supervises a program of land and natural resource management for the PG&E properties north and south of DCPP (approximately 12,500 acres).

2.3.1 TERRESTRIAL ECOLOGY

2.3.1.1 Botanical Resources

PG&E-owned lands in the Site Vicinity were surveyed for threatened and endangered species over the period of 1992 to 1997 (References 1 and 2). Surveys of the Site Vicinity were performed using aerial photographic interpretation and ground level verification. Additional botanical surveys were performed throughout the ISFSI site in 1999, using appropriate botanical survey protocols to determine if any sensitive plant species are present in or near the proposed ISFSI site. Field surveys were performed on April 30 and May 21, 1999 by consulting botanist, John C. Stebbins. Additional surveys that included botanical investigations were performed by the consulting firm, LSA Associates Inc., during the spring and summer of 2001. A PG&E staff biologist performed botanical surveys of Disposal Sites 2 and 3 on February 28, 2001. All of the potential impact areas for the pad, access routes, construction buffers, and disposal sites were surveyed on foot. All survey work was performed under the direction of PG&E.

2.3.1.1.1 Species and Relative Abundance

Table 2.3-1 presents a list of more than 400 vascular plants identified during surveys of the Site Vicinity and Diablo Canyon Lands. Figure 2.3-2 identifies the pattern, distribution and relative abundance of each vegetation community type. Only that part of the Site Vicinity owned by PG&E is shown in Figure 2.3-2.

2.3.1.1.2 Species/Habitat Inventories

As discussed in Section 2.3.1.1 above, PG&E surveyed all company-owned land holdings (approximately 12,500 acres) near the ISFSI site and mapped vegetation communities using aerial photographic interpretation and ground level verification. This information was then incorporated into a geographic information system from which vegetation maps were produced. Figure 2.3-2 identifies 12 vegetation community types occurring on PG&E-owned lands within the Site Vicinity. These community types are briefly described below.

Agriculture: Row crop agriculture is currently practiced only on the coastal terrace acreage south of Diablo Canyon Power Plant. When not managed specifically for agricultural crops, these sites are dominated by non-native and native weeds. Examples include mayweed (*Anthemis cotula*), mugwort (*Artemisia douglasiana*), Italian thistle (*Carduus pycnocephalus*), tocalote (*Centaurea melitensis*), pineapple weed (*Matricaria matricarioides*), bull thistle (*Cirsium vulgare*), cudweed (*Gnaphalium* spp.), telegraph weed (*Heterotheca grandiflora*), smooth cat's-ear (*Hypochaeris glabra*), slender tarweed (*Madia gracilis*), coast tarweed (*M. sativa*), milk thistle (*Silybum marianum*), prickly sow thistle (*Sonchus asper* ssp. *asper*), common sow thistle (*S. oleraceus*), spiny cocklebur (*Xanthium spinosum*), field mustard (*Brassica rapa*), wild radish (*Raphanus sativus*), sourclover (*Melilotus indica*), strawberry clover (*Trifolium fragiferum*), rose clover (*T. hirtum*), crimson clover (*T. incarnatum*), filaree (*Erodium* spp.), common mallow (*Malva neglecta*), bull mallow (*M. nicaeensis*), plantain (*Plantago* sp.), curly dock (*Rumex crispus*), wild oats (*Avena fatua*), ripgut grass (*Bromus diandrus*), and crabgrass (*Digitaria* spp.).

Bishop Pine: The slopes of the San Luis Range are dominated by a complex mosaic of vegetation types consisting of pine, chaparral, oak woodland, and coastal scrub. The overstory of forested areas is dominated by Bishop pine. Understory shrubs within the Bishop pine forest include tan oak (*Lithocarpus densiflorus*), coast live oak (*Quercus agrifolia*), manzanita (*Arctostaphylos spp.*), chinqapin (*Castanopsis chrysophylla*), huckleberry (*Vaccinium ovatum*), salal (*Gaultheria shallon*), silk-tassel (*Garrya* spp.), and madrone (*Arbutus menziesii*). This plant community is a California Natural Diversity Data Base (CNDDB) "high inventory priority habitat" and is considered sensitive by the California Department of Fish and Game (CDFG).

Chaparral: PG&E has mapped chaparral on the property, but Figure 2.3-2 does not differentiate the several subtypes that occur (for example, central maritime chaparral, chamise chaparral, and ceanothus chaparral). Chaparral consists of dense, almost impenetrable thickets of ceanothus, manzanita, chamise, and elements of oak woodland and coastal scrub habitats. Huckleberry, gooseberry, bush poppy (*Dendromecon rigida*), wild buckwheat (*Eriogonum* spp.), and mountain mahogany (*Cerocarpus* spp.) are also present. Chaparral characteristically intergrades with Bishop pine forest and coastal scrub.

Coastal Bluffs, Rocks, And Beaches: Most of the vegetation mapped in this community type consists of a mixture of native perennial and introduced annual grasses, beach-bur (*Ambrosia chamissonis*), golden yarrow (*Eriophyllum confertiflorum*), sand-spurrey (*Spergularia* sp.), saltbush (*Atriplex canescens*), dudleya, salal, and milkvetch (*Astragalus nuttallii*). It is here that Kephardt reported the occurrence of two California native perennial grasses, seaside brome (*Bromus maritimus*) and Pacific wildrye (*Elymus pacificus*) (Reference 3). Rocks, especially those offshore, and isolated bluff edges with guano-enriched soils, support maritime goldfields (*Lasthenia maritima*). Beaches support sea rocket (*Cakile maritima*) but contain few of the dune plants characteristic of the region around Morro Bay, just a few miles to the north.

Coastal Scrub: Diablo Canyon Lands contain scrublands dominated by black sage (*Salvia mellifera*), California sagebrush (*Artemisia californica*), bush monkeyflower (*Mimulus aurantiacus*), purple needlegrass (*Nassella pulchra*), and coyote brush (*Baccharis pilularis*).

This habitat corresponds to the Lucian central coastal sage scrub described by Holland (Reference 4). Poison oak (*Toxicodendron diversilobum*) and morning glory (*Convolvulus arvensis*) are common associates of this habitat.

Developed Areas: Areas of highly compacted soils, such as those surrounding the 230-kV and 500-kV switchyards and other developed sites, constitute a relatively small part of the Diablo Canyon Lands. Weeds have invaded some developed areas, and the vegetative composition is similar to that in the agricultural areas discussed previously.

Grassland: Annual grasslands found throughout the Diablo Canyon Lands represent, for the most part, an induced subclimax brought about through conversion of native vegetation types to accommodate agricultural practices and wildland fuel management objectives. Grazing and periodic fires have influenced the distribution of these grasslands since the early Spanish colonial period. The annual grasslands predominantly consist of introduced species such as wild oats (*Avena* spp.), brome (*Bromus* spp.), wild barley (*Hordeum* spp.), ryegrass (*Lolium* spp.), mustard (*Brassica* spp.), filaree (*Erodium* spp.), and bur clover (*Meticago hespida*).

Native perennial grasslands on Diablo Canyon Lands are characterized by their rich plant diversity, composition, and complexity. The dominant type of perennial grassland found on Diablo Canyon Lands is the coastal terrace prairie (Reference 4). Located predominantly on cool, north-facing, windswept hills and coastal marine terraces, these grasslands are similar to the northern coastal prairie in species composition and plant associations. This grassland is characterized by the absence of two northern grassland species, creeping red fescue (*Festuca rubra*) and Idaho fescue (*F. idahoensis*). Genetic and paleobotanical evidence suggests that coastal prairie species are mostly northern in their origin and ultimately palearctic in their affinities (Reference 5).

Historical disturbances such as fire and grazing play important roles in the occurrence, distribution, and composition of remnant perennial grasslands. The most important factor influencing the range and distribution of pristine coastal grasslands is the soil type. Deep, well-developed, slightly acidic soils without a rock substrate are candidate sites for relict grasslands. The exceptions are scattered colonies of small-flowered melic (*Melica imperfecta*), Sandberg bluegrass (*Poa secunda*), and foothill needlegrass (*Nassela lepida*), which tend to occupy thin, rocky soil sites where there is a conspicuous lack of annuals.

Marsh: Freshwater marsh occurs near Windy Point, north of the power plant site and in Irish Canyon to the south. Near Windy Point, a naturally occurring artesian spring was excavated to create a small pond. This pond was later colonized by freshwater emergent plant species such as baltic rush (*Juncus balticus*), cattail (*Typha latifolia*), spike rush (*Eleocharis* sp.), and water milfoil (*Myriophyllum* sp.). A man-made pond constructed for livestock use in Irish

Canyon also contains these species. Other areas of marsh habitat include the mouth of Coon Creek, where small-fruited sedge occupies microsites not scoured by high runoff from the creek. Similar vegetation may also be found in association with various seeps, springs, and ponds used for irrigation.

Oak Woodland: Woodlands or shrublands dominated by coast live oak are principal habitat types on Diablo Canyon Lands. The understory of these woodlands contains important wildlife food plants such as scarlet catchfly (*Silene californica*), salal, huckleberry, vetch (*Vicia* spp.), gooseberry, pitcher sage, coffeeberry (*Rhamnus californica* ssp. *californica*), and spiny redberry (*R. crocea*). Oak woodland forms a complex mosaic with Bishop pine woodland, chaparral, and coastal scrub. The resulting ecotones constitute important components of wildlife habitat.

Riparian: The deep canyons formed by Coon, Diablo, Irish, and Ruda creeks support dense stands of mixed hardwood trees. In most of these areas, the coast live oak woodland is juxtaposed with riparian areas. The riparian habitats on the property are of the central coast riparian scrub and central coast live oak riparian forest types (Reference 4). The dominant tree and shrub species in these canyon bottoms are coast live oak, big-leaf maple (*Acer macrophyllum*), elderberry (*sambucus mexicana*), dogwood (*Cornus sericea* ssp. *occidentalis*), gooseberry (*R. menziesii*), California bay (*Umbellularia californica*), wax myrtle (*Myrica californica*), coffeeberry, thimbleberry (*Rubus vitifolius*), arroyo willow (*Salix lasiolepis*), and shining willow (*S. lucida* ssp. *lasiandra*).

Eucalyptus: Small groves of eucalyptus occur at two sites only, south of the power plant. Indigenous to eastern Australia, this tree sheds bark, fruits, and leaves on the ground, and oils and tannins in this litter prevent the establishment of most competing vegetation. As a consequence, these groves are often characterized by sparse understory vegetation.

Grassland With Sparse Coastal Scrub: Heavy stands of coastal scrub typically return to a lower density scrub/grass association following management treatments to reduce wildland fuel volume or to improve range condition. Species composition may not be appreciably different from that in coastal scrub or grasslands.

2.3.1.1.3 Botanical Survey Results - ISFSI Site

Botanical surveys were performed to determine if any sensitive plant species are present in or near to the proposed ISFSI site. All of the potential impact areas for the proposed storage facility, access routes, construction buffers and Disposal Site 1 (Figure 2.1-2) were methodically surveyed on foot during the appropriate flowering periods. Additional field surveys were performed at proposed Disposal Sites 2 and 3 in February 2001. The results of these surveys are presented below:

Habitat Descriptions: Vegetation habitats present in the described project area (storage site and access routes) include adventive annual grassland species and scattered coastal scrub plants that have recolonized the previously disturbed site. The entire area consists of a slope cut that was "created" during the original construction period. The dominant plant species present include milk thistle *(Silybum marianum)*, italian thistle *(Carduus pycnocephalus)*, wild oats *(Avena fatua)*, ripgut brome *(Bromus diandrus)*, english plantain *(Plantago lanceolata)*, bur clover *(Medicago hispida)*, annual ryegrass *(Lollium multiflorum)*, California sage *(Artemisia californica)*, bush monkey flower *(Mimulus aurantiacus)*, coyote bush *(Baccharis pilularis)*, coffeeberry *(Rhamnus californica)*, and pampas grass *(Cortaderia selloana)*.

Disposal Site 1 is located on the lower slopes and flat near to the existing equipment and discard storage area. This partially paved area is a highly modified and disturbed site that is dominated by mostly ruderal (weedy) plant species in those sites that support vegetation. Horehound *(Marrubium vulgare)*, tansy mustard *(Sisymbrium altissimum)*, poison hemlock *(Conium maculatum)*, telegraph weed *(Heterotheca grandiflora)*, and fennel *(Foeniculum vulgare)* are the dominant vascular plant species present. A 6-ft-wide by 60-ft-long "drainage ditch" is present at the bottom of the site that carries runoff water to a drain which eventually flows to Diablo Creek. Over a long period of time several hydrophytic or wetland plant species have become established in this ditch. These include cattail *(Typha latifolia)*, rabbit foot grass *(Polypogon monspeliensis)*, and brass buttons *(Cotula coronopifolia)*.

The described ditch is unlikely to qualify as a wetland (sensu, federal Clean Water Act) because of its small size and because the concrete lining has not allowed for the development of hydric soils. Further clarification of the potential for jurisdictional permitting by the US Army Corps of Engineers (COE) will be pursued during the local permitting phase of the project.

Disposal Site 2, located at Parking Lot 1 (Figure 2.1-2), is a nonvegetated area with a compacted gravel surface used for overflow parking. No botanical resources of consequence occur at this location.

The slopes surrounding Disposal Site 3, located at Parking Lot 7 (Figure 2.1-2), are vegetated with common coastal scrub vegetation that reestablished after excavation and grading for construction of the power plant. Typical species include coyote bush, gum weed (*Grindellia camporum*), California sage, and several species of annual grasses and forbs. The balance of this site consists of asphalt-paved surfaces used for parking.

The research and investigation stage of this study resulted in development of a list of sensitive plant species that could potentially occur in the immediate vicinity of the ISFSI. These species are identified in Table 2.3-2.

Surveys conducted throughout the proposed ISFSI Site Vicinity resulted in the discovery of no Federal or State listed or sensitive plant species or other unique botanical resources in or near areas likely to be impacted by the proposed project.

Several of the more important plant taxa known to occur in the Site Vicinity, but which were not found on or immediately adjacent to the ISFSI site include the following:

PECHO MANZANITA
(Arctostaphylos pechoensis)
(List 1B, California Native Plant Society. Found in Central Maritime Chaparral habitat on Diablo Canyon Lands, along the higher ridges of the Irish Hills east of the ISFSI.) (Reference 6)

LA CRUZ MANZANITA
(Arctostaphylos cruzensis)
(List 1B, California Native Plant Society. This plant occurs in highly localized population near the southern boundary of Diablo Canyon Lands at San Luis Hill, overlooking Avila Harbour.) (References 6, 7, 8)

INDIAN KNOB MOUNTAINBALM
(Eriodictyon altissimum)
(State endangered; federally endangered. Not known on Diablo Canyon Lands)
(References 9, 10, 11, 12)

2.3.1.2 Wildlife Resources

2.3.1.2.1 Species and Relative Abundance

Table 2.3-3 was developed using the California Wildlife Habitat Relationships Program (CWHR), a computerized database of California's wildlife and habitats (Reference 13). Input variables used for the computer analysis included habitat type and county of occurrence. In order to obtain the broadest possible listing of species for the ISFSI and Site Vicinity, an input format was used that selected all successional stages of each habitat type and all special habitat elements. This approach minimizes errors of omission while allowing for some errors of commission. For more on how CWHR predicts wildlife occurrence, see Reference 14. The computer-generated table identifies those wildlife species with some potential to occur near the ISFSI site. Also shown is the relative value provided by each habitat for certain essential life requisites (that is, feeding, cover, and breeding). Rationally, those species receiving high life requisite values from habitats found in the Site Vicinity would be expected to actually occur more often than those receiving low to moderate values. In this sense, the tables also serve to suggest possible relative abundance relationships among the many species listed. It should be noted that few of the CWHR species/habitat models have been field validated, and were developed from information published in scientific literature.

2.3.1.2.2 Species/Habitat Inventories

Twelve distinct wildlife habitats have been described (Reference 15) as occurring in the Site Vicinity of the proposed ISFSI, and are briefly described below. For a description of the floristic composition of these habitats, see the discussion presented in Section 2.3.1.1. The

ISFSI site consists of disturbed ruderal vegetation communities resulting from the earlier construction of the 230-kV and 500-kV switchyards. Some wildlife habitat value remains associated with the ISFSI site and consists of annual grassland with sparse coastal scrub. The adjacent disposal area (Disposal Site 1) is almost entirely nonvegetated and currently serves as a material storage yard. This area, which has very little value to wildlife, lies atop fill used for the construction of the switching complex. The two additional disposal areas (Disposal Sites 2 and 3) are currently used as employee and contractor parking lots. Disposal Site 2 is nonvegetated and gravel-surfaced with no significant wildlife habitat value. Disposal Site 3 is asphalt-paved over a significant percentage of its total area. The remaining unpaved area (about 2.5 acres) supports a post-disturbance succession of coastal scrub with wildlife habitat values similar to those described above for the ISFSI site.

Agriculture: Agricultural pest control activities, such as fencing, trapping, and poisoning, reduce wildlife diversity and abundance. A few species of rodents and birds such as the deer mouse, Brewers blackbird, red-winged blackbird and California horned lark are locally benefited by agricultural land uses on the Diablo Canyon Lands.

Bishop Pine: Bishop pine communities support relatively few regionally rare or declining wildlife species; although an intergrade between the southern and Pacific rubber boas may be present. The black-bellied salamander, western fence lizard, and ring-necked snake are among the other reptiles and amphibians that may also occur. Several species of birds may nest in the Bishop pine forest, including the band-tailed pigeon, Coopers and red-tailed hawks, and the common flicker. The gray squirrel, several species of mice, and large mammals such as deer, coyote, and gray fox also use this habitat.

Chaparral: Amphibian diversity usually is low in chaparral. The black-bellied salamander, ensatina, and Pacific tree frog are the most likely residents. Reptiles tend to be more diverse, and this habitat supports the western fence lizard, side-blotched lizard, striped racer, and western rattlesnake. Birds characteristic of chaparral include the California quail, greater roadrunner, Bewick's wren, scrub jay, California thrasher, and white-crowned sparrow (winter only). Bell's sage sparrow, a regionally rare species, prefers chaparral habitats dominated by chamise. Many species of rodents occur in this habitat, and brush rabbit and black-tailed jackrabbit occur in more open areas. Carnivores such as the coyote, gray fox, striped skunk, and bobcat frequent chaparral because of the high diversity and abundance of prey.

Coastal Bluffs, Rocks, And Beaches: Rocky cliffs, offshore rocks, and rocky intertidal areas provide roosting and nesting habitat for pelicans, cormorants, gulls, terns and peregrine falcons, as well as foraging habitat for shorebirds such as black oystercatchers, black and ruddy turnstones, willets, and surfbirds. Few species of wildlife other than birds are known to frequent coastal beach habitat. The western fence lizard and silvery legless lizard are the most frequent species of reptile. Deer mice, California ground squirrels, raccoons, and coyotes are also known to frequent this habitat.

Coastal Scrub: The composition of wildlife in coastal scrub is similar to that of chaparral. Reptiles and small birds and mammals are usually abundant. The San Diego desert woodrat is common in rocky outcrops in coastal scrub. Carnivorous mammals such as coyotes, raccoons, long-tailed weasels and bobcats hunt for abundant prey. Likewise, foraging is good for birds of prey such as the white-tailed kite, northern harrier, merlin, and burrowing and short-eared owls.

Developed And Ruderal Areas: Areas of highly compacted soils or otherwise developed sites constitute a relatively small percentage of the Diablo Canyon Lands, however, this is the primary community type throughout the proposed ISFSI area. Fewer wildlife species frequent developed areas because of lack of suitable food and cover, and higher levels of human disturbance. Towers, buildings, and other structures may provide artificial roosting or nesting habitat for some species of rodents, bats, and birds.

Grassland: The Pacific tree frog, black-bellied salamander, western skink, southern alligator lizard, common kingsnake, and gopher snake are among the amphibians and reptiles in this habitat. At various times of year, grasslands support a variety of birds, including the California horned lark, western meadowlark, savannah sparrow, and raptors such as the golden eagle and American kestrel. Grasslands are the favored habitat for the California ground squirrel, Bottas pocket gopher, and western harvest mouse. Predators such as burrowing owls, coyotes, long-tailed weasels, and badgers depend on grasslands for foraging and denning sites.

Marsh: Marshes provide important breeding habitat for several species of amphibians and reptiles including the Coast Range newt, southwestern pond turtle, and western aquatic garter snake. Waterfowl and other birds such as the tricolored blackbird may roost, feed, or breed at these sites. Rodents are common, and predators such as the white-tailed kite, northern harrier, coyote, badger, and long-tailed weasel may frequent this habitat.

Oak Woodland: The moist understory of oak woodlands provides suitable habitat for several species of amphibians and reptiles, including the black-bellied salamander, ensatina, Coast Range newt, western fence lizard, western skink, silvery legless lizard, and ringneck snake. Oak woodlands provide important nesting and foraging habitat for birds, including acorn and downy woodpeckers, western flycatcher, Huttons vireo, and orange-crowned warbler. Raptors that may roost, forage, or breed in oak woodlands include Coopers and sharp-shinned hawks and the great horned, pygmy, and possibly California spotted owls. The protective cover and forage in oak woodlands attract many small mammals such as the broad-footed mole, California mouse, dusky-footed woodrat, and Townsends big-eared and pallid bats. Many carnivores such as the mountain lion, bobcat, coyote, and ringtail forage in oak woodlands; acorns provide seasonal food for many wildlife species such as mule deer, grey squirrels, and band-tailed pigeons.

Riparian: Undisturbed riparian habitats generally support the greatest diversity and abundance of wildlife. This is partly due to the complexity of microhabitats (leaf litter, fresh water, dense understory, and a multi-layered canopy for nesting and foraging). The abundance and

diversity of amphibians, reptiles, birds, and mammals can be quite high. Several regionally rare species forage, roost, and breed in these habitats. These include the California red-legged frog, southwestern pond turtle, Coopers hawk, California spotted owl, Townsends big-eared and pallid bats, and ringtail.

Eucalyptus: Birds are the only vertebrate wildlife expected to frequent small stands of eucalyptus. Common raptors such as the red-tailed hawk, American kestrel, barn owl, and great horned owl use these trees for roosting and nesting. Other common species include the rock dove, common flicker, European starling, and yellow-rumped warbler (winter only). Eucalyptus groves provide roosting habitat for the monarch butterfly, a species identified as sensitive by the CDFG.

Grassland With Sparse Coastal Scrub: Many of the same wildlife species occur in this habitat as in grasslands. Brush rabbit and black-tailed jackrabbit favor this habitat because it provides open areas for foraging and cover to escape predation. Grasshopper and rufous-crowned sparrows also favor this habitat type.

2.3.1.2.3 Listed and Proposed Threatened and Endangered Species and Other Species of Importance

PG&E-owned lands in the Site Vicinity were inventoried for the presence of threatened, endangered, and sensitive species over the period of 1992 to 1997. This work was performed under the direction of PG&E and the results were presented in two documents covering different parts of the total ownership (References 1 and 2). Table 2.3-4 identifies those species known to occur or potentially occurring within the Site Vicinity.

A protocol level survey for California red-legged frogs was conducted in August 1999, within and adjacent to Diablo Creek from near the mouth to a point approximately one-half mile upstream from the 500-kV switchyard. No California red-legged frogs were found during the survey. The California red-legged frog (*Rana aurora draytonii*) is listed as threatened under the federal Endangered Species Act.

No proposed or listed threatened or endangered terrestrial wildlife species have been identified occurring within the ISFSI site. Within the Site Vicinity, species currently listed or proposed for listing by the state of California or the federal government as either threatened or endangered include the brown pelican (state and federally endangered) and the peregrine falcon (state endangered; federally delisted), southern sea otter (federally threatened) and the green sea turtle (federally threatened). The sea otter and the green sea turtle are discussed further in Section 2.3.2.1.

Several of the more important terrestrial species known to occur in the Site Vicinity, but not found on or immediately adjacent to the ISFSI are presented below:

PEREGRINE FALCON
(Falco peregrinus anatum)

Regional and Local Distribution. The peregrine falcon occupies breeding territories at select sites along the California coast north of Santa Barbara, in the Sierra Nevada Mountains, and in other mountains of northern California. In winter, this species is found throughout the Central Valley, and occasionally on the Channel Islands. Migrants occur along the coast and in the coastal habitats. Riparian areas and coastal and inland wetlands are important habitats yearlong. One active peregrine falcon nesting territory occurs within the Site Vicinity, located on an off-shore rock, and a second territory occurs to the north in the vicinity of Morro Bay (Polite, et al: in Reference 16).

Conservation Status. The peregrine falcon is currently listed as endangered under the California Endangered Species Act. On August 26, 1998, this species was proposed for delisting under the federal Endangered Species Act.

Status on Diablo Canyon Lands. The peregrine falcon is a year-round resident in the vicinity of Diablo Canyon. One active nesting territory occurs within the Site Vicinity, located on an off-shore rock.

Habitat Suitability. Suitable nesting habitat occurs in the form of isolated off-shore rocks and cliffs. Foraging habitat includes the air space above coastal terraces, coastal bluffs, and near shore areas, where prey birds (up to the size of ducks) are hunted on the wing.

Mapping Criteria. Peregrine falcon habitat has not been mapped on the Diablo Canyon Lands.

Local Endangerment Factors. Continuing exposure to toxic pesticides, primarily from migrant prey species, is the most important endangerment factor. Peregrine falcon populations have rebounded significantly since restrictions were placed on use of DDT in the US.

BROWN PELICAN
(Pelicanus occidentalis californicus)

Regional and Local Distribution. The brown pelican is found in estuarine, marine subtidal, and marine pelagic waters along the entire California coastline. Brown pelicans breed on the Channel Islands (Anacapa, Santa Barbara, and Santa Cruz) from March to early August. In southern California, the brown pelican is common along the coast from June to October, especially within 20 miles of shore, but can be found as far as 100 miles out to sea (Polite, et al: in Reference 16).

Conservation Status. The brown pelican is currently listed as endangered under both the state and federal Endangered Species Acts.

Status on Diablo Canyon Lands. Brown pelicans are frequently observed, outside the breeding season, along the Pecho Coast where they feed in open water areas off-shore and rest on off-shore rocks along the outer edges of the coastal bluffs.

Habitat Suitability. Off-shore rocks and coastal bluffs overlooking the water are used for roosting. No nesting by this species occurs along the Pecho Coast. Foraging is limited to off-shore open water areas.

Mapping Criteria. Brown pelican habitat has not been mapped on the Diablo Canyon Lands.

Local Endangerment Factors. No local endangerment factors have been identified for this species.

MORRO BAY SHOULDERBAND SNAIL
(*Helminthoglypta walkeriana*)
(Federally endangered; not known on Diablo Canyon Lands.)

CALIFORNIA RED-LEGGED FROG
(*Rana aurora draytonii*)
(Federally threatened; not known to occur on Diablo Canyon Lands; critical habitat for this species was designated within San Luis Obispo County by the US Fish and Wildlife Service on March 6, 2001; none of the specific watershed areas identified within critical habitat units located in the County occur within the Site Vicinity)
(References 17, 18, 19, 20)

GOLDEN EAGLE
(*Aquila chrysaetos*)
(Known to forage over Diablo Canyon Lands; nesting status unknown)
(References 16, 21, 22, 23)

2.3.1.2.4 Keystone Species

The *Dictionary of Ecology, Evolution and Systematics* (Reference 24) defines keystone species as, "(one) capable of having a major influence on community structure, often in excess of that expected from its relative abundance." Community structure includes both the relative abundance of animal populations and the composition and structure of the various habitats those populations utilize. In the vicinity of the proposed ISFSI, top trophic level carnivores, particularly birds of prey such as the golden eagle, red-tailed hawk, coopers hawk, and peregrine falcon, occur in relatively small numbers compared to their abundant prey (small mammals and birds). As predator populations decline, populations of certain prey species may increase. If overall conditions favor a large and sustained increase, secondary impacts on native vegetation and soils can result.

The mountain lion is another keystone species closely associated with and affecting change in the local mule deer population. When habitat value for deer declines, (as following many

years of fire prevention and suppression) predators like the mountain lion are capable of driving deer numbers downward.

The ISFSI project is not expected to have any significant direct or indirect effect on terrestrial keystone species within the Site Vicinity or region. This conclusion is based upon the relatively small acreage involved in the construction of the facility, limited removal or disturbance of native vegetation, and its location within and adjacent to areas of significant prior disturbance where the present value of wildlife habitats is relatively low.

2.3.1.2.5 Commercially and Recreationally Important Species

Since no terrestrial wildlife species may be commercially harvested in California, species of commercial importance in the ISFSI vicinity are limited to those that may be classified as pests. The Diablo Canyon Land Stewardship and Best Management Practices (a program established by PG&E in 1991) stipulates that predator and pest management activities will be carried out by professional control specialists, and control measures will be sanctioned only if significant risk of loss or degradation of other resources would result without these measures.

Several recreationally important species occur on the Diablo Canyon Lands. These include California quail, mule deer, mourning doves, brush rabbits and several species of migratory waterfowl. Although these species are recreationally harvested elsewhere in the general region surrounding the ISFSI under regulations annually issued by the California Department of Fish and Game, no hunting is allowed anywhere on the Diablo Canyon Lands. However, PG&E provides a program of docent-led day hikes that feature observation of native wildlife and flora. These hikes are available at no cost to the public and go along the Pecho Coast Trail leaving from Point San Luis Lighthouse.

2.3.1.2.6 Preexisting Environmental Stresses and Status of Ecological Succession

Preexisting environmental stresses within the ISFSI area stem largely from prior activities associated with construction of the 230-kV and 500-kV switchyards. These activities included removal of native vegetation, cut-and-fill impacts to the natural soil profile, enclosing approximately 2,600 ft of Diablo Creek in a culvert located below the switchyard fill area, soil compaction, surface paving, and control, treatment and discharge of surface water runoff. Additional stresses include grazing by domestic livestock, vegetation management along ISFSI roads, buildings and other structures, and road maintenance. Ecological succession in the immediate ISFSI area has been arrested and held either on previously disturbed lands (proposed disposal areas), or an early successional stage of coastal scrub characterized by several species of non-native annual grasses and sparse stands of coyote bush and California sage (proposed storage site).

Preexisting environmental stresses within the Site Vicinity include livestock grazing, irrigated agriculture, diversion of water from Diablo Creek, spring development, ground water pumping, wildland fuels management, and road maintenance. Except in areas of irrigated agriculture and other developed sites, the status of ecological succession in the ISFSI vicinity

is most strongly influenced by livestock grazing, fire suppression, wildland fuels management, and road maintenance. The majority of the area within the Site Vicinity consists of a mosaic of natural vegetation community types as described in Section 2.3.1.1. With the exception of a wildland fuels management area located east of the ISFSI area within the Diablo Creek watershed, remaining chaparral and coastal scrub communities are presently in a mature to over mature stage characterized by maximum height and density of vegetation and a high percentage of standing dead material. Approximately 400 acres of the Diablo Creek watershed, is actively managed using integrated vegetation management techniques to reduce fuel volume and risk of damage to utility structures from fire.

Throughout the Diablo Canyon Lands, the Bishop pine and oak woodland communities are also characterized by dense stands of older age class trees. Grassland areas are more extensive than would be expected without the influence of domestic herbivores. Without livestock grazing more of the coastal terrace acreage would return to coastal scrub vegetation. Progressive practices of controlled grazing have encouraged the return of several species of native perennial grasses north of the power plant while preventing the return of coastal scrub vegetation. Areas presently grazed by cattle and goats are best characterized as a stable grazing subclimax or steady state. These areas consist predominantly of introduced annual grasses with lesser amounts of native perennial grass species, native shrubs and native as well as non-native broad-leafed herbs.

2.3.1.2.7 Importance of Study Area as a Regional Resource

The Diablo Canyon Lands include approximately 12 miles of central California coastline, extending inland an average of about 1-1/2 miles. These lands include some of the most secluded and undisturbed natural areas in this region of the state. A diverse upland landscape and adjacent marine habitats support a wide variety of native plant and animal species. These lands are protected by restrictions on access and a program of land and resource stewardship developed and administered by PG&E. High quality natural areas, like the Diablo Canyon Lands, contribute to biodiversity conservation through preservation of regionally unique biological resources, and by preserving corridors for species movement ("connectivity") between adjacent habitat areas (for example, Montana de Oro State Park).

2.3.1.2.8 Historic Effects on Local Populations (Infestations, Epidemics, and Catastrophes)

Within the ISFSI Site Vicinity and surrounding region, the greatest single historic effect on naturally occurring terrestrial species populations may have occurred as a result of the Spanish colonization of California that began around 1542, when Juan Rodriguez Cabrillo explored the coastline of California claiming the lands for the King of Spain. Subsequent Spanish expeditions brought livestock and livestock feeds from Mediterranean Europe, and as a result established a host of exotic annual grass species that proved well adapted to survive in California's soils and climate. Over time, these non-native plants came to dominate most naturally occurring grassland areas throughout the California Central Valley region, interior coast valleys, and coastal prairies transforming what had been a largely perennial bunch grass community. Livestock grazing on the Pecho Coast can be traced at least as far back as 1845

with the establishment of a large 32,000-acre Mexican land grant awarded to Captain John Wilson and his wife, Ramona Carrillo de Wilson.

Within the Site Vicinity, construction of DCPP and associated facilities caused localized extirpation of native and introduced naturalized plant communities, and the displacement of native wildlife over approximately 120 acres of coastal terrace and adjoining upland habitats.

2.3.2 AQUATIC ECOLOGY

The aquatic ecology information presented in this section provides the baseline information needed to assess the potential effects of runoff from precipitation at the ISFSI site. Such runoff would drain primarily through Diablo Creek and discharge to Diablo Cove.

2.3.2.1 Marine Ecology

Information presented in the Marine Ecology sections was gathered from many reports generated from an intensive monitoring program of the marine environment, centered around Diablo Cove, which began in 1976. The program name most commonly used to refer to these collective studies is the Thermal Effects Monitoring Program (TEMP). The TEMP studies consist of periodic monitoring of intertidal and subtidal algae, invertebrates and fish as well as several physical parameters. Changes in the scope-of-work resulted in various program name changes. Synonymous names for the TEMP are 316(a) demonstration, Marine Environmental Monitoring Program (MEMP), Ecological Monitoring Program (EMP), and Receiving Water Monitoring Program (RWMP).

Diablo Cove occupies the mid portion of a rocky headland approximately 20 km in lateral extent which tends approximately northwest to southeast and which is bounded to the north and south by extensive sand beaches. Point Buchon is the prominent feature of this shoreline which consists of wave exposed headlands alternating with semi-protected coves. Stable bedrock and variously sized boulders are the predominant substratum. Sand, as fine gravel and shell-debris, is uncommon in the intertidal areas, where it tends to be ephemeral, but becomes common with increasing distance and depth offshore. The nearshore intertidal and subtidal ecology of algae, invertebrates, and fishes in the area lying generally between Pt. Buchon to the north and Pt. San Luis to the south have been well studied (References 25, 26, 27, 28, and 29) and are similar to other areas of central California.

The nearshore marine environment is naturally divided into intertidal and subtidal zones. Maximum tidal range is approximately 3.1 m (10 ft) and extends from 2.1 m (7 ft) above mean lower low water (MLLW) to about 0.8 m (2.5 ft) below MLLW. Below this lower tidal limit is the subtidal zone with a maximum depth of 14 m (45 ft) below MLLW within 31 m (100 ft) of shore within the study area. Based on physical characteristics, seven major habitats are represented:

INTERTIDAL

Rocky (semi-protected)	Bedrock and semi-stable boulder substrate that is relatively protected from the direct force of ocean swells. Generally of low aspect (slope) where organisms can occur both above and beneath moveable substrate
Rocky (wave exposed)	Stable rocky headland with occasional very large boulders that is exposed to the direct force of ocean swell. Generally high aspect area where algae and invertebrates colonize higher elevations due to constant wave splash.
Tidepool	Entrapped pools of water that form in bedrock depressions during low tide. Can support species that are mainly found in upper subtidal zones. Uncommon within the study area.
Sand/Cobble	Beach habitat formed by sand/shell debris or small cobble. Highly unstable during periods of high swell, often covering and uncovering bedrock substrate. Uncommon.

SUBTIDAL

Bedrock/Boulder	Stable bedrock or boulder substrate ranging from shallow wave-exposed depths (0 to 7 m) to deeper, less wave-affected depths below 7 m. Bathymetric relief ranges from low boulder/flat bedrock to high relief pinnacle.
Sand/Shell debris	Sand/shell debris in small patches between rocks or forming extensive deposits. Can be highly unstable during periods of high swell, often covering and uncovering bedrock substrate.
Open water	Midwater zone from benthic substrate to sea surface.

The diverse assemblage of algae, invertebrates, and fish within the study area are recognized as typical of the biogeographic transition zone, extending from Monterey Bay to San Diego Bay, between the cool temperate organisms typical of the northern Oregonian Province and the warm-temperate organisms typical of the southern Californian Province (References 30, 31, 32, and 33). Within the study area, high biological diversity and high natural variation in the abundance and distributions of the plants and animals within the different nearshore zones results from variations in physical factors (for example, temperature, elevation, wave exposure, impact of severe winter storm waves and surge, open space, and substrate type) and biological factors (for example, grazing, predation, space competition and recruitment episodes) (References 32, 34, 35, 36, and 37).

2.3.2.1.1 Species and Relative Abundance

Table 2.3-5 presents a list of over 900 taxa, the majority to species level; of algae, invertebrates and fish recorded from the nearshore intertidal and shallow subtidal zone of the Diablo Canyon study area. This list is not a complete listing of all marine plant and animal species which may occur in the area; it includes only those taxa that were observed and recorded in conjunction with the TEMP. Although environmental monitoring was centered on Diablo Cove and became less intensive with increasing distance away from the Cove, this species list is representative of the flora and fauna of the nearshore marine environment for the entire rocky headland between Hazard Canyon to the north and Pt. San Luis to the south.

2.3.2.1.2 Species/Habitat Inventories

Algal Resources: The outer rocky coast of central California is one of the world's most diverse regions for algae (Reference 38). Owing to their large size and dense concentrations, these algal species also serve as important habitat for a variety of aquatic animals. Kelp canopies, in particular, provide important habitat for fishes, particularly juveniles, which closely associate with the kelp for protection. The Diablo Canyon study area shares many species and habitat features with other central California areas described by Reference 38. Sparling (Reference 39) developed a list of over 400 taxa of marine algae in San Luis Obispo County, including the study area. No algal taxa in the ISFSI project area are unique to this area (endemic) and none are federally or state listed as rare or endangered.

Intertidal Resources: One hundred nineteen (119) algal taxa were identified in the intertidal zone during TEMP studies of the nearshore marine environment between 1976 and 1997 (Reference 5). Algal diversity and abundance generally increase from the high intertidal to the low intertidal zones. Most intertidal algae are restricted to specific elevations, occurring in bands along the shoreline. A species upper vertical distribution is largely determined by its ability to withstand desiccation, but shading, competition for space, and grazing are important factors as well. The high intertidal zone is only occasionally wetted by wave splash and is sparsely covered by taxa such as blue-green algae (for example, *Bangia* spp., and *Enteromorpha* spp.). The barren appearance of the splash zone disappears lower in the intertidal zone (plus 1.3 m MLLW) as algal cover becomes more conspicuous with scattered clumps of *Fucus* and *Pelvetia* (rockweeds) and *Endocladia* (red algae). A dominant alga in the mid to low intertidal zone is iridescent seaweed (*Mazaella flaccida)*. Other abundant algae include hollow branch seaweed (*Gastroclonium coulteri*), grapestone seaweed (*Mastocarpus papilatus*). and Christmas tree algae (*Gigartina canaliculata*). Surfgrass (*Phyllospadix* spp.), an angiosperm, is the predominant plant in the transition zone between the low intertidal and the shallow-subtidal areas. Surfgrass is listed by the California Department of Fish and Game as a species of special concern.

Subtidal Resources: The subtidal algal assemblage is characterized by scattered dense kelp forests. *Nereocystis luetkeana* (bull kelp) is a common surface canopy-forming kelp along the coast in this area. *Macrocystis pyrifera* (giant kelp) occurs with *N. luetkeana* in semi-exposed areas, but tends to be more abundant in calmer water. A third surface canopy-forming

species, *Cystoseira osmundacea*, also occurs with these two kelps, generally in areas shallower than about 10 m depths. The canopies of all three kelp species develop in the spring and become most luxuriant during summer through fall. *Pterygophora californica* and *Laminaria setchellii* are one-meter tall kelp plants that provide subcanopy structure throughout the year.

Below the kelp canopies are the lower growing foliose, branched, filamentous and crustose understory species consisting mainly of red and brown algae. Among the red algae, the more common and abundant taxa are the *Calliarthron/Bossiella/Serraticardia* complex, *Botryoglossum* spp., *Pikea* spp., *Farlowia* spp., *Callophyllis* spp., *Gigartina* spp., and *Rhodymenia* spp. The more common brown algae include *Dictyoneurum californicum* and *Desmarestia tobacoides*.

Invertebrate Resources: Similar to the algal resources, and for similar reasons, the invertebrate communities that inhabit the intertidal shoreline and shallow subtidal along the central coast of California are among the most diverse in the world (References 31, 32, and 40). TEMP program monitoring has identified over 400 invertebrate taxa, most to species, from the nearshore marine environment of the Diablo Canyon study area. This coast is part of a faunal transition zone with affinities to areas both north and south of Point Conception. None of the marine invertebrate taxa in the ISFSI project area are endemic, and none are federally or state listed as rare or endangered. However, abalone, including the locally common and formerly abundant red and black abalone, have been state protected from commercial and recreational harvesting in this area and elsewhere since 1997.

Intertidal Resources: TEMP studies from 1976 through 1995 and other marine biological sampling work have identified more than 300 invertebrate taxa from the intertidal zone of the Diablo Canyon study area.

Similar to the algae, the diversity of invertebrate species tends to increase from high to low elevations. In the splash zone, *Littorina* spp. (periwinkle snail) is found in rock crevices while *Tegula funebralis* (turban snail) and *Pachygrapsus* spp. (shore crab) occur in the shade of boulders. Occasionally a high intertidal tidepool will contain species more commonly found in lower elevation habitats. The barren appearance of the splash zone disappears lower in the intertidal as algal cover becomes more conspicuous. This truly intertidal area (the highest regularly submerged) is inhabited by numerous species of limpets of the genus *Lottia* and *Tectura*, *Chthamalus* spp. (the small acorn barnacle), patches of the aggregating sea anemone, *Anthopleura elegantissima*, and occasional large patches of the California mussel, *Mytilus californianus*. At lower intertidal levels, beneath the foliose blades of the algae, abundant taxa include *Pagurus* spp. (hermit crab), *Haliotis cracherodii* (black abalone), brown and black turban snails (*Tegula* spp.), motile and tube-forming worms including the sand tube worm, *Phragmatopoma californica* and *Pista elongata*, and encrusting forms of bryozoans, sponges, and tunicates. Common invertebrate predators in the intertidal zone include several species of sea stars such as the sunflower star, *Pycnopodia helianthoides* and the ochre seastar, *Pisaster ochraceus*, gastropod molluscs of the genus *Ocenebra* and *Fusinus*, rock crabs (*Cancer* spp.) and octopus (*Octopus* spp). Other intertidal invertebrate herbivores include red and purple sea urchins (*Strongylocentrotus* spp.) and kelp crabs (*Pugettia* spp.).

Subtidal Resources: Over 230 invertebrate taxa have been identified occupying the subtidal zone within 100 ft of shore in the vicinity of the ISFSI (References 4, 28, and 41). The distribution and abundance of these organisms are controlled by various biotic and abiotic factors which cause their populations to fluctuate over time. Gotshall et al. (Reference 27) and PG&E (Reference 4) showed that numerically important invertebrate herbivores include red urchins (*Strongylocentrotus franciscanus*), purple urchins (*S. purpuratus*), brown turban snails (*Tegula brunnea)*, Monterey turban snails (*T. montereyi*), top snails (*Lithopoma gibberosum*), red abalone (*Haliotis rufescens*), giant gumboot chitons (*Cryptochiton stelleri*); and many smaller species such as dunce cap limpets (*Acmaea mitra*), lined chiton (*Tonicella lineata*), and dwarf turban snails (*Homalopoma luridum*). Invertebrate predators include sunflower seastars (*Pycnopodia helianthoides*), giant spined seastars (*Pisaster giganteus*), short spined seastars (*P. brevispinus*), ochre seastars (*P. ochraceus*), rock crab (*Cancer antennarius*), Kellets whelk (*Kelletia kelletii*), octopus (*Octopus* spp.), and smaller predators such as the seastars *Leptasterias* spp. and *Henricia leviuscula* and gastropods of the genera *Ocenebra*, *Fusinus*, and *Mitra*. The common deposit feeders, scavengers and filter feeders are bat stars (*Asterina miniata*), anemones (*Anthopleura xanthogrammica*, *A. elegantissima* and *Epiactis prolifera*), cup corals (*Balanophyllia elegans*), sponges (*Tethya aurantia* and various abundant encrusting forms), tunicates (*Styela monteryensi* and the encrusting colonial/social tunicates), tube snails (*Serpulorbis squamigerus*) and brittle stars (primarily *Ophiothrix spiculata* and *Ophiactis simplex*). Invertebrate grazers include the nudibranchs *Phidiana hiltoni* and *Doriopsilla albopunctata*.

Fish Resources: Fish resources along the central California coast are rich and diverse, in part due to highly productive upwelling in the region and the diversity of habitats. Over 500 taxa of nearshore fishes have been documented. Habitat structure and fish assemblages along the Diablo Canyon coastline are similar to other rocky nearshore areas in central California. The nearshore fish fauna in the Diablo Canyon area is characterized by taxa with mostly northern affinities, but some with southern affinities. A total of 96 taxa have been observed within the study area in conjunction with the TEMP monitoring work (1976-1995). None of the taxa in the ISFSI project vicinity are considered to be endemic and none are federally or state listed as rare or endangered.

Intertidal Resources: Thirty intertidal fish taxa were identified from the intertidal zone of the Diablo Canyon study area during the period of 1979 to 1995, an assemblage similar to that described in other central California rocky coast intertidal habitats (Reference 42). Some taxa are restricted to the intertidal zone, but most of these fish extend their distributions into the shallow subtidal zone. Several intertidal fishes are commonly associated with various algal species which they either use directly as a food source (Reference 43) or gleen other foods from their surfaces (Reference 44).

Common fish found in the intertidal zone are black prickleback, (*Xiphister atropurpureus*), rock prickleback (*X. mucosus*), high cockscomb (*Anoplarchus purpurescens*), sculpins (*Artedius* spp. and *Oligocottus* spp), clingfish (*Gobiesox maeandricus*), monkeyface eel (*Cebidichthys violaceus*), rockweed gunnel (*Xererpes fucorum*), and penpoint gunnel (*Apodichthys flavidus*). Over 90 percent of the individual fish in the intertidal zone of the

project area are small eel-like fishes of the family Stichaeidae (pricklebacks) and Pholidae (gunnels).

Subtidal Resources: The majority of individual fish which occur in the nearshore Diablo Canyon area as either adults, juveniles or young-of-the-year (YOY) belong to the Scorpaenidae (rockfishes), Embiotocidae (surfperches), Cottidae (sculpins), Labridae (wrasses), and Hexagrammidae (greenlings). Other schooling fish which can be very common at certain times and areas include northern anchovy (*Engraulis mordax*), pacific sardine (*Sardinops sagax*), jack mackerel (*Trachurus symmetricus*) and tubesnout (*Aulorhynchus flavidus*). Species are identified in Table 2.3-5.

Because of the proximity of Diablo Cove to Pt. Conception, fishes with more southern affinities are occasionally found in the area, especially during warm-water years. Sheephead, (*Semicossyphus pulcher*), blacksmith (*Chromis punctipinnis*), kelp bass (*Paralabrax clathratus*), white seabass (*Atractoscion nobilis*), giant kelpfish (*Heterostichus rostratus*), garibaldi (*Hypsypops rubicundus*), and bluebanded gobies (*Lythrypnus dalli*) are among the taxa that can either migrate as adults or be transported from south to north as larvae. These taxa, however, do not normally establish reproductive populations in the area.

Marine Mammal Resources: At least 21 species of cetaceans (whales, dolphins and porpoises) have been reported in central California but few are common to the Diablo Canyon vicinity. Gray whales (*Eschrichtius robustus*) and bottlenose dolphin (*Tursiops truncatus*) have been observed in Diablo Cove within the discharge plume of DCPP and orca (*Orcinus orca*) have been observed within the offshore kelp beds.

The four common, residential marine mammals in the Diablo Canyon vicinity are California sea lions (*Zalophus californianus*), harbor seals (*Phoca vitulina*), northern elephant seals (*Mirounga angostrirostris*), and southern sea otters (*Enhydra lutris*).

Seasonally, several hundred sea lions "haulout" (seek resting habitat on dry land) on Lion Rock, Pup Rock, and Pecho Rock. Diablo Rock is small in comparison and provides marginal haulout habitat for a few sea lions. Local populations reach their peak in the fall as the breeding populations disperse from the Channel Islands in the Southern California Bight. Sea lions are wide ranging and may be found along the entire central California coastline. Northern (Steller) sea lions are rare in the Diablo Canyon study area but have been observed occasionally on Lion Rock (Reference 45).

Harbor seals are common, year around residents in the Diablo Canyon vicinity. Aerial censuses along the coastline between Morro Bay and Pt. San Luis by California Department of Fish and Game recorded approximately 2,000 seals in 1991 (Reference 46). Harbor seals are observed to breed and pup in the area including the Intake Cove of DCPP. The many haulout sites used by harbor seals between Pt. Buchon and Pt. San Luis are usually flat rock benches or rocks lying on headlands or just offshore or small pocket beaches surrounded by high cliffs inland.

A small seasonal aggregation of approximately 50 northern elephant seals began using the Intake Cove in 1986 as a resting and molting site (Reference 47). The haulout site was never used for breeding or pupping, and was last used by elephant seals in spring 1992. Migrating elephant seals pass through the Diablo Canyon area and are commonly observed in the Intake Cove at DCPP, but the nearest concentration of seals (over 3,000) seasonally occupies beaches in the vicinity of Point Piedras Blancas, approximately 69 km (43 mi) north of DCPP.

2.3.2.1.3 Listed and Proposed Threatened and Endangered Species

There are no marine algae, invertebrates or fish known from California coastal waters that are currently listed or proposed for listing either by the state or federal government as threatened or endangered. There are however, several important taxa within these groups. Surfgrass is recognized by the CDFG as a sensitive resource. Similarly, abalone resources south of San Francisco are recognized in need of protection, and no harvesting has been allowed in this area since 1997. Bocaccio rockfish are not a protected resource in the state but their numbers have declined in recent years causing some concern among CDFG biologists.

Among those marine mammals that frequent near-shore areas within the ISFSI Site Vicinity, the southern sea otter is listed as threatened under the federal Endangered Species Act.

One marine reptile, the green sea turtle, is known to occasionally frequent near-shore areas within the ISFSI Site Vicinity. This species is listed as threatened under the federal Endangered Species Act.

Several of the more important species located in the near-shore areas within the ISFSI Site Vicinity are the following:

SURFGRASS
(*Phyllospadix* spp.)
(References 48, 49, 50, 51)

ABALONE
(Red abalone, *Haliotis rufescens*, and black abalone, *Haliotis cracherodii*)
(References 25, 26, 27, 48, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61)

BOCACCIO
(*Sebastes paucispinis*)
(References 48, 62)

SOUTHERN SEA OTTER
(*Enhydra lutris nereis*)
(Federally listed as threatened; known to occur in near-shore marine habitats adjacent to DCPP)
(References 49, 63, 64, 65)

Regional and Local Distribution. The southern sea otter, which originally ranged from Baja California to at least Washington and perhaps to south-central Alaska, was generally considered extinct by 1920 (Reference 65). Apparently, however, a group of 50 to 100 individuals survived off central California in the vicinity of Monterey. By 1970, the population had grown to include about 1,800 individuals. The southern sea otter now regularly occurs along about 300 km of the central California coast, and recently, individual sightings have been documented as far north as Fort Ross, California.

A group of approximately 30 southern sea otters resides within the DCPP intake cove. These animals typically overnight within the cove and disperse to offshore foraging areas during the day.

Conservation Status. Southern sea otter is currently listed under the federal Endangered Species Act as threatened (January 14, 1977).

Status on Diablo Canyon Lands. Sea otters in the vicinity of DCPP have been monitored since 1973. Benech (Reference 49) conducted monthly surveys on the sea otter population from Pt. Buchon to near Pt. San Luis. Average population size has varied over the years, but has seasonally ranged from less than 40 to over 100 individuals. In recent years, the study area population has remained relatively stable with an annual mean of approximately 70. Their distribution is known to change with local conditions and their population size appears to be largely influenced by the availability of food resources, suitable resting sites, pupping success, and movement of otters between adjacent coastal areas. Females and pups now dominate the study area, representing about 95 percent of the resident population. The females and pups form "rafts" where they float in small groups while resting and grooming.

Habitat Suitability. Although the sea otter is a marine mammal, it rarely ventures more than 1 km from shore. It forages in both rocky and soft-sediment communities, on or near the ocean floor. Off California, sea otters seldom enter waters of greater depth than 20 m. The sea otter is capable of spending its entire life at sea, but sometimes rests on rocks near the water. The diet consists mainly of slow-moving fish and marine invertebrates, such as sea urchins, crabs, abalones, and other mollusks.

Mapping Criteria. Preferred rafting locations in the immediate vicinity of the power plant include the protected areas of the Intake Cove, north Diablo Cove, and Lion Rock.

Local Endangerment Factors. Since receiving federal and state protection, the species has increased significantly in numbers throughout its current range. Local populations are affected to some extent by natural mortality factors such as predation and disease. Other factors affecting the abundance and availability of food resources also contribute to population fluctuations.

GREEN SEA TURTLE
(*Chelonia mydas*)
(Federally listed as threatened; an infrequent visitor to near-shore marine habitats adjacent to DCPP)
(Reference 64)

Regional and Local Distribution. On the Pacific coast, the green sea turtle was once common as far north as San Quintin Bay, Baja California, and occasionally reached bays along the coast of extreme southern California. It was formerly common in San Diego Bay. It is an occasional visitor along the Pecho Coast in the vicinity of DCPP.

Conservation Status. This species is listed as threatened under the federal Endangered Species Act (July 1978) due to declining populations and limited breeding areas.

Status on Diablo Canyon Lands. Green sea turtles have been recorded in the Diablo Canyon vicinity. On two occasions in 1977, once in 1994, once in 1998, and once in 1999, green sea turtles were found in the forebay of the DCPP intake structures. On each occasion, the turtle appeared unharmed and swam freely once returned to the open ocean.

Habitat Suitability. The green sea turtle inhabits lagoons and bays of the continental shores and oceanic islands, especially where there are sandy beaches. It is most often encountered in relatively shallow water where it feeds upon marine plants, but individuals are also occasionally seen considerable distances from shore. Beds of algae (seaweed) or eelgrass are likely places of occurrence. Rock cavities may be used as places of retreat. The Pecho Coast affords little in the way of nesting habitat for this species.

Mapping Criteria. Protected coves, bays, and inlets along the Pecho Coast.

Local Endangerment Factors. None identified.

2.3.2.1.4 Keystone Species

Using the definition given in Section 2.3.1.2.4, several species of algae, invertebrates, fish and one marine mammal qualify as keystone species.

Among the algae, the larger canopy forming kelps, especially *Macrocyctis* but including *Nereocyctis* (bull kelp) and *Cystoseira*, influence the plant and animal communities wherever they grow by providing structure in the water column, and as a source of food and shading in the understory areas (Reference 32).

Invertebrate predators influence the distribution of their prey species (Reference 66). In the Diablo Canyon area, the predominant predators are seastars such as the sunflower seastar *Pycnopodia* and the species of *Pisaster*. Their prey includes various shelled gastropods, mussels and barnacles. Sea urchins (*Strongylocentrotus* spp) are algal grazers and have a dominating effect on the distribution and abundance of large brown algae (Reference 67).

This effect is mirrored in the character of the biotic assemblages on rocky reefs (Reference 32).

Two fish which are considered keystone predators are lingcod and sheephead. Lingcod are top predators which eat mainly other fish. Sheephead eat primarily invertebrates including sea urchins and they can be important in regulating this important grazer (Reference 68). However the top predator in the nearshore marine environment, the animal which has the most profound effect on the algal and invertebrate community structure, is the sea otter (References 69 and 70). Gotshall et al. (Reference 27) considered the series of changes in the plant and animal communities in the Diablo Canyon area following the arrival of sea otters to the area in 1974, to be the most dynamic and long-lasting of all impacts, natural or man-caused, that they observed.

2.3.2.1.5 Commercial and Recreationally Important Species

A listing of the commercial and recreationally important species known to occur or potentially occurring in nearshore habitats within the ISFSI Site Vicinity is presented in Table 2.3-6.

2.3.2.1.6 Preexisting Environmental Stresses and Status of Ecological Succession

Sources of preexisting environmental stresses in the ISFSI Site Vicinity include two natural phenomena (El Nino events and the reestablishment of the sea otter to the area) and one man-caused event (power plant operation). Dayton et al. (Reference 71) discuss some of the effects attributable to El Nino climate patterns and sea otters in the vicinity of Diablo Canyon. Many studies, including Tenera Inc. (Reference 48), have described the effects of power plant operation on the nearshore marine environment at DCPP. These topics are also referenced in Section 2.3.2.1.7.

2.3.2.1.7 Importance of Study Area as a Regional Resource

The nearshore marine environment in the ISFSI Site Vicinity is characterized by a high intrinsic biodiversity common to the central California coast. As a result of the local variations in coastal water temperatures and proximity to generally warmer waters of the Southern California Bight, the marine communities of the central California coast consist of a mixture of warm-temperate species and cool-temperate species. It is in this respect that the central California coast represents an ecological transition zone, sharing faunal affinities with biological assemblages found both to the north and south. As a result, although the area around Diablo Canyon is dominated by cool-temperate species, species with warm-temperate distributions found primarily south of Pt. Conception are also indigenous to the area (Reference 72).

2.3.2.1.8 Historic Effects on Local Populations (Infestations, Epidemics, and Catastrophes)

Table 2.3-7 summarizes some known historic effects on populations of marine organisms from the vicinity of DCPP. The source of the effect, appropriate dates, organisms known to have

been locally affected, the nature of the effect, and at least one published source that documents what occurred are provided.

2.3.2.2 Freshwater Ecology

2.3.2.2.1 Species and Relative Abundance

Diablo Creek and Coon Creek are the only streams on the Diablo Canyon Lands that contain fish. Fish sampling efforts on both streams documented the presence of self-sustaining populations of rainbow trout (*Oncorhynchus mykiss*), but no other fish species have been observed. In 1986 and 1990, fish sampling in Diablo Creek showed relatively low numbers of trout with a high ratio of adults (greater than 4 inches) to juveniles. The portion of the creek above Diversion Point 1 (upper reaches starting about one-half mile above the ISFSI site) supported higher numbers of rainbow trout than that found below the diversion. This is due, primarily, to better overall habitat conditions above the diversion. Thirty-three invertebrate taxa were also identified from Diablo Creek (Table 2.3-6).

The other drainages on the property are small ephemeral streams. South of DCPP the primary drainages are Irish Canyon Creek and Pecho Creek. Stream surveys conducted on PG&E-owned lands from 1992 through 1993 found no fish present in streams south of the power plant.

Man-made ponds have been constructed at three locations in ephemeral drainages south of the power plant and one location to the north. These ponds were developed to provide irrigation water for row crops and drinking water for cattle. Ponds to the south of the power plant were surveyed for presence of fish in 1990 (Reference 73), and again in 1993 (Reference 74), and none were found. It has been reported that the pond located north of the power plant was planted with several species of fish including trout from Coon Creek, by a local caretaker; date unknown (Reference 73). When sampled in 1990, three-spined stickleback *(Gasterosteus aculeatus)*, not the federally listed subspecies *williamsonni,* and mosquito fish *(Gambusia affinis)* were identified in the pond, while two specimens of larger fish were not identified. The larger fish may have been either trout, black bullheads *(Ictalurus melas)*, or largemouth bass *(Micropterus salmoides)* (Reference 73).

2.3.2.2.2 Species/Habitat Inventories

Watershed Descriptions: Figure 2.3-1 shows the location of streams on PG&E-owned lands within the ISFSI Site Vicinity. All streams on the Diablo Canyon Lands have intermittent surface flow and are fed by springs. Generally flowing in a south-to-southwesterly direction, they are characterized by reaches where the flow of water becomes subsurface during the summer and fall. The primary watersheds north of DCPP are Coon Creek and Diablo Creek. Coon Creek, located at the northern boundary of PG&E-owned lands, drains a watershed of 5,500 acres. Continuous surface flow occurs in the lower reaches only, with intermittent flow elsewhere. This stream contains a self-sustaining population of rainbow trout. Most of the watershed consists of steep slopes covered by chaparral and oak woodland vegetation types.

Diablo Creek, which flows through the ISFSI Site Vicinity beneath the 230-kV and 500-kV switchyards, drains a watershed of 3,190 acres. This stream also supports a self-sustaining population of rainbow trout. The watershed area is characterized by a mosaic of vegetation types on steep and moderately steep slopes.

South of DCPP, the primary drainages are Irish Canyon Creek, and Pecho Creek. These two streams represent a combined watershed area of less than 4,000 acres. Surface water flow is intermittent during the dry months. Riparian vegetation is less well developed and composed of fewer species than that associated with either Coon Creek or Diablo Creek to the north. Stream surveys conducted on PG&E-owned lands from 1990 through 1993 found no fish present in streams south of the power plant.

An ecological profile of Diablo Canyon Creek was prepared by PG&E in 1991 (Reference 74). Although a comparable study of Coon Creek has not been undertaken, its ecology is believed to be similar to that of the natural flow reaches of Diablo Creek. A description of the ecology of Diablo Creek, taken from (Reference 74) is presented below.

Geology And Soils: The Diablo Creek watershed is similar to many coastal canyons of the western San Luis Mountains, consisting of a narrow gently sloping coastal terrace with sharply rising adjacent uplands. Underlying the watershed is the Miocene Monterey formation, consisting of resistant hard siliceous shale and interbedded chert (Montano de Oro State Park 1988). The color is variable, generally white and brown to gray and reddish-brown on fresh surfaces, weathering to chalky white. The formation shows evidence of many sedimentary layers with great total depth. Individual beds are brittle and fracture easily, with thickness varying between 0.5 and 6 inches. Evidence of bedding is common from channel invert to ridge tops.

The length of the watershed is about four times its average width. Hillside slopes of 30 to 75 percent are common throughout. Upland soils on the steeper slopes are thin, with a shallow depth to parent material. They are typical of the loose, rocky, coarse-textured, acidic Santa Lucia soils; and are characterized by low fertility and low water retention capabilities.

Channel Morphology: The total channel length is about 5.1 miles from watershed ridge crest to ocean outfall. Surface water flow is intermittent seasonally over the lower 2 miles of stream channel. This may be true, as well, for the upper 3 miles of Diablo Creek. Detailed field surveys in this part of the watershed have not been undertaken. The banks of Diablo Creek in the areas inspected are composed of multiple strata of alluvial materials of varying thickness and composition, deposited over geologic time. At least one of the layers is composed of very porous cobble and gravel materials. In the lower watershed, channel banks are generally at a slope of 1:1 or steeper, with depths of 3 to 8 ft. Natural banks appear to be generally stable on a long-term basis, with mature oak trees and other vegetation growing down the channel bank. The channel slope, averaging about 5 percent throughout much of the watershed, is generally steep enough to prevent significant sediment or bed load deposition.

Extensive local geologic investigations have been made in conjunction with switchyard fill design. Results reported from test borings indicate that subsurface alluvial materials exposed in the channel invert may be as deep as 30 ft, extending up to 200 ft laterally from the channel. This finding is consistent with observed surface dewatering of significant segments of the Diablo Creek channel, except in periods of high flow. Subsurface water available in the extensive alluvial beds may be partially recovered in the wells at the lower end of the watershed.

PG&E began diverting water from three points on Diablo Creek, hereafter referred to as Diversion Points 1, 2, and 3, in 1968. Records maintained for purposes of necessary annual filings with the California State Water Resources Control Board show that Diversion Point 2 serves as a supplemental or backup source to Diversion Point 1, and both contribute raw water to the power plant makeup water system. Diversion Point 3 was a water source for dust control during early construction of DCPP (1968-1973) and is no longer in use. Figure 2.3-3 includes the locations of Diversion Points 1, 2, and 3. Diablo Creek currently provides approximately 30 percent of the power plant's required makeup water supply on a daily basis.

A natural waterfall (hereafter referred to as Diablo Falls) exists in the channel about 2 miles upstream of Diversion Point 1, or 3 miles above the ocean outfall (Figure 2.3-3). Bedrock conditions at Diversion Point 1 are believed to force migrating groundwater to the surface, where total flow may be measured. Flow over the waterfall was estimated at 300 gpm in early March 1991, about two to three times that observed on the same date at Diversion Point 1.

The lower 3 miles of creek channel is composed of deep and extremely porous cobbles and gravel of native materials. Such bed conditions result in subsurface flow of all or part of the total flow. This condition is influenced by the magnitude of flow and location in the watershed channel. Late season flow downstream of the waterfall is entirely subsurface for more than 1 mile. About one-third to one-half of the late season subsurface flow was observed to return to the surface at Diversion Point 1, where it is captured and used for power plant purposes. Some of the subsurface flow may also be captured by the freshwater wells immediately upstream of the 500-kV switchyard (Figure 2.3-3).

Erosion Potential: A uniform and healthy ground cover is desirable for maximizing water retention while minimizing erosion and sediment transport from steep hillside areas. A healthy plant community provides mechanical protection from rainfall, sheet, and rill erosion. The plant canopy provides surface protection from the thermal and convective effects of the air mass, helping to conserve and retain moisture. Organic matter also helps to improve soil infiltration and moisture retention. Ground cover in the watershed consists of a mosaic of plant communities in generally good hydrologic condition. Vegetative cover is poorest where rocky outcrops or road cuts prevent satisfactory soil depth for plant establishment. Sediment loading and erosion potential are maximum in areas where runoff flow is concentrated by road cuts, culverts, and equipment trails. Fuel load management areas where prescribed burns have recently occurred are at higher risk for runoff and erosion than similar untreated areas. A catastrophic event such as a large-scale range fire would be expected to change hydrologic conditions by increasing peak runoff flows and associated sedimentation, while reducing the

magnitude of late season return flows. Tower access roads in the lower watershed appear to be a significant source of sediment. Exposed cut and fill slopes lacking vegetation, and unprotected drainage features tend to concentrate runoff flows.

Hydrology: Peak runoff flows for different return periods were estimated using a Soil Conservation Service hydrologic model. Precipitation frequency data and watershed area measurements taken from the Port San Luis 7.5-minute USGS Topographic Quad were used to obtain the model outputs. These modeled values are statistical estimates of short-term peak runoff flows, which differ from the average residual flows. Rather than precise, estimates of this kind are order-of-magnitude in nature. The 3,200-acre watershed is drained by a 5.1-mile main channel with numerous ephemeral tributaries. Runoff is rapid because of steep slopes and the presence of shallow soils with low water-holding capacity in upland areas. Modeled short-duration peak flows at the watershed outlet for a 100-year storm (1 percent annual probability of occurrence) are estimated at between 500 and 2,500 cfs (0.22 to 1.12 million gpm; 1 cfs equals 450 gpm), and depend on assumptions made about upland soil and vegetation conditions. These extreme values are consistent with the 10-ft diameter culvert and emergency overflow channel designs used at the switchyard complex. Peak watershed runoff measured by PG&E staff to date is a flow of about 2,600 gpm after a day with 5 inches of rainfall in March 1980. Observed peak flows are lower than expected for a watershed of this size and steepness. This likely is a result of the highly porous nature of the watershed.

Maximum and minimum flows in Diablo Creek are highly variable. Average flows tend to be nearer the minimum flow values. Maximum flows reflect short-term conditions associated with storm events. Usually within 1 or 2 days following a storm, flows return to normal. Flows during the wet season (October through April) vary daily and monthly. Dry season flows are sustained by groundwater seepage and are more consistent from day to day, gradually tapering off over time.

To date, the highest recorded flow (2,596 gpm) occurred in March 1980, when in one day, 5 inches of rainfall were recorded. Average maximum flows during the wet season range between 500 and 1,000 gpm. The lowest recorded flow to date (32 gpm) occurred in October 1968. During the mid-1970s drought, minimum flows (average of mean monthly data) were about 200 gpm. Applying this statistic to flow data for the 1970s 5-year drought shows minimum flows averaging about 65 gpm, or 32 percent of the minimum flows recorded during the last significant statewide drought.

Aquatic Biology: An aquatic survey of Diablo Canyon Creek was performed by PG&E biologists in 1986. Sampling occurred in four distinct stream sections within the lower 1 mile of the channel. Section 1 includes the mouth of Diablo Creek from the west edge of the lower access road, near the turbine building, to the ocean. Section 2 is the channelized open reach from the lower access road east to the downstream end of the switchyard culvert. Section 3 lies upstream of the switchyard culvert and includes the reach within which the raw water diversion facilities are located. Section 4 lies upstream of Diversion Point 1. Figure 2.3-3 identifies the location of Stream Sections 1 through 4.

Thirty-three invertebrate taxa and one fish (rainbow trout) were identified in the 1986 aquatic survey of Diablo Canyon Creek. Rainbow trout are the only fishes known to occur in Diablo Creek, and they are present in all 4 stream sections. They occur in upstream areas where surface water flow is present throughout the year. They also occur in pools that remain watered when adjacent stream reaches are reduced to subsurface flows. Thirty-five adult trout (greater than 4 inches) were collected during sampling in April 1986, and 27 adults and 5 juveniles were collected in May 1986. This ratio of juveniles to adults is considered low, and suggests either low reproductive success or high juvenile mortality.

In the 1986 survey, only the lower 300 ft of Section 4 was sampled. Yet, results showed trout four times more abundant here than in Sections 1 through 3. This is attributed to better overall habitat conditions in Section 4. A second field survey of this same reach of stream was conducted by PG&E biologists in November 1990. At that time, surface water flow was continuous over the sampled reach. A total of 11 rainbow trout were identified, ranging in size from 3 to 5.6 inches (Reference 73).

Because of the intermittent nature of surface flows in Diablo Creek, trout tend to concentrate in still pools or where flowing water is present year-round. An example is the plunge pool formed by the outflow of water through the switchyard culvert (Section 2). During the 1986 field survey, five adult trout (one measuring 11 inches) were identified here. Several dozen trout were also observed in the pool located at Diversion Point 2.

The primary factor limiting trout abundance in Sections 1 through 3 appears to be a lack of habitat, specifically, habitat capable of providing all life requisite needs through the dry season when surface flows are reduced and pools become isolated by dewatered reaches of stream channel.

Water Quality: The quality of water in Diablo Creek is affected by various factors. Some of these may include storm drain runoff, accidental spills, soil erosion within the watershed, and activity of livestock. Drinking water quality is determined annually as required by Title 22, Domestic Water Quality Standards. Samples are collected from the pumping station downstream of Diversion Point 1 and are sent to an analytical laboratory for processing. Results are submitted monthly to the San Luis Obispo County Office of Health Services.

Diablo Creek water is relatively low in scaling agents (compared to well supplies), which in high concentrations result in a reduction of heat transfer efficiency in boilers and heaters. The 2-mile reach of stream below Diversion Point 1 contains eight permitted discharge locations. No new discharge points will be created as a result of building and operating the ISFSI (ER Sections 4.1.4 and 4.2.4).

Water quality is further monitored according to conditions specified in NPDES Permit CA 0003751. Water from several yard storm discharge points is sampled once annually for grease and oil contaminants. Results of this monitoring are reported to the Central Coast Regional Water Quality Control Board (RWQCB). A report titled *Potential Effects of Storm Water Discharges on Diablo Creek* (PG&E 1986) provides analysis of 14 water quality

parameters and pollutants associated with yard and storm drain runoff samples. Other pollutants were also identified that could potentially enter the stream as a result of accidental spills. These data were then compared with published toxicity levels for aquatic organisms. The report concluded that pollutant levels in the sampled discharges were below concentrations known to affect rainbow trout, and the potential of storm and yard water runoff to cause adverse effects in Diablo Creek was mitigated by a short residence time and rapid dilution under storm flow conditions. The study was conducted during a relatively high runoff year placing greater emphasis on wet season than dry season flows. The presence of rainbow trout in Diablo Canyon Creek is an indication of good overall water quality, as rainbow trout are known to be sensitive to changes in a variety of water quality parameters. For this reason, rainbow trout are commonly used in bioassay studies conducted by water laboratories throughout California.

Riparian Vegetation: Riparian vegetation forms a narrow band along both sides of Diablo Canyon Creek in all open channel sections. It is characterized by the least amount of prior disturbance upstream from Diversion Point 3, reaching its best expression in the vicinity of Diablo Falls. This habitat type is dominated by extensive stands of red willow (*Salix laevigata*), big-leaf maple (*Acer macrophyllum*), elderberry (*Sambucus mexicana*), wild cucumber (*Marah fabaceus*), poison hemlock (*Conium maculatum)*, nettle (*Urtica holosericea)*, and rush (*Juncus balticus*). Although this habitat type is the least abundant in the watershed, it is characterized by a high index of floristic diversity and provides important habitat elements for fish and wildlife.

2.3.2.2.3 Listed and Proposed Threatened and Endangered Species

Two species, the south/central California coast steelhead *(Oncorhynchus mykiss)*, and the tidewater goby *(Eucyclogobius newberryi)* potentially occur in fresh water habitats within the ISFSI vicinity and region. The south/central coast steelhead is currently listed under the federal Endangered Species Act as threatened, whereas populations of the goby north of Orange County, California were proposed for delisting in June 1999. The goby's current status is endangered under the federal Endangered Species Act.

TIDEWATER GOBY
(Eucyclobius newberryi)
(federally endangered-proposed for delisting.)
(Reference 75)

Regional and Local Distribution. Tidewater gobies are discontinuously distributed throughout California, ranging from Tillas Slough (mouth of the Smith River) in Del Norte County south to Agua Hedionda Lagoon in San Diego County. Areas of precipitous coastlines that preclude the formation of lagoons at stream mouths have created natural gaps in the distribution of the goby. Local populations are known to occur with the Diablo Canyon Lands.

Conservation Status. The tidewater goby was officially listed as endangered by the US Fish and Wildlife Service in March of 1994. A proposed rule to delist the species in all portions of

its range north of Orange County was submitted in June of 1999. Critical habitat was designated for 10 coastal stream segments in San Diego and Orange Counties in December 2000.

Status on Diablo Canyon Lands. No tidewater gobies were documented in either Diablo Creek or Coon Creek during basic inventories of fish populations conducted during 1990.

Habitat Suitability. No suitable habitat is available in Diablo Creek. The creek has no estuary and ascends steeply over rocky substrate from the mouth upstream, precluding the occurrence of gobies. Coon Creek presents limited and marginal habitat for the tidewater goby at the very mouth of the stream. A small bar pool forms when the mouth of the stream is closed off, but this is limited in extent and seasonality. When the mouth of the stream is open, the pool drains significantly and the habitat is characterized by swift moving water.

Mapping Criteria. All life stages are known to use the upper end of lagoons, marshes, and slow moving estuaries with salinities less than 10 parts per thousand and depths generally less than 1 m. Only Coon creek presents any potential habitat and this just within the vicinity of the stream mouth. It is marginal at best because of its limited extent and temporal nature.

Local Endangerment Factors. Extended breaches of the bar at the stream mouth are likely to preclude the occurrence of the species within Coon Creek. No other habitat is available.

SOUTH /CENTRAL COAST STEELHEAD
(Oncorhynchus mykiss)
(Federally listed threatened.)

Differentiation between the common rainbow trout and its genetically similar ocean-going relative, the steelhead, is accomplished with certainty only through examination of DNA taken from sampled populations. This type of study has not been undertaken for populations of trout within Coon Creek and Diablo Creek. Although no records of adult steelhead trout are known from these streams, and fish sampled during the surveys discussed above lacked certain diagnostic traits of steelhead smolts (Reference 73), the occurrence of steelhead in these streams cannot be entirely ruled out. At the time of year when sampling occurred, resident rainbows would have been indistinguishable from juvenile steelhead. Populations of steelhead have been documented from streams within the ISFSI region, north of the power plant.

Regional and Local Distribution. South/Central Coast Steelhead are discontinuously distributed in coastal streams throughout the south/central coast of California. Steelhead have been documented to use San Luis Creek, immediately to the south of Diablo Canyon Lands, and are known to use several small creeks to the north of Diablo Canyon Lands including, Little Pico Creek, Big Pico Creek, and other coastal streams. Historically, steelhead are thought to have occurred in Cottontail Creek, a creek that currently runs into Whale Rock Reservoir, near Cayucos.

Conservation Status. The South/Central Coast Steelhead ESU was listed as threatened by the National Marine Fisheries in August 1977.

Status on Diablo Canyon Lands. The occurrence of sea-run rainbow trout (steelhead) has not been verified on Diablo Canyon Lands. Populations of resident rainbow trout have been documented to occur within Diablo Creek and Coon Creek. Individuals of the species may variously exhibit anadromy (meaning they migrate as juveniles from freshwater to the ocean, then return to spawn in freshwater) or freshwater residency. The relationship between these two life forms is poorly understood and it is not known with what frequency individuals that exhibit one life form (anadromy vs. fresh water residency) may cross over to assume the other mode.

Habitat Suitability. Diablo Creek is probably not accessible to upstream migrating steelhead due to potential migration barriers located near the mouth of the stream. While these same barriers would probably not prevent downstream migrants from reaching the sea, they do not facilitate completion of the anadromous life form's lifecycle. Resident fish are able to spawn, rear, and forage in the various riffle, pool, and run habitats afforded by the stream.

Coon Creek affords suitable riffle, pool, and run habitat for both resident and anadromous life forms of rainbow trout/steelhead. The stream provides forage, spawning, rearing, and holding habitat for the species. A partial or complete migration barrier does not exist for upstream migrants at the culverted road crossing approximately 3,000 ft upstream from the mouth of the creek. However, rainbow trout occur both below and above this barrier. The creek provides suitable forage, spawning, rearing, and holding habitat for the species both below and above the road barrier.

Mapping Criteria. The creek provides suitable forage, spawning, rearing, and holding habitat for the species. Habitat is characterized by the riffle, run, and pool complexes that typify trout streams.

Local Endangerment Factors. The road crossing a Coon Creek is characterized by a culvert that presently acts as a partial or complete migration barrier to upstream migrants. Rainbow trout are documented to occur both below and above the road crossing.

2.3.2.2.4 Keystone Species

There are no keystone aquatic species present on Diablo Canyon Lands.

2.3.2.2.5 Commercial and Recreationally Important Species

No commercially important species are known to occur in freshwater habitats within the Diablo Canyon Lands. The rainbow trout is the only recreationally important species occurring on Diablo Canyon Lands. Within the ISFSI Site Vicinity, no recreational use of these streams is allowed and public access is restricted.

2.3.2.2.6 Pre-existing Environmental Stresses and Status of Ecological Succession

Livestock Grazing: At present, livestock use within the watershed is considered to be moderate, and involves both cattle and goats. One cattle lease includes the watershed lands north of Diablo Creek and a second includes those lands to the south of the Creek. Goats are utilized to aid a program of wildland fuel management. Stock water has been developed within Ramiro Meadow on the north side of Diablo Creek, about one-half mile below Diablo Falls. This water is diverted from Diablo Creek through a 2-inch pipe placed in a natural pool above Diablo Falls. A second trough is found below the summit of Green Peak, on the North Slope. The source for this water is a 30,000-gallon redwood storage tank, located at the end of a short spur road branching off the road used to access the site overlook on Green Peak (Figure 2.3-3). A third trough is located adjacent to Dry Canyon Road, about 1/2 mile north of the turnoff to Ramiro Meadow. The source of this water is the old Field Ranch diversion and pump on Diablo Creek, downstream from Diversion Point 1 (Figure 2.3-3). Effects of livestock grazing within the riparian zone of Diablo Creek appear at this time to be minimal.

Livestock have been excluded from Coon Creek by electric fencing since 1991.

Fuel Management: The location of DCPP and related facilities adjacent to the wildland vegetation of Diablo Creek watershed has necessitated development of a fuel management program on watershed lands. The program goals are protection of the plant site, transmission lines, and workforce population from wildfire. The approach is the management of fuels within the watershed using controlled burning, brush clearing, controlled grazing, and selective application of herbicides.

Diablo Canyon has experienced two wildfires in the past 6 years. These fires have caused phase to ground arcing of the overhead transmission lines resulting in loss of onsite power. The fuel management program is essential to ensuring reliability of operation and overall safety at Diablo Canyon.

Water Diversion: A key aspect of Diablo Creek watershed is the presence of water diversion facilities supplying raw fresh water to the power plant makeup water system. Currently these facilities are designed to deliver approximately 30 percent of the required makeup water supply on a daily basis. PG&E began diverting water from Diversion Points 1, 2, and 3 (Figure 2.3-3) in 1968. Company records show that Diversion Point 2 served as a supplemental and backup source to Diversion Point 1 from 1968 to the early 1980s. During this time, Diversion Point 2 contributed about 5 to 15 percent of the total water extracted from Diablo Creek. A well casing embedded in the creek bed is still present, which can be used to extract subsurface water if needed. Diversion Point 3 was a water source for dust control during early power plant construction (1968-1973), and is no longer in use. At present, daily pumping rates are often lower than 200 gpm, and vary according to water demand.

The distance from Diversion Point 1 to the mouth of Diablo Creek is about 1.1 miles. Portions of the channel along this reach were greatly modified during construction of the 230-kV and 500-kV switchyards. Non-point-source discharges from adjacent areas of the

watershed and runoff from paved surfaces are channeled to the creek by a yard and storm water drain system. The magnitude and seasonal pattern of this accretion is not known, and no instream flow data is available below Diversion Point 1.

Approximately 900 ft below Diversion Point 1, Diablo Creek enters the culvert beneath the switchyard complex. Under normal flow conditions, surface water percolates into upstream alluvial channel materials and does not enter the culvert. A portion of the subsurface flow seeps from the ground supporting the culvert outfall where it daylights some 2,700 ft downstream. The seepage flow helps to maintain seasonal or annual pools in channel depressions in the reach below the switchyards. Surface flows in the areas above, within, and below the culvert occur only during larger storm and runoff events.

In the short reach of stream (500 ft) between the access road culvert and the mouth of Diablo Creek, yearlong surface flows are reported (quarterly observations by PG&E biologists, 1976-1991). No quantitative measure of these flows has been made. Qualitative estimates place the normal average dry season flow at no less than 3 gpm.

DCPP Facility Siting: The lower watershed area contains the 230-kV and 500-kV switchyards and certain other non-related operations centers. Makeup water treatment facilities and the raw water storage reservoir are also located here. The middle third of the watershed contains water diversion, pumping, and temporary storage facilities for the makeup water system. The upper watershed area contains numerous steel lattice transmission towers, tower access roads, and overhead conductors.

2.3.2.2.7 Importance of Study Area as a Regional Resource

The Diablo Canyon Lands include approximately 12 miles of Central California coastline, extending inland an average of about 1-1/2 miles, and are protected by restrictions on access and a program of land and resource stewardship developed and administered by PG&E. Two perennial and several ephemeral streams occur along this stretch of coastline. These streams are generally similar to other coastal streams within the region surrounding the ISFSI. Many of these drainages have been impacted, to some extent, by livestock grazing. Aquatic habitats present on Diablo Canyon Lands do not support a diverse assemblage of aquatic organisms, are not known to support or to potentially support populations of anadromous salmonids, and therefore are not of unique or significant regional importance.

2.3.2.2.8 Historic Effects on Local Populations (Infestations, Epidemics, and Catastrophes)

Historic effects on local aquatic resources include: (a) the construction (primarily the switchyards located over Diablo Canyon Creek) and operation of DCPP, (b) continuous season-long grazing by cattle, and (c) diversion of water for row crop irrigation and power plant uses.

Construction of the power plant switchyards resulted in the loss of approximately 2,200 ft of Diablo Canyon Creeks natural stream channel and associated riparian community. This reach

of stream now flows within a culvert located beneath the switchyards. Suitability of this reach of stream for trout is assumed to be nil, although no surveys of the culvert section have been made. Production of invertebrate biomass here is also assumed to be negligible. Upstream from the culvert section, some water is diverted from Diablo Canyon Creek both for livestock and as a component of the power plant make-up water system (Section 2.3.2.2.6). The effect of these diversions on aquatic organisms, including trout, was addressed in a report prepared by PG&E in June of 1993 (Reference 74). The report concludes that reducing or eliminating the diversion of water for power plant use would have some positive environmental effects, but would not change significantly the carrying capacity of the stream for trout, or enhance the growth and vigor of the riparian community except under conditions of severe and prolonged drought. As described in ER Sections 4.1.4 and 4.2.4 and shown in Table 4.1-1 of this ER, only small amounts of water will be required for construction and operation of the ISFSI.

Continuous season-long grazing allows the grazing animal to linger or frequently return to the vicinity of water sources, including natural streams, where availability of water, shade, and succulent vegetation combine to create favorable conditions. Historically, this form of grazing management has resulted in severe impacts to riparian vegetation, water quality and aquatic habitat values. PG&E prevented livestock access to Coon Creek in 1990 by construction of electric fencing along the adjacent marine terrace south of the stream. Significant natural rehabilitation of this stream's riparian vegetation has occurred since that time. About the same time, PG&E also replaced the traditional grazing scheme with a new program of grazing management involving the concept of high-intensity, short-duration management and established a monitoring program based on residual dry matter criteria developed by the University of California for the central coast rainfall zone. This form of grazing management has resulted in better control of grazing pressure, improved livestock distribution, better utilization of available forage, and release of native perennial grasses. This grazing program is in effect from Diablo Canyon Creek north on the Diablo Canyon Lands, where a cow-calf herd numbering approximately 140 head is maintained. South of Diablo Canyon Creek, stocker cattle are grazed seasonally and the range is without grazing animals several months out of each year.

Historically, water in lower Coon Creek was diverted to the adjacent coastal bluffs to irrigate row crops. This practice was discontinued in the late 1970s. Diversion of water from several ephemeral streams south of the power plant is still practiced to irrigate row crops planted on the marine terrace.

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2.4 CLIMATOLOGY AND METEOROLOGY

The climatology and meteorology of the Diablo Canyon area are described in Section 2.3 of the DCPP FSAR Update. Information in the FSAR Update includes discussion of the regional climatology, local meteorology, topographical information, onsite meteorological measurement program, and diffusion estimates for the Diablo Canyon owner-controlled area, which includes the ISFSI site. Relevant tables and figures supporting the discussion are also included in the FSAR Update.

Meteorological conditions for the ISFSI site are expected to be the same as for DCPP since the ISFSI site is located approximately 0.22 miles and slightly uphill from the DCPP facilities. No significant changes in climate or meteorological characteristics can occur within such a short distance and, thus, existing meteorological measurements for DCPP are expected to be equally applicable to the ISFSI. Diffusion estimates at the ISFSI site are provided in Section 2.4.4.

The FSAR Update is maintained up to date by PG&E through periodic revisions made in accordance with 10 CFR 50.71(e). Hence, the information contained in the FSAR Update is current, and no further revision is necessary for applicability to the ISFSI. Therefore, material from Section 2.3 of the FSAR Update is incorporated herein by reference in support of the ISFSI license application. The following paragraphs provide a brief summary of various discussions from the FSAR Update.

2.4.1 REGIONAL CLIMATOLOGY

The climate of the area is typical of the central California coastal region and is characterized by small diurnal and seasonal temperature variations and scanty summer precipitation. The prevailing wind direction is from the northwest, and the annual average wind speed is about 10 mph. In the dry season, which extends from May through September, the Pacific high-pressure area is located off the California coast, and the Pacific storm track is located far to the north. Moderate to strong sea breezes are common during the afternoon hours of this season while, at night, weak offshore drainage winds (land breezes) are prevalent. There is a high frequency of fog and low stratus clouds during the dry season, associated with a strong low-level temperature inversion.

The mountains that extend in a general northwest-to-southeast direction along the coastline affect the general circulation patterns. This range of mountains is indented by numerous canyons and valleys, each of which has its own land-sea breeze regime. As the air flows along this barrier, it is dispersed inland by the valleys and canyons that indent the coastal range. Once the air enters these valleys and canyons, it is controlled by the local terrain features.

The annual mean number of days with severe weather conditions, such as tornadoes and ice storms at west coast sites, is zero. Thunderstorms and hail are also rare phenomena, the

average occurrence being less than three days per year. The maximum-recorded precipitation in the San Luis Obispo region is 3.28 inches in 1 hour at the DCPP site, and 5.98 inches in 24 hours at San Luis Obispo. The 24-hour maximum and the one-hour maximum occurred on March 4, 1978.

The maximum-recorded annual precipitation at San Luis Obispo was 54.53 inches during 1969. The average annual precipitation at San Luis Obispo is 21.53 inches. There are no fastest mile wind speed records in the general area of Diablo Canyon; surface peak gusts at 46 mph have been reported at Santa Maria, California, and peak gusts of 84 mph have been recorded at the 250-ft level at the Diablo Canyon site.

2.4.2 LOCAL METEOROLOGY

The average annual temperature at the ISFSI site is approximately 55°F (based on measurements made at the DCPP primary meteorological tower). Generally, the warmest mean monthly temperature occurs in October, and the coldest mean monthly temperature occurs in December. The highest hourly temperature, as recorded at one of the recording stations, is 97°F in October 1987, and Diablo Canyon experienced below-freezing temperatures in December 1990 for several hours. Essentially no snow or ice occurs at the ISFSI site.

Solar radiation data considered representative of the Diablo Canyon ISFSI site is collected by the California Irrigation Management Information System (CIMIS), Department of Water Resources, at the California Polytechnic State University in San Luis Obispo, California. The CIMIS collection site is about 12 miles northeast of the Diablo Canyon ISFSI site. For a period of record between May 1, 1986, and December 31, 1999, the maximum measured incident solar radiation (insolation) values at the CIMIS site were 766 g-cal/cm^2 per day for a 24-hour period and 754 g-cal/cm^2 per day for a 12-hour period, both on June 1, 1989. The daily (24-hour) average for the period of record was 430 g-cal/cm^2 per day. For the Diablo Canyon ISFSI site, the insolation values would likely be lower than the CIMIS values because of more frequent fog in the ISFSI area.

The average annual precipitation in the area is approximately 16 inches. The highest monthly total recorded between 1967 and 1981 was 11.26 inches. The greatest amount of precipitation received in a 24-hour period was 3.28 inches. These maxima were recorded in January 1969 and March 1978, respectively. The maximum hourly amount recorded in the Diablo Canyon area during the same period is 2.35 inches.

The highest recorded peak gust at the primary meteorological tower is 84 mph, and the maximum-recorded hourly mean wind speed is 54 mph. Persistence analysis of wind directions in the Diablo Canyon area shows that, despite the prevalence of the marine

inversion and the northwesterly wind flow gradient along the California coast, the long-term accumulation of emissions in any particular geographical area downwind is virtually impossible. Pollutants injected into the marine inversion layer of the coastal wind regime are transported and dispersed by a complex array of land-sea breeze regimes that exist all along the coast wherever canyons or valleys indent the coastal range.

Topographical influences on both short-term and long-term diffusion estimates are pronounced in that the ridge lines east of the ISFSI location extend at least to the average height of the marine inversion base. The implications of this barrier are:

(1) Any material released that is diverted along the coastline will be diluted and dispersed by the natural valleys and canyons that indent the coastline.

(2) Any material released that is transported over the ridge line will be distributed through a deep layer because of the enhanced vertical mixing due to topographic features.

2.4.3 ONSITE METEOROLOGICAL MEASUREMENT PROGRAM

The current onsite meteorological monitoring system supporting DCPP operations will serve as the onsite meteorological measurement program for the ISFSI. The system consists of two independent subsystems that measure meteorological conditions and process the information into useable data. The measurement subsystems consist of a primary meteorological tower and a backup meteorological tower. The program has been designed and continually updated to conform with Regulatory Guide 1.23.

A supplemental meteorological measurement system is also located in the vicinity of DCPP. The supplemental system consists of two Doppler acoustic sounders and six tower sites. Data from the supplemental system are used for emergency response purposes to access the location and movement of any radioactive plume.

2.4.4 DIFFUSION ESTIMATES

For ISFSI dose calculations required by 10 CFR 72.104, (normal operations and anticipated occurrences), site boundary atmospheric dispersion factors (χ/Q) values range from 9.2×10^{-8} to 3.4×10^{-6} sec/m^3 and nearest residence χ/Q values range from 2.0×10^{-8} to 4.2×10^{-7} sec/m^3. These values are taken from Table 11.6-13 of the DCPP FSAR Update and have been determined to be applicable to the ISFSI site. They will be used, as appropriate, for dose calculations related to normal operations and anticipated occurrences.

Compliance with 10 CFR 72.106 requires calculation of design basis accident doses at the controlled area boundary (site boundary for the Diablo Canyon ISFSI), which is about 400 meters from the ISFSI at its closest point. Based on information from the DCPP FSAR

Update, Section 2.3.4 and Table 2.3-41, a χ/Q of 4.5×10^{-4} sec/m^3 has been determined to be a conservative estimate applicable to the ISFSI site and will be used for accident dose calculations.

2.5 HYDROLOGY

Hydrologic information pertaining to the Diablo Canyon area in general has been documented in the DCPP FSAR Update. Much of this information pertains also to the ISFSI location since the hydrologic characteristics in the Diablo Canyon area do not vary greatly in the general vicinity of the ISFSI and power plant facilities. Specific features relevant to hydrologic engineering at the ISFSI location are described in this section, with reference to supporting information in the FSAR Update where appropriate.

2.5.1 SURFACE HYDROLOGY

The topography and an outline of the drainage basin in the region surrounding the ISFSI site are shown in Figure 2.5-1. This drainage map is reproduced from the US Geological Survey (USGS) Port San Luis and Pismo Beach 7.5-minute topographic quadrangles. The basin drains to Diablo Creek, which discharges into the Pacific Ocean. Figure 2.5-2 shows the Diablo Creek drainage basin to a larger scale. The basin encompasses approximately 5 square miles and is bounded by ridges reaching a maximum elevation of 1,819 ft above mean sea level (MSL) at Saddle Peak, located approximately 2 miles to the east of the ISFSI.

The hydrologic characteristics of the ISFSI site are influenced by the Pacific Ocean on the west and by local storm runoff collected from the basin drained by Diablo Creek. The maximum and minimum flows in Diablo Creek are highly variable. Average flows tend to be nearer the minimum flow value of 0.44 cfs. Maximum flows reflect short-term conditions associated with storm events. Usually within 1 or 2 days following a storm, flows return to normal. Flows during the wet season (October-April) vary daily and monthly. Dry season flows are sustained by groundwater seepage and are more consistent from day to day, tapering off over time. There is no other creek or river within the site area or the drainage basin.

Potable water for the city of San Luis Obispo is obtained principally from Salinas Reservoir, approximately 23 miles east-northeast of the ISFSI site. Whale Rock Reservoir on Old Creek, 17 miles north of the site, and Chorro Reservoir, approximately 13 miles northeast of the site, are also used. A few small reservoirs are used in connection with the San Luis Obispo water system and are located approximately 18 miles northeast of the site. A reservoir in Lopez Canyon is 20 miles east of the site. Water is also imported into San Luis Obispo County from the California Water Project. Smaller towns in the region of San Luis Obispo depend on wells for domestic water.

There are two public water supply groundwater basins within 10 miles of the ISFSI site. Avila Beach County Water and Sewer District and the San Miguelito Mutual Water and Sewer Company provide water to the Avila Beach and Avila Valley area. An ocean water desalinization plant was built and has been in operation at DCPP since 1985.

The property owners to the north and south of the ISFSI site capture surface water from small intermittent streams and springs for minimal domestic use. Property owned by PG&E captures water from Crowbar Canyon, 1 mile north of the ISFSI site. PG&E's lessee captures water 2 to 4 miles south of the ISFSI site from streams and springs between Pecho Canyon and Rattlesnake Canyon.

2.5.2 FLOODS

2.5.2.1 Site Flooding

The DCPP FSAR Update addresses flood considerations pertinent to the power plant facilities at Diablo Canyon. The following discussion identifies flood considerations from the FSAR Update that are pertinent to the ISFSI location. Topography and ISFSI site structures limit flood design considerations to local floods from Diablo Creek. The canyon confining Diablo Creek remains intact and is more than sufficient to direct any conceivable flood from the drainage basin without significant hazard to the ISFSI. Channel blockage from landslides downstream of the ISFSI location to an extent sufficient to flood the ISFSI area is not possible because of the topographic location and elevation of the ISFSI.

There are no dams or natural features in Diablo Creek that would hinder or retain runoff for a significant period of time. At the ISFSI, runoff can be efficiently drained by the adjacent natural and constructed drainage features.

If the culverts and drainage out of the ISFSI area become plugged during periods of high precipitation, water may locally and temporarily pond. Drainage in the vicinity of the ISFSI is shown in Figure 2.5-3. No significant ponding should occur since, due to the open terrain and location, any additional runoff into the ISFSI area will drain away from the facility toward Diablo Creek or the ocean. No adverse impact is expected on ISFSI operation or spent fuel confinement.

The raw water reservoir is constructed in rock and located in the vicinity of the ISFSI to maintain a redundant water supply in support of operation of Units 1 and 2. If the reservoir were to overflow due to an unlikely accumulation of runoff from high precipitation, the local topography would cause water to drain toward the creek and ocean. No adverse impact on the ISFSI would be expected from overflow of the reservoir.

2.5.2.2 Probable Maximum Flood (PMF) on Streams and Rivers

Diablo creek is the only significant channel for the drainage basin within which the ISFSI is located. This drainage basin includes approximately 5.2 square miles. The potential PMF upstream of the location of the power plant facilities was found to have a peak discharge of approximately 6,900 cfs, with a total volume of approximately 4,300 acre-ft for a 24-hour storm.

As documented in the FSAR Update, the drainage capacity of Diablo Creek through this area is more than sufficient to efficiently channel the PMF volume directly into the Pacific Ocean with no retention time. This volume of water discharged from the Diablo Creek basin will not cause any local flooding around the power plant or overtop the switchyards, even if the 10-ft diameter culvert passing under the switchyards were to temporarily plug. If the culvert were plugged, any water impounded east of the 500-kV switchyard would be discharged along Diablo Creek Road (elevation of approximately 250 ft MSL opposite the ISFSI) and through the stilling basin located between the switchyards. The floodwaters would pass through the diversion scheme with adequate freeboard near each switchyard, on the opposite side of the canyon, and below the elevation of the ISFSI (310 ft MSL). The water released would not cause any flooding of the ISFSI.

2.5.3 FLOODING PROTECTION REQUIREMENTS

There are no dams in the watershed basin; seismic-induced failure of dams outside the watershed could not affect the ISFSI. Due to the elevation of the ISFSI, there is no credible scenario that can create any flooding due to probable maximum surge, seiche, or tsunami. Flooding due to ice melt events is not credible because of the mild climate and infrequency of freezing temperatures in this region.

No cooling water canals, reservoirs, rivers or streams are used in operation of the ISFSI. There are no channel diversions in the region that can alter any water flow patterns as to affect the ISFSI. Hence, low flow conditions need not be considered.

Based on these considerations, there are no credible hydrological scenarios that can adversely affect the ISFSI. Thus, specialized hydrological engineering considerations and flood protection requirements for the ISFSI facilities are not necessary. Only typical grading and drainage provisions for storm runoff are needed.

2.5.4 ENVIRONMENTAL ACCEPTANCE OF EFFLUENTS

Best management practices for effluent management are discussed in Sections 4.1 and 4.2 of this ER. Surface runoff from the ISFSI has no radioactive contamination and will not adversely affect the surrounding ecosystem.

Diablo Creek is the only source of surface water other than ocean water used at DCPP for support of power plant operation. Potable water used to support ISFSI administration is provided by existing systems at DCPP. Such support of ISFSI administrative activities will be provided according to plant procedures. No other significant surface or groundwater sources exist or are used in this area. There is no public use of any surface waters or groundwater from the Diablo Canyon site. Therefore, no detailed analysis of acceptance of effluents by surface waters or groundwater due to ISFSI operation is relevant.

2.5.5 GROUNDWATER HYDROLOGY

This section is based on information provided in the DCPP FSAR Update and recent geotechnical investigations performed to characterize the ISFSI, CTF, and transport route.

2.5.5.1 Groundwater in DCPP Area

Groundwater in the DCPP area is found in the narrow, relatively thin gravel alluvium along Diablo Creek, in fractures in the bedrock of the Obispo Formation, and along the contact that marks the top of bedrock and the base of some of the extensive terrace deposits that flank the coast. Two seeps and a small spring were encountered during excavations for the power plant.

The main groundwater table beneath the coastal terrace north and south of the power plant is controlled by sea level at the coastline and gradually rises beneath the hills southeast of the power plant. Hence, this water table beneath the power plant and the ISFSI is about the elevation of Diablo Creek, sloping upward from sea level at the coast to 200 ft above the 500-kV switchyard.

Groundwater in the alluvium of Diablo Creek is documented from the makeup water wells. Makeup water wells No. 1 and No. 2 with collar elevations at 232 ft above mean sea level (MSL) and 329 ft MSL, respectively, produce water from the alluvium in Diablo Creek and from fractured sandstone and dolomite of the Obispo formation. The water table varies, depending on the month of the year, but is generally controlled by flows in the alluvium near elevation 200 ft MSL.

Groundwater above the base of the thick terrace deposits is recorded in several places. On the terrace north of Diablo Creek, monitoring wells MW-1 through MW-4 (collar elevations range between 115 and 210 ft MSL) at the closed waste holding pond showed water levels in 1985 at elevations between 64 and 127.5 ft MSL. In parking lot 7, south of DCPP, two piezometers in 1996 and 1997, recorded groundwater at a depth of 40 to 77 ft and recording a perched water table near the top of the wave-cut bedrock platform. Groundwater seeps also issue from a perched water table on the marine terrace platform (about 30 ft MSL) in Patton Cove. Local perched water tables also occur within the Obispo Formation above the marine bedrock platforms. These perched water tables occur on impermeable strata, such as clay beds, within the Obispo Formation. An example is the small spring that issues from the hillslope above and east of Patton Cove at elevation about 600 ft MSL. A few areas of dense vegetation indicative of seeps also issue from bedrock along the lower canyon walls of Diablo Creek below the raw water reservoir.

2.5.5.2 Groundwater at ISFSI

As discussed above, groundwater beneath the ISFSI site is controlled by the elevation of water in Diablo Creek that is at about elevation 100 ft MSL opposite the ISFSI. This is at least 190 ft below the ISFSI pads, which are at elevation 310 ft MSL.

Clay beds beneath the ISFSI could impede groundwater infiltration and form temporary perched water tables during the rainy season. In all but one of the 15 borings drilled at and near the ISFSI site, no evidence of a perched water table was found during drilling. Typically the clay beds in the core were moist, but not saturated, indicating no perched water at the time of drilling. However when boring 01-F was being drilled on the slope above the ISFSI a rainstorm soaked the Diablo Canyon area in the night. The next morning clear water was observed issuing from the borehole that was 29 ft deep, but the flow stopped and was at 6.5 ft deep by the time the drilling was started; analysis of the boring shows a very thin clay on bedding at 6.8 ft but other clay beds are deeper than 29 ft. These data confirm that temporary perched water can accumulate locally in the slope above less permeable beds. In addition the dense vegetation, indicative of moist rock, is 20 to 30 ft above Diablo Creek in the lower canyon wall north of the ISFSI. This and other seeps are evident in the upper canyon wall north of the ISFSI site mark perched water probably seeping out above impermeable beds.

2.5.5.3 Groundwater at CTF

Groundwater levels below the CTF are near the elevation of Diablo Creek, at elevation 100 ft MSL, as described in Section 2.5.5.2. This is at least 190 ft below the CTF, which is at elevation 310 ft MSL.

2.5.5.4 Groundwater Along Transport Route

The main groundwater levels beneath the transport route are controlled by the elevation of water in Diablo Creek (25 to 75 ft MSL) near DCPP and the ISFSI and by sea level along the coastal terrace. Estimated groundwater levels beneath the transport route are as follows:

Plant View and Shore Cliff Roads - The route crosses the lower marine terraces and the regional groundwater table probably is slightly above sea level and is more than 50 to 100 ft below the roadway. In places, a perched groundwater table occurs, locally above the contact between the bedrock and the overlying marine terrace. This perched water is 30 to over 50 ft below the roadway.

Reservoir Road - The route generally follows the hillside where the road has been cut into dolomite and sandstone bedrock of the Obispo Formation. The strata dips into the hillslope away from the road. The regional groundwater in this area lies near the same elevation (about 100 ft MSL) as beneath the ISFSI site (Section 2.5.2), some 50 to 140 ft below the roadway. The clay beds in the sandstone bedrock may become temporary groundwater

barriers that slow the percolation of water through the fractured rock of the slope, but these beds dip into the slope away from the road and no seeps indicative of perched water are known along this part of the slope.

2.5.5.5 Groundwater Summary

Based on available information, groundwater quality or quantity is not expected to be affected by construction or operation of the ISFSI, CTF, or access road. Construction and operation of the ISFSI does not involve the use of groundwater, and there is no public use of onsite groundwater. The occurrence of temporary perched water over clay beds in the dolomite and sandstone bedrock that underlie the slopes above the ISFSI and the transport route has no adverse effects on the ISFSI or the transport route because any potential effect will be mitigated by drains in the proposed cutslopes above the ISFSI, or other means as described in the ISFSI Safety Analysis Report (Section 4.2.1.1.9).

2.5.6 CONTAMINANT TRANSPORT ANALYSIS

The spent fuel at the ISFSI will be maintained in dry storage casks. There will not be any routine effluent releases or any credible off-normal events or accidents that could result in liquid effluents. Therefore, no contaminants from the ISFSI will affect surface or groundwaters in the vicinity.

2.6 GEOLOGY AND SEISMOLOGY

Section 2.6 of the Diablo Canyon ISFSI SAR describes and evaluates the geologic and seismic conditions for the region around the Diablo Canyon ISFSI site. It also provides detailed information regarding foundation conditions and stability, slope stability, and potential vibratory ground motions at the ISFSI site, the related cask transfer facility (CTF), and the transport route between the fuel handling building and the CTF.

Because the ISFSI site is located at the DCPP site, geologic and seismic information for the operating plant, which has been docketed with the NRC, is applicable to the Diablo Canyon ISFSI, CTF, and transport route, and is referred to herein. The regional geologic and seismologic investigations at the DCPP site have been documented in the DCPP FSAR Update (Reference 1). The seismic design bases for DCPP were reevaluated during the Long Term Seismic Program (LTSP), which was carried out in response to License Condition 2.C.(7) of the Unit 1 Operating License DPR-80. In June 1991, the NRC issued Supplement Number 34 to the Diablo Canyon Safety Evaluation Report (Reference 2), in which the NRC concluded that PG&E had satisfied License Condition 2.C.(7). The LTSP evaluations are docketed in the LTSP Final Report (Reference 3) and the Addendum to the Final Report (Reference 4). Additional detailed information on the ISFSI site, including the CTF and transport route, is provided in Section 2.6 of the SAR, which supplements that contained the DCPP FSAR and LTSP documents.

2.6.1 PRINCIPAL FINDINGS - ISFSI SITE

The following principal findings of the geologic and geotechnical investigations of the Diablo Canyon ISFSI region and ISFSI site are summarized from SAR Section 2.6. The ISFSI site investigations included geologic mapping, drilling and logging of exploratory diamond core borings, excavation of trenches for rock mass characterization, petrographic and X-ray analyses, surface seismic refraction surveys, in-hole seismic velocity logging and video imaging, laboratory testing of rock and soil samples, slope stability analyses, and assessment of the engineering properties of the rock underlying the ISFSI site. No geologic hazards or adverse geologic or geotechnical conditions were identified that would preclude construction and operation of an ISFSI.

(1) The bedrock adjacent to and beneath the ISFSI site consists of Miocene sedimentary and volcanic bedrock of the Obispo Formation. The ISFSI pads and CTF are located within a former excavation (borrow) site that was used to provide fill material for the 230-kV and 500-kV switchyards. The bedrock consists of dolomite and sandstone strata that are locally weathered and altered to a friable rock. A diabase intrusion lies a few hundred ft north and northeast of the ISFSI site.

(2) The ISFSI and CTF sites will be founded on sandstone and dolomite that is stable and able to support the loads imposed by the pad and casks.

(3) The ISFSI is located on the southern flank of the northwest-trending Pismo syncline. This syncline is a major regional structure that lies within the Irish Hills structural block.

(4) The ISFSI is located in an active tectonic region of coastal Central California that has a moderate level of seismicity. It lies within a broad zone that forms the San Andreas Fault system in this region. The ISFSI is 48 miles west of the main San Andreas Fault and is about 3 miles east of the offshore Hosgri fault zone. Current tectonic activity in the area of the ISFSI is marked by active strike-slip faulting along the Hosgri fault zone and reverse faulting within the Los Osos-Santa Maria Domain that includes the Irish Hills structural block.

(5) The earthquake potential of all significant seismic sources in the region has been characterized. The Hosgri fault zone is the controlling seismic source for DCPP and the ISFSI.

(6) Design-basis ground motions for DCPP consist of the design earthquake, double design earthquake, and Hosgri earthquake. The ISFSI and CTF will be placed on sandstone and dolomite bedrock having the same characteristics as that on which DCPP is constructed. The ISFSI is also located at about the same distance from the Hosgri fault as DCPP. Hence, the DCPP ground motions are appropriate for the design of the ISFSI and CTF. The ground motions for DCPP that were developed during the LTSP for purposes of seismic margin analysis are used as an additional set of ground motions for evaluation at DCPP in accordance with SSER 34 and are used as a design basis for the ISFSI.

(7) Extensive studies of the potential for surface faulting on and in the vicinity of the DCPP site were conducted and reported in the DCPP FSAR and LTSP. These investigations included fault mapping, seismic geology trenching, and marine terrace mapping and surveying. The investigations showed that the Irish Hills structural block is currently being uniformly elevated along bounding faults, namely the Hosgri fault zone, the Los Osos fault zone, and the southwest boundary zone, but the block is not deforming internally. On the basis of these studies and the analysis of the additional geologic data obtained in the immediate vicinity of the ISFSI, there is no potential for surface faulting at the ISFSI location.

(8) Permanent cut slopes that will be excavated next to the ISFSI pads, as well as the hill slope above the ISFSI, are in sandstone and dolomite bedrock. Similarly the slope above the transport route is underlain by the same bedrock. These slopes have been analyzed for static and dynamic stability. All potential slope stability issues at the site can be readily mitigated using available conventional techniques.

(9) The cask transport route has been evaluated and determined to be capable of supporting the load imposed by the loaded cask transporter.

2.6.2 REFERENCES

1. Diablo Canyon Power Plant Units 1 and 2 Final Safety Analysis Report Update, Revision 14, November 2001.

2. NUREG-0675, Supplement Number 34, Safety Evaluation Report Related to the Operation of Diablo Canyon Nuclear Power Plant, Units 1 and 2, NRC, June 1991.

3. Diablo Canyon Long Term Seismic Program Final Report, PG&E, July 1988.

4. Addendum to the 1988 Final Report of the Diablo Canyon Long Term Seismic Program, PG&E, February 1991.

2.7 SOCIOECONOMICS

This section provides a description of the local social, economic and community characteristics of the area surrounding the ISFSI and includes factors associated with the residents of San Luis Obispo County. The ISFSI site is located in an isolated, rural, undeveloped area over 7 miles from a population area. The information provided gives an overall local and county description of the various characteristics of the area.

2.7.1 LOCAL AND COUNTY AREA

2.7.1.1 Historic And Natural Landmarks

The recorded history of San Luis Obispo County begins in 1542 when the first Spaniards were met by friendly Indians who presented gifts of acorns and fish to the explorers. The principal Indian tribe in the county was the Chumash, who buried their dead, spoke a dialect of the Hokan language, wove basketry, and made plank boats. Artifacts of the Chumash have been preserved in the San Luis Obispo County Museum and the museum of the San Luis Obispo de Tolosa Mission.

Actual settlement of the land began in 1772 when Father Junipero Serra established California's fifth mission (the county's first mission), named San Luis Obispo de Tolosa. In 1797, Father Fermin Francisco de Lasuer founded a second mission in the northern part of the County and called it San Miguel Arcangel.

Records of the earliest known visits to the area tell of a white trader who visited the Morro Bay area about 1587 and San Luis Bay about 1595. During Mexican rule, the land around Diablo Canyon was a part of one of the land grants made by the Mexican government to an individual. Since that early grant, the land has had many owners.

2.7.1.2 Economy

The economy of San Luis Obispo County is reasonably stable due to high employment with government agencies, including city, county, and federal agencies. Other important segments of the economy are tourism and retail. The county experienced steady growth through the 1970s and 1980s. In the 1980s, growth averaged about 2 percent while in the 1990s, growth controls and the California economy have limited growth to about 1 percent. An economic profile, taken from Reference 1, is shown in Table 2.7-1.

2.7.1.3 Income

The average family income in San Luis Obispo County for 2000 was $43,149 per Reference 1. The estimated population for 2001 was 245,191. The population employed within the county was 104,448 with a county unemployment rate of 3.0 percent.

2.7.1.4 Infrastructure

There is established infrastructure throughout most of the county that provides fire protection, electrical power, telephone service, cable television, natural gas, and water.

Almost all of the drinking water available in the county originates from well and spring sources. Most of the incorporated cities provide central water systems and operate well systems. These systems provide water for potable uses as well as fire protection. In rural areas, individual wells provide potable water for homes and farm operations. The DCPP site is supplied with water through wells located on site as well as a reverse osmosis facility. No central water systems are located within the ISFSI Site Vicinity.

There are a number of wastewater systems throughout the unincorporated and incorporated areas of the county, none of which are located within the ISFSI Site Vicinity. Where a wastewater system has not been established in a community or city, county septic tank systems have functioned well.

Electrical power is provided to virtually the entire county. Transmission and distribution power lines also cross through the county to serve other areas. Telephone and natural gas service is available to most of the county as well.

The management and disposal of solid waste is a service available in unincorporated and incorporated areas throughout the county. Presently, three landfills exist in the county. They are the Chicago Grade Landfill, the Cold Canyon Landfill, and the Paso Robles Landfill. The landfills provide recycling, composting, and conditioning waste that complies with all current regulations. The existing landfills are located more than five miles from the DCPP site.

2.7.1.5 Public Services

The California Department of Forestry (CDF) provides fire protection services in the unincorporated areas of San Luis Obispo County. City fire departments exist in every city in the county. There are seven cities located within the county, namely: Arroyo Grande, Atascadero, Grover Beach, Morro Bay, Paso Robles, Pismo Beach, and San Luis Obispo.

The DCPP Fire Department provides fire protection service to DCPP. CDF provides fire protection service as well, if requested from the DCPP Fire Department.

Police protection is provided by the San Luis Obispo County Sheriffs Department in the unincorporated areas throughout the county. City police departments exist in each city within the county. The California Highway Patrol provides police protection on the highways located within the county.

The San Luis Obispo Nuclear Power Plant Emergency Response system is in place throughout the county. The Emergency Alert System (EAS) consists of over 100 sirens set to alarm the population of any type of emergency, not just nuclear. The system is operated by the San Luis Obispo County Office of Emergency Services.

San Luis Obispo County is served by five major hospitals, namely: Arroyo Grande Community Hospital, French Hospital Medical Center, General Hospital, Sierra Vista Regional Medical Center, and Twin Cities Community Hospital. Each hospital provides medical services such as surgery, emergency, laboratory, and special medical care and testing required to serve a large community. A number of nursing homes and home health centers are available throughout the county. There are no public medical facilities located within 5 miles of the ISFSI site.

There are 78 private and public schools, K through 12 grades, in San Luis Obispo County. California Polytechnic State University and Cuesta College are also located in San Luis Obispo County. None of the schools are located within 5 miles of the ISFSI site.

There are 66 park and recreational areas within San Luis Obispo County. Montana de Oro State Park is the only recreational area within ISFSI Site Vicinity. The park is located approximately 4 miles northwest of DCPP. The maximum-recorded number of persons visiting the site at any single time is recorded at 5,000. Overnight use is considerably less, at an estimated maximum of 400. The total number of visitors during a 12-month period over the last five years averaged 600,000. These figures are provided by the State Department of Parks and Recreation.

2.7.1.6 Transportation

The County of San Luis Obispo is accessible via highway, rail, and air service, as shown in Figure 2.1-1.

US Highway 101 traverses the State of California from Los Angeles, through San Francisco, and continuing north to Oregon. Highway 101 serves as the main transportation corridor in the county. There are a number of highways running east and west, which intersect with that section of Highway 101 located within the county. No freeway exists within the county.

Union Pacific and Amtrak provide rail service to the county by a route that roughly parallels US Highway 101. There is no spur track access to the site.

The San Luis Obispo County Airport is located 12 miles east of the DCPP site. The airport serves approximately 52 scheduled landings and departures per day of commercial commuter flights, provided primarily by turbo-prop aircraft that seat no more than 41 people with a gross weight of no more than 30,000 pounds. The airport also serves approximately 10,000 total landings and departures of private aircraft per month. These consist mostly of aircraft that seat no more than 8 people, with an average gross weight of less than 12,500 pounds.

Although there are no specific air traffic restrictions over DCPP, most air traffic into and out of the San Luis Obispo Airport does not approach within 5 miles of the ISFSI site because of the mountainous terrain.

There is a federal flight corridor (V-27) that is used for aircraft flying between Santa Barbara and Big Sur areas, with 20 flights per day. The majority of the aircraft using this route is above 10,000 ft. Sometimes this corridor is used also for traffic into San Luis Obispo Airport and, in this case, has traffic that passes as close as 1 mile of the ISFSI site at an elevation of 3,000 ft. However, this portion of the route is normally only used for aircraft to align for instrument landing. The more commonly used approach route for visual landings passes 8 miles from the DC ISFSI site on the far side of the San Luis Range.

There is also a military training route (VR-249), which runs parallel to the site and its center is approximately 2 miles offshore. This training route is not frequently used. (Estimated at less then 50 flights per year). Its use requires a minimum of 5 miles visibility, and the flights are to maintain their altitude between 1,500 and a ceiling of 3,000 ft. Most aircraft using this route are military helicopters.

There is a municipal airport near Oceano, located 15 miles east-southeast of the DCPP site, which accommodates only small (12,500 pounds or less) private planes. The traffic at this airport is estimated to be no more than 2,200 flights per month. The Camp San Luis Obispo Airfield is located 8 miles northeast of the DCPP site, but is no longer operational.

2.7.2 ENVIRONMENTAL JUSTICE

Pursuant to Executive Order 12898 (Reference 2), this section describes the relationship between the socioeconomic characteristics of area residents and neighborhoods and the potential impacts and benefits of the project. Executive Order 12898 requires federal agencies to "make achieving environmental justice" part of its mission by identifying and addressing, as appropriate, disproportionately higher adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.

Impacts and benefits of ISFSI projects result from the siting, design, and management of such facilities, as compared with the effects of taking no action. This analysis examines whether ethnic minorities and low-income populations in the project area would experience these types of impacts, and if they are inconsistent with the benefits created.

As shown in Reference 1, the race ethnicity description for the County of San Luis Obispo shows 89.2 percent White, 2.6 percent Black, 2.9 percent Asian/Pacific Islander, 1.0 percent American Indian, and 4.3 percent Other. A subset of the white population is 13.3 percent Hispanic.

The ISFSI site is located in an isolated area. The nearest resident is approximately 1-1/2 miles north-northwest of the site and two people occupy the dwelling. There are 4 permanently inhabited dwellings, for about 14 residents, within 5 miles of the ISFSI site. The population within a 6-mile radius, used in the emergency plan at DCPP, is estimated to be 100. The residents within the 5-mile radius are 100 percent white.

No minority populations have been identified that are disproportionately high and would be adversely affected by the proposed ISFSI project.

As described in Reference 1, the San Luis County labor market shows an average family income for 2000 at $43,149. For 2001, the county unemployment rate was at 3.0 percent. The 2000 US Census Data reports the median household income in 2000 at $41,349, which is below the 2000 California median household income of $46,499.

The 5 miles surrounding the ISFSI site is an isolated undeveloped, nonpopulated, rural area containing hundreds of acres. According to the 1990 US Census, San Luis Obispo County, Census Tract 116 is the only census tract located within 5 miles of the ISFSI site. The percentage of households within Census Tract 116 with incomes below the poverty level is approximately 3.1 percent.

A localized determination has been made that no population within the 5 miles of the ISFSI site have disproportionately low incomes levels and disproportionately high poverty levels as compared with the County of San Luis Obispo.

2.7.3 REFERENCES

1. Community Economic Profile for the City of San Luis Obispo, California With Additional Information About San Luis Obispo County, March 2001.

2. Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations, Federal Register, p. 7629, February 16, 1994.

2.8 NOISE AND TRAFFIC

This section addresses the existing noise and traffic environment for the ISFSI vicinity. Noise impacts related to construction and operation of the ISFSI are addressed in Sections 4.1.7 and 4.2.7, respectively.

2.8.1 NOISE

Local noise ordinances stipulate sound level maxima at receptors outside of the ISFSI site. These sound levels are not assessed at the site except for CAL OSHA regulations associated with industrial health. The levels are regulated by local ordinances outside site boundaries at nearby communities.

2.8.1.1 Local Noise Policies

The Noise Element of the County of San Luis Obispo General Plan has established noise standards for residential and public institutional land uses. The maximum A-weighted decibel level (dBA) for stationary noise sources at a property line is 70 dBA during the daytime and 65 dBA during nighttime hours (10 p.m. to 7 a.m.), with hourly equivalent sound levels of 50 and 45 dBA, respectively. The contents of the Noise Element have been determined by the requirements of Section 65302(f) of the California Government Code and by the Guidelines for the Preparation and Content of the Noise Element of the County of San Luis Obispo General Plan prepared by the California Department of Health Services. The Guidelines require that major noise sources and areas containing noise-sensitive land uses be identified and quantified by preparing generalized noise exposure contours for current and projected conditions.

The Coastal Zone Land Use Ordinance, Title 23 of the San Luis Obispo County Code, Sections 23.06.040 through 23.05.062 - Noise Standards, establish exterior noise levels and how noise is to be measured. The Noise Standards in Section 23.06.042(h), are not applicable to work performed by private or public utilities in the maintenance or modification of its facilities.

2.8.1.2 Existing Noise Environment

2.8.1.2.1 Sound Measurement

Noise-sensitive receptors are those facilities or activities (that is, residential areas, hospitals, schools, performance spaces, offices) for which excessive noise may cause annoyance or loss of business (for example, commercial activities with heavy telephone use for which a quiet environment is required).

Measurements were taken at four locations around the ISFSI site (Figures 2.1-1 and 2.1-2): (a) at the raw water reservoir fence line on the southwest corner of the site, (b) on the corner of Reservoir and Tribar Roads, (c) at the northeast corner of the site under the 500-kV transmission tower at the west perimeter of the site, and (d) at the Avila Beach entrance gate. The measurements were taken on both weekend and weekday periods between August 5 and August 9, 1999. Acoustic measurements for determination of existing noise levels were taken for multiple 24-hour periods using Larson-Davis Models 700 and 820 and Metrosonic Model 604 noise dosimeters. Noise profiles at mid-octave ranges were obtained using a calibrated microphone and a B&K Model 2230 sound-level meter in conjunction with a Sony TCD-7 digital audio tape recorder. These measurements describe the ambient sound at 10 selective frequency ranges (octaves). Average noise measurements are shown in Table 2.8-1. Octave band analyses of existing noise are presented in Figures 2.8-1 and 2.8-2.

These measurements were necessary to aid in the estimation of noise propagation to the nearest receptors outside of the Diablo Canyon property line. Estimates of noise contributions from construction and operation of the ISFSI (addressed in Sections 4.1.7 and 4.2.7, respectively) were developed using standard rules of sound propagation as an inverse function of distance from the source of noise and the knowledge of the types and intensities of noise generators at the site.

The nearest receptors are residences. The majority of the receptors in the area around Diablo Canyon are located approximately 4 miles east and 10 miles south of the ISFSI site. The closest residence is located 1.5 miles from the ISFSI site.

2.8.1.2.2 Noise Survey Results

Table 2.8-1 summarizes the noise survey results in terms of average energy equivalent levels: L_{eq}; L_{10}; L_{50}; and L_{90}. Figure 2.8-3 is a graphic representation of the hourly L_{eq} values for the sound measurements taken on the perimeter of the ISFSI site. The L_{eq} is the equivalent noise level (average) over the given time and L_{10}, L_{50}, and L_{90} are statistical descriptors in which noise level is exceeded a given percentage of the time.

2.8.2 TRAFFIC

2.8.2.1 Roadway Network

The Diablo Canyon area is served by a network of roads, including an interstate freeway, a US highway, State highways, and local streets. As of August 1999, approximately 1,400 full-time personnel commuted into the Diablo Canyon area each day. Those employees traveled predominantly the highways serving the area. The following is a description of road facilities in the area (see Figure 2.1-1). During plant outages, the number of commuters to DCPP may increase 10 to 20 percent.

2.8.2.1.1 US Highway 101

US Highway 101 is a north-south highway and the main arterial road serving the coastal region in this part of California. It provides direct access to the Diablo Canyon area via Avila Beach Drive and San Luis Bay Drive, which are county roads. Highway 101 is a four-lane road in the area near the ISFSI. Access to the Highway in San Luis Obispo County is limited to interchanges. The posted speed limit is 65 mph.

2.8.2.1.2 State Highway 1

State Highway 1 is also a north-south highway but travels more closely to the coast than Highway 101. Highway 1 passes 10 miles to the north of the ISFSI site. It carries moderate traffic between San Luis Obispo and the coast. This highway in the area near the ISFSI is primarily a two-lane road between the communities of Morro Bay and San Luis Obispo. Although it does not have direct access to the ISFSI area, it provides a connection to Highway 101.

2.8.2.1.3 San Luis Bay Drive

San Luis Bay Drive is a county-maintained road between Highway 101 and Avila Beach Drive. San Luis Bay Drive is a two-lane road and serves as one of two main access roads to the community of Avila Beach.

2.8.2.1.4 Avila Beach Drive

Avila Beach Drive is also a county-maintained road. It is between Highway 101 and Port San Luis, and connects with San Luis Bay Drive. It is one of two main routes into Avila Beach, and it is the main access road to the entrance of the Diablo Canyon area.

2.8.2.1.5 Interstate Highway 5

Interstate Highway 5 is 85 miles away at its nearest point, but has an access to State Highway 101 via State Road 166 that begins approximately 25 miles south of Bakersfield and terminates at Santa Maria, approximately 25 miles from the ISFSI site.

2.8.2.2 Vehicular Traffic Patterns

Table 2.8-2 contains the traffic volume in two directions as measured by the California Department of Transportation in 1996 on the highways and roads serving the ISFSI site and vicinities. During summer weekends and plant outages, traffic volumes are higher than shown in the table.

Typically, traffic volume numbers are duplicated when inbound traffic counts are compared with outbound numbers.

2.8.2.3 Railroad Service

Union Pacific and Amtrak provide rail service to San Luis Obispo County by a route that roughly parallels US Highway 101. There is no spur track into the Diablo Canyon area. The nearest railroad access is located at Pismo Beach, 16 miles from the ISFSI.

2.8.2.4 Shipping

Coastal shipping lanes are approximately 20 miles offshore. Local tankers used to come into and out of Avila Beach and Estero Bay (within 5 to 10 miles of the site). However, all such local tanker traffic has been discontinued since 1994 at Estero Bay and since 1998 at Avila Beach.

2.9 REGIONAL HISTORIC, SCENIC, CULTURAL, AND NATURAL FEATURES

A cultural resources (historic and prehistoric archaeological, historic built environment, sites or areas of interest to local Native American community) investigation was conducted for the ISFSI project. This investigation consisted of the following steps:

- Archival Database search
- On-the-ground archaeological "field verification" of proposed impact areas
- Native American consultation

The results of the cultural resources investigation along with a description of scenic and natural resources are provided in this section.

2.9.1 ETHNOGRAPHIC OVERVIEW

The ISFSI is located in the ethnographic territory of the Obispeño, the northernmost group of the Chumash Indians of Southern California. The Obispeño language (Hokan language family) is considered the most divergent from other Chumash groups (Reference 1). The term Obispeño refers to the group associated with Mission San Luis Obispo and does not reflect the native term that the group used for themselves.

The Obispeño Chumash, although having a rich material culture, differed from other Southern Chumash groups. The plank canoe, a Southern Chumash trait, did not appear to be used or built this far north in Chumash territory (Reference 1). Mission record research suggests that the population in the north was also more mobile than in the south, as Mission San Luis Obispo recruitment was smaller than other missions (Reference 2). Population density also appears to be smaller with an estimated density of 25 to 45 individuals per square mile for the Obispeño (Reference 3). Explorers' accounts of northern Indian settlements substantiate the proposition that there was a different settlement pattern in the north than in the south. There appeared to be smaller more dispersed settlements in the north and larger aggregated settlements in the south.

The focus of Obispeño subsistence practices was based on maritime resources; the rocky and chaotic coastline may have precluded the use of the canoe. However, many mollusks and fish species present along the shoreline and the tidal pools were used. The Obispeño also used acorns, hard seeds, and terrestrial game. Trade relationships of the Obispeño were mainly to the north, with various items exchanged with the Southern San Joaquin Valley Yokuts and coastal Salinans.

The founding of the missions in Southern California had a devastating effect on Native Americans. With the founding of the Mission San Luis Obispo de Tolosa in 1772, Native Americans from the surrounding area were recruited to build, farm, and work on the Mission.

Poor living conditions and the introduction of Euro-American diseases led to the decimation of the native population. At Mission San Luis in 1803, just over 900 Native Americans were recorded as living there; in 1938, only 170 remained. In 1914 only one known Obispeño speaker was alive (Reference 1). Consequently, little has been preserved or recorded of Native American culture for the area. The establishment of the Santa Ynez reservation, 40 miles northeast of Santa Barbara, is the only land given to the Northern Chumash by the United States government.

2.9.2 HISTORIC OVERVIEW

The ISFSI is part of the Cañada de Los Osos y Pecho y Islay Mexican land grant patented to John Wilson in 1869 by the United States government. The area was once two separate land grants, the Cañada de Los Osos and the Pecho y Islay. The Cañada de Los Osos was granted to Victor Linares in December of 1842 by Governor Alvarado (References 4 and 5). The area was also granted to Modesta Castro in 1844 but her claim was rejected (Reference 4). Governor Michelorena granted Pecho y Islay to Francisco Padilla in April of 1843.

In 1845, captains James Scott and John Wilson became the grantees of the combined Ranchos, Cañada de Los Osos y Islay, which included 32,430 acres. These two men also purchased the San Luis Obispo Mission (Reference 6). The land was patented by the United States government to John Wilson in September of 1869. Wilson later married the widow of Don Romualdo Pacheco, whose son of the same name became governor of California in 1876. In 1851, Wilson is reported to have had land holdings in excess of 53,000 acres (Reference 7). Portions of the land grant were subsequently obtained by W. H. Patterson, H.M. Warden, Ramona Hilliard, and L. Marre (Reference 7).

The land to the north of Diablo Creek was then owned by the Spooner family from 1892 until 1942, and after that by Oscar Field (Reference 2). The land to the south of Diablo Creek was leased and/or owned by the Marre family since 1879 until recently. Luigi Marre leased the Pecho holdings beginning in 1879; he later bought the land (Reference 2). Luigi Marre leased the Pecho holdings beginning in 1879; he later bought this land (Reference 2). The area, which remained isolated for years, has been used primarily for cattle grazing and agricultural purposes.

2.9.3 ARCHEOLOGICAL OVERVIEW

During the Mid-19th century, a number of collectors excavated sites along the coastline from Morro Bay to Avila Beach. In 1872, one collector, Charles H. Jackson, reported on the finding of a cemetery near San Luis Obispo Bay (Reference 7). Other early "excavations" along the coastline near the Project area include Leon de Cessac in 1878, Summers and Freer in 1894-95, and the Los Angeles County Museum in 1929 (Reference 2). On an 1874 map prepared by Schumacher for the Smithsonian Institute, the Terrace area to the north of Avila

Beach is marked as the location of "Indian kitchen middens," although specific locales were not noted.

Over a period of some 30 years there have been a number of cultural resource investigations at prehistoric archeological sites located in the ISFSI area. The first study to record sites in the area was that of Arnold R. Piling in 1955 (Reference 8). His survey, which was focused along the Marine terraces from Avila Beach to Morro Bay, recorded sites CA-SL0-2 (SLO-2) and SL0-3 in 1947 and SLO-61 in 1948 at the mouth of Diablo Creek. In addition he noted two other sites, SL0-7 and SL0-8, located northwest of Diablo Creek.

In 1966, Francis Riddell conducted a survey for PG&E of approximately 250 acres to be used as the site for DCPP. This reconnaissance (Reference 9) resulted in the description of five sites located within the ISFSI area. These are known as Riddell Nos. 1, 2, 3, 4, and 5. Very little descriptive information concerning the sites, area surveyed, and method of survey is contained in Riddell's report. Although it is not stated in the report, SL0-2 is the same as Riddell's No. 1 and SL0-61 is Riddell's No. 2. Thus, as a result of Riddell's survey, two previously recorded sites were relocated and three new sites (Riddell Nos. 3, 4, and 5) were recorded. One of the new sites, Riddell No. 4 was assigned the designation CA-SL0-584 in 1966.

In 1968, Greenwood and associates undertook subsurface investigations at six sites within the construction areas for the DCPP facilities and a proposed access road from the plant locale to Avila Beach. The excavations in the area included SL0-2, SL0-61, and SL0-584. Further, Greenwood (Reference 2) conducted minimal work at Riddell No. 3. In addition, the report contains a summary of ethnographic research concerning the immediate ISFSI area (Reference 2) and an analysis of fish remains from SL0-2 (Reference 10). Excavation appears to been restricted to the direct impact areas of the form of proposed facilities or remaining portions of the sites which had not been disturbed by grading or construction activities.

The subsurface excavation of thirty-two 1 x 2 meter units resulted in the inspection of about 190 cubic meters of soil from SL0-2 at two different locations (Reference 2). Thirty units were excavated at CA-SL0-2, site one, revealing a midden soil that ranged in depth from 260 to 340 cm. Two other units placed in an area northeast of Site 1, designated Site 1a, had a cultural deposit ranging in depth from 70 to100 cm. This latter area was also the location of SL0-3. Based on this investigation, Greenwood suggests that sites SL0-2 and SL0-3 should be considered as one site. Subsequent investigations have validated this proposition.

The excavations at SL0-2 resulted in the exposure of a cemetery complex containing 54 inhumations, 24 that were identified as female, and 15 male (Reference 2). Due to grading for road construction, an additional six inhumations were recovered from the site in November of 1968 and six fragmentary inhumations collected in June 1969. A total of 66 burials were exposed. Grave goods were associated with some of the burials. The burials recovered from

these excavations were turned over to a local Native American group and were reported to have been reburied.

The artifact inventory from the site is quite impressive. A total of 2,885 stone, bone, wood, and shell artifacts comprise the catalog material from the site. This includes stone projectile points, blades, knives, shoppers, scrapers, boring or drilling implements, and cores. Groundstone items include bowls, bull borders, manos, milling stones, pestles, pitted stones, and charmstones. A number of mammal, shell, and bird bone artifacts were recovered in addition to 1,607 shell beads. The be inventory also includes Olivella, Mytilus, and clam beads. A few sherds of pottery, similar to Owens Valley brown where were also collected. A large quantity of faunal material was also recovered.

Temporal affiliations ascribed to the materials recovered from CA-SL0-2 cover a time span of some 9,000 years. Based on results of three radiocarbon dates, 930 ± 50 (UCLA 1686B: human bone from burial 44), 8960 ± 190 (GAK-2044: Haliotis shell adjacent to burial 5), 9320 ± 140 (UCLA-1686A: human bone from burial 20 [dates expressed in years before present]), a suite of 23 hydration rim readings from 21 samples, and cross- dating of artifact types, Greenwood (1972: 85-95) postulated three temporal components at the site. These are, from earliest to latest periods, the Early Milling Stone, Hunting, and Canaliño horizons specifically related to the Diablo Canyon area (Reference 2). Greenwood was also able to identify assemblages and present evidence for different settlement/subsistence patterns for each period. It was suggested that SL0-2 was a major village that figured prominently in the social, economic, and political life of the indigenous occupants of the area. The 1968 excavations of the site resulted in the identification one of the oldest cultural list ratified sites identified to date in San Luis Obispo County.

Excavations were also undertaken at CA-SLO-61 along the bluff overlooking the Diablo Coast. Five 1 x 2 meter excavation units were completed at the site. Six cubic meters of soil were examined and resulted in the recovery of 40 artifacts that included a bowl mortar, pitted stones, a cobble pestle, a drill, and 21 scrapers. The cultural deposit ranged in depth from 20 to 100 cm. Based on a comparison of materials recovered from the limited excavation to those recovered from the upper levels SL0-2, Greenwood (Reference 2) assigned the site to the Canaliño.

Another site within the ISFSI area, but not located on the coast (SL0-584), was also excavated by Greenwood (Reference 2). The site was located on a small flat on the South Bank of Diablo Creek. It is now the site of the DCPP switchyard. Seven units were excavated at the site that ranged in depth from 50 to 100 cm. A total of 76 catalog artifacts were recovered from the site. Materials collected included 10 projectile points, leaf-shaped blades, scrapers, three bowl fragments, a hopper mortar fragment, a pestle, pitted cobbles, brownware sherds, Olivella disks, and Mytilus and Tivela beads. Historic materials included five glass trade beads and one brass ring. In addition, three cupule boulders were located within the site boundaries. Based on cross-dating of artifact types similar to the upper levels of SL0-2 and

the occurrence of historic period artifacts, the site is considered to be a late (Canaliño) site. It is also suggested that it was a task-specific site with a short-term for seasonal occupation (Reference 2).

The last site within the ISFSI area examined during the 1968-69 investigations was Riddell Site 3. The site is located at the southern tip of Diablo Coast. Greenwood (Reference 2) provides the following description of the work completed at the site:

> "It should be noted that one additional locale was described in the contract agreement but not excavated during the fieldwork described in this report. A light scatter of shell which appeared fresh and recent was on the surface of 1968, but test pits test dug by shovel disclosed only very shallow soil covering on the volcanic outcrop and no shell, chipping waste, or artifacts below the surface. In view of the total priorities, no systematic excavation was attempted."

In September of 1974, Greenwood removed human remains in the area around two potholes and reported upon natural erosion occurring along the coastline strip of the site (Reference 11). She further recommended some measures for controlling vandalism at the site and midden sluffing along the bluff area.

In 1978, Greenwood and Associates completed the survey of 90 acres of land thought to be the aerial extent of site SL0-2. She concludes:

> "Based on visible indications, the extent of the site is revealed as a minimum of 350 meters east-west by a minimum of 427 meters north-south, for a known area of 130,235 square meters...that the locality recorded by Pilling as SL0-3 is actually within the boundaries of SL0-2, and a part of the larger site."

Also contain within this report was information regarding the nomination of SL0-2 to the National Register of Historic Places as part of the existing Rancho Canada de Los Osos y Pechos Historic District, located some 1.4 miles to the south of the ISFSI area (Reference 1). Another document prepared by Greenwood and Associates (1978) that supplemented the survey report, addressed background research regarding Diablo Canyon and SLO-2 (Reference 12). The main purpose of this research was to investigate the reported location of the Chumash village location Tsuhanu that was asserted to be within the DCPP site. It was determined, based on a record search and interviews, that SL0-2 was not the location of this village.

Since the 1968 investigations, PG&E has instigated various procedures for the protection and management of SL0-2. In 1980, an Archeological Resources Management Plan (ARMP) was incorporated into the operating license for DCPP (Reference 13). Surface alterations addressed in this management plan include provisions for fire protection, storage of materials confined to areas protected by fill, restrictions on traffic flow, and limiting maintenance of

roads and existing utility lines to areas have been previously disturbed. The site area has been fenced and warning signs are posted at entry points of road access to the site. Since November of 1983, photographs have been taken at regular intervals from 23 stations within the site in order to monitor any physical changes to the site caused by natural or other processes.

In 1986, Holson reported on the survey of the unsurveyed portions the NRC license regulated area for DCPP (Reference 13). A total of six prehistoric sites were reported. Three new sites, SLO-1161, SLO-1162, and SLO-1163, two of Riddell's sites, SLO-1159 (Riddell 3) and SLO-1160 (Riddell 5), and a new site form were prepared for SLO-61.

From 1979 to the present, other archeological investigations conducted within the ISFSI area have been associated with ongoing maintenance and construction of facilities for DCPP. In general, the majority of the work has focused on monitoring surface modifications in the area of SLO-2.

2.9.4 ARCHIVAL DATABASE SEARCH

A cultural resource record database search was conducted at PG&E's cultural resource library in San Francisco. The research was performed to identify previously recorded or otherwise known cultural resources and previous cultural resource studies within or adjacent to the proposed ISFSI, and archaeologically sensitive portions of the study area, as determined by the locations of previously recorded archaeological sites nearby and their relationship to environmental factors and topography. As the project area is an area controlled by PG&E for the past 30 plus years, a record search of the California Historic Resource Information System at U.C. Santa Barbara was not deemed necessary.

The database search revealed that the project area (areas of direct and indirect impacts including construction and operation of the ISFSI) had been previously examined (Reference 13). No sites listed in or eligible for inclusion in the National Register of Historic Places (NRHP) were identified within the area of the proposed ISFSI. One archaeological site that is listed in the NRHP (CA-SLO-2) is located within 150 meters of the proposed ISFSI site. Seven other sites (CA-SLO-61, -584, -1159, -1160, -1161, -1162, and –1163) are located within the 750-acre exclusion zone surrounding DCPP. Several other prehistoric and historic archaeological sites are located within the coastal terrace between Diablo Creek to the south and Coon Creek to the north. Over 70 prehistoric archaeological sites are located south of Diablo Creek, including a large NRHP District.

A record search for significant natural features that are listed in the National Registry of Natural Landmarks was conducted by contacting the National Park Service Land Management Division in San Francisco. This research indicated that no natural landmarks are located near the ISFSI.

Early low-level aerial photos of DCPP were also examined. The purpose of this review was to verify areas of previous disturbance in the ISFSI site area. The aerial photos clearly revealed that the ISFSI site has been disturbed during construction of the switchyards. The entire ISFSI site was cut for the fill to provide switchyards.

2.9.5 FIELD VERIFICATION

An on-the-ground field survey of the area near the ISFSI was conducted in May and September 2000 and January 2001. The primary focus of this field study was to verify the previous ground disturbance to the ISFSI site and the absence of any archaeological sites as reported in Reference 13. These field verifications determined that the ISFSI site has had major soil removal and no archaeological sites were noted. Other project components are located on landfill; no archaeological sites were noted in the fill.

2.9.6 NATIVE AMERICAN CONSULTATION

Four local Native American individuals of Chumash descent and the federally recognized Santa Ynez Band of Chumash were contacted by letter on April 13, 2000. The letter requested concerns and comments from the local Native American community and extended a meeting invitation to discuss the proposed ISFSI. A meeting was eventually held with one individual and another individual responded by mail.

The concerns expressed by the two Chumash individuals ranged from general concern for activities at Diablo Canyon to more specific concerns on potential harm to the environment from the ISFSI. While the individual who responded by letter noted no specific concerns, the area is of great spiritual importance to that individual.

On August 17, 2000, a second letter was sent to the Santa Ynez Band of Chumash. The letter was sent to the Tribal Elders, the Tribal subgroup that is responsible for commenting on proposed projects. No comments have been received to date in response to this letter.

2.9.7 SCENIC AND NATURAL RESOURCES

The proposed ISFSI is situated along a 12-mile stretch of California coast located between Montana de Oro State Park to the north and Avila Bay to the south. This stretch of coast is characterized by a relatively narrow and flat coastal plain or marine terrace that abuts the base of the Irish Hills. The seaward cliff edge of the marine terrace is typically rugged and rocky. Numerous offshore stacks, rock-lined coves, extensive tide pools, and near shore rocky crevices are prominent features of this landscape. Lion Rock, Diablo Rock, Pecho Rock and the Point San Luis Lighthouse are prominent scenic resources along this stretch of coast. Other than the DCPP development, the area has only a few rural structures associated with cattle grazing and farming and a 12-kV distribution line that parallels a farm road to the north of Diablo Creek.

2.9.8 REFERENCES

1. Roberta Greenwood, Surface Survey and Evaluation, SLO-2 at Diablo Canyon, prepared for PG&E, 1978.

2. Roberta Greenwood, 9000 Years of Prehistory at Diablo Canyon, San Luis Obispo County, California, San Luis Obispo County Archaeological Society, Occasional Paper No. 7, 1972.

3. Robert F. Heizer, ed., "Obispeño and Purisimeño Chumash," Handbook of North American Indians, Volume 8: California, Smithsonian Institution, 1978.

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6. Helen Ballarp, "San Luis Obispo County in Spanish and Mexican Times," Quarterly of the California Historical Society, Volume 1, No. 2: 152-172, California Historical Society, 1922.

7. Thomas A. Thompson and Albert A. West, History of San Luis Obispo County, California, Facsim Edition, Berkeley, 1966.

8. Arnold R. Piling, "Surface Archaeology of the Pecho Coast," The Masterkey, Volume 25, No. 6: 196-200, Los Angeles, 1951.

9. Frances A. Riddell, An Archaeological Reconnaissance of the Diablo Creek Vicinity, San Luis Obispo County, California, prepared for PG&E, 1966.

10. John E. Fitch, Fish Remains Primarily Otoliths, from Coastal Indian Midden (SLO-2) at Diablo Cove, San Luis Obispo County, California, San Luis Obispo County Archaeological Society Occasional Papers, 7:101-120, 1972.

11. Robert Greenwood, Archaeological Status of SLO-2, Diablo Canyon Nuclear Power Generating Plant, San Francisco, 1974.

12. Roberta Greenwood, Background Research Regarding Diablo Canyon and SLO-2, prepared for PG&E, 1978.

13. John Holson, Archaeological Resources Located on Parcel P, Diablo Canyon, San Luis Obispo County, California, prepared for PG&E, 1986.

2.10 BACKGROUND RADIOLOGICAL CHARACTERISTICS

2.10.1 GENERAL INFORMATION

The DCPP site has been extensively monitored for its radiological characteristics for nearly 30 years as part of the preoperational and operational Radiological Environmental Monitoring Program (REMP). The results of the REMP for DCPP are reported annually in an Annual Radiological Environmental Operating Report (AREOR) (Reference 1). In the remainder of this section, data from the 1998 AREOR are summarized to provide an overview of the radiological characteristics of the ISFSI site. In addition to the results from the REMP, several supplemental samples were collected from the vicinity of the ISFSI site and analyzed for their radiological content. These supplemental samples were two vegetation (grass) samples and three soil samples.

Information on the conduct of the REMP and more discussion of the results obtained may be found in the AREORs.

With the exception of the supplemental samples taken in the vicinity of the ISFSI, the distances and directions from the power plant to the onsite environmental monitoring stations referred in this section are listed in Table 2.10-1. The locations of these stations in relation to the ISFSI site are shown in Figure 2.10-1. Several dosimetry stations and air sampling locations discussed below and shown on the tables are not located on the immediate plant site and are not shown in Figure 2.10-1. The ISFSI is located approximately 0.22 miles northeast of the Unit 1 containment.

2.10.2 DIRECT RADIATION

The ambient direct radiation levels in the vicinity of the ISFSI are routinely measured for the REMP using thermoluminescent dosimeters (TLD) located at fourteen dosimetry stations. The average quarterly exposure rate during 1998 at these stations was 17.8 mrem/qtr or 71.2 mrem/yr, as shown in Table 2.10-2.

2.10.3 CORE AND SOIL SAMPLES

Since the ISFSI site, in some areas, will be excavated, core samples were taken from the vicinity of the ISFSI site at three different locations. Soil samples were taken from these cores in May 1998 at the depth that would reflect the final grade of the ISFSI at those locations; 15 ft, 29 ft, and 57 ft below the current grade. Gamma spectrometry analysis performed on these samples detected only naturally occurring radionuclides, as shown in Table 2.10-3.

2.10.4 GRASS SAMPLES

Since broad leaf vegetation does not normally grow at the ISFSI site and no vegetation samples are collected from the ISFSI site in the REMP, two grass samples were collected on June 17, 1999, from the vicinity of the ISFSI site. Gamma spectrometry analysis performed on these samples showed only naturally occurring radionuclides, as shown in Table 2.10-4.

2.10.5 SURFACE AND DRINKING WATER SAMPLES

Surface and drinking water samples were collected monthly for the REMP. Surface water samples were collected at Diablo Cove (station DCM), Rattlesnake Canyon (station 7C2), and at the plant outfall (station OUT). Drinking water samples were collected from Diablo Creek Weir (Station 5S2) and from the drinking water system (Station DW1) at the plant. Gamma spectrometry and tritium analyses were performed on these water samples. Only naturally occurring radionuclides were found in these samples with the exception of four surface water samples collected from DCM. One sample contained 1.79 pCi/liter of Cobalt-60, and three surface water samples contained an average concentration of 3.27×10^3 pCi/liter (based on detectable measurements only) of tritium.

2.10.6 AIR SAMPLES

Air samples (iodine cartridges and air particulate filters) were collected weekly for the REMP from four stations (Stations MT1, 0S2, 1S1 and 8S1) in the vicinity of the ISFSI; and also from two stations along the access road (Stations 8S2 at the secondary met tower and 7D1 on the side of the hill west of Avila Gate). Since Stations 8S2 and 7D1 are not on the immediate plant site, they are not shown in Figure 2.10-1. Gamma spectrometry and gross beta analyses were performed on these samples. Radioiodine was not detected in any of these samples. The average gross beta concentrations on the particulate filters collected from these stations are provided in Table 2.10-5.

2.10.7 MARINE SAMPLES

Marine samples (mussels, algae, sediment, and fish) were collected from Diablo Cove (station DCM) for the REMP. In 1998, one out of the eight mussel samples collected contained 5.69×10^1 pCi/kg of Cobalt-58. Two out of the ten algae samples collected contained Cobalt-58 with an average concentration of 1.04×10^2 pCi/kg. An annual sediment sample collected from Diablo Cove contained 1.34×10^1 pCi/kg of Cobalt-60. The presence of radiocobalt in these marine samples was attributed to the operations of the plant. Also, one out of the eight fish samples collected contained 8.14 pCi/kg of Cesium-137. The presence of Cesium-137 was attributed to global fallout from atmospheric nuclear weapon testing prior to plant operation. The detected concentrations of these radionuclides were well below the NRC reportable limits for the REMP.

2.10.8 REFERENCES

1. 1998 Annual Radiological Environmental Operating Report, PG&E, April 30, 1999.

TABLE 2.2-1

POPULATION TRENDS OF THE STATE OF CALIFORNIA
AND OF SAN LUIS OBISPO AND SANTA BARBARA COUNTIES

Year	State of California	San Luis Obispo County	Santa Barbara County	Notes
1940	6,907,387	33,246	70,555	(a)
1950	10,586,233	51,417	98,220	(a)
1960	15,717,204	81,044	168,962	(a)
1970	19,953,134	105,690	264,324	(a)
1980	23,668,562	155,345	298,660	(a)
1990	29,760,021	217,162	369,608	(a)
2000	33,871,648	246,681	399,347	(a)
2005	40,262,400	323,100	467,700	(b)
2025	48,626,052	426,812	603,966	(c)

Notes: (a) U.S. Bureau of the Census
(b) State of California Department of Finance (June 2001)
(c) State of California Department of Finance Data Files (March 16, 2000)

TABLE 2.2-2

GROWTH OF PRINCIPAL COMMUNITIES WITHIN
50 MILES OF ISFSI SITE

Community	Population (1960 Census)	Population (1970 Census)	Population (1980 Census)	Population (1990 Census)	Population (2000 Census)
Arroyo Grande	3,291	7,454	10,350	21,992	15,851
Atascadero	5,983	10,290	15,930	22,720	26,411
Grover Beach	5,210	5,939	8,827	11,790	13.067
Guadalupe	2,614	3,145	3,629	6,464	5,659
Lompoc	14,415	25,284	26,267	49,960	41,103
Morro Bay	3,692	7,109	9,064	10,457	10,350
Paso Robles	6,617	7,168	9,163	29,255	24,297
Pismo/Shell Beach	1,762	4,043	5,364	7,474	8,551
San Luis Obispo	20,437	28,036	34,253	56,614	44,174
Santa Maria	20,027	32,749	39,685	60,187	77,423

TABLE 2.2-3

POPULATION CENTERS OF 1,000 OR MORE
WITHIN 50 MILES OF DCPP SITE

Community	County	Distance and Direction From the Site	Population (1970 Census)	Population (1980 Census)	Population (1990 Census)	Population (2000 Census)
Baywood-Los Osos	San Luis Obispo	8 miles N	3,487	10,933	15,290	14,351
Morro Bay	San Luis Obispo	10 miles N	7,109	9,064	12,949	10,350
San Luis Obispo	San Luis Obispo	12 miles ENE	28,036	34,253	51,173	44,174
Pismo Beach	San Luis Obispo	13 miles ESE	4,043	5,364	7,699	8,551
Grover City	San Luis Obispo	14 miles ESE	5,939	8,827	11,656	13,067
Oceano	San Luis Obispo	15 miles ESE	2,564	4,478	6,169	7,260
Arroyo Grande	San Luis Obispo	17 miles ESE	7,454	10,350	14,378	15,851
Cayucos	San Luis Obispo	17 miles N	1,772	2,301	2,960	2,943
Atascadero	San Luis Obispo	21 miles NNE	10,290	15,930	23,138	26,411
Guadalupe	Santa Barbara	23 miles SE	3,145	3,629	5,479	5,659
Nipomo	San Luis Obispo	24 miles ESE	3,642	5,247	7,109	12,626
Cambria	San Luis Obispo	28 miles NNW	1,716	3,061	5,382	6,232
Santa Maria	Santa Barbara	29 miles SE	32,749	39,685	61,284	77,423
Paso Robles	San Luis Obispo	30 miles NNE	7,168	9,163	18,583	24,297
Orcutt	Santa Barbara	33 miles SE	8,500	1,469	----	28,830
Vandenberg	Santa Barbara	35 miles SSE	13,193	13,975	----	11,953
Lompoc	Santa Barbara	45 miles SSE	25,284	26,267	37,649	41,103
		Total	180,793	203,996	280,898	351,081

TABLE 2.2-4

AGE AND SEX OF TOTAL POPULATION: 2000
SAN LUIS OBISPO COUNTY, CALIFORNIA

Age	Number			Percent		
	Both sexes	Male	Female	Both sexes	Male	Female
Total Population	246,681	126,704	119,977	100.0	100.0	100.0
Under 5 years	12,358	6,293	6,065	5.0	5.0	5.1
5 to 9 years	14,912	7,662	7,250	6.0	6.0	6.0
10 to 14 years	16,174	8,416	7,758	6.6	6.6	6.5
15 to 17 years	9,969	5,253	4,716	4.0	4.1	3.9
18 to 19 years	10,924	5,970	4,954	4.4	4.7	4.1
20 to 24 years	22,647	12,918	9,729	9.2	10.2	8.1
25 to 34 years	28,177	15,736	12,441	11.4	12.4	10.4
35 to 44 years	38,416	20,134	18,282	15.6	15.9	15.2
45 to 54 years	36,150	18,515	17,635	14.7	14.6	14.7
55 to 59 years	11,787	5,806	5,981	4.8	4.6	5.0
60 to 64 years	9,482	4,563	4,919	3.8	3.6	4.1
65 to 74 years	18,094	8,364	9,730	7.3	6.6	8.1
75 to 84 years	13,415	5,719	7,696	5.4	4.5	6.4
85 years and over	4,176	1,355	2,821	1.7	1.1	2.4
Under 17 years	53,413	27,624	25,789	21.7	21.8	21.5
18 to 64 years	157,583	83,642	73,941	63.9	66.0	61.6
65 years and over	35,685	15,438	20,247	14.5	12.2	16.9

Source: US Census Bureau, 2000 Census of Population and Housing, Summary File 1. Produced by the California State Census Data Center.

TABLE 2.2-5

TRANSIENT POPULATION AT RECREATION AREAS
WITHIN 50 MILES OF ISFSI SITE

Name	Visitor Days
State Parks [a]	
Cayucos State Beach	698,000
Hearst San Simeon State Historical Monument	795,000
Montana de Oro State Park	683,000
Morro Bay State Park	1,129,000
Morro Strand State Beach	129,000
Pismo State Beach	1,297,000
San Simeon State Park	696,000
W. R. Hearst Memorial State Beach	213,000
County and Local Parks [b]	
Lake Nacimiento	345,000
San Antonio Reservoir	361,000
Avila Beach	800,000
Cambria	15,000
Cayucos Beach	918,000
Cuesta	67,000
Lopez Recreation Area	379,000
Nipomo	168,000
Oceano	95,000
San Miguel	54,000
Santa Margarita Lake	169,000
Shamel	130,000
Templeton	99,000
Los Alamos Park	45,000
Miguelito Park	36,000
Ocean Park	105,000
Rancho Guadalupe Dunes Park	48,000
Waller	450,000
Atascadero Lake	300,000

Name	Visitor Days
Los Padres National Forest [c]	
Agua Escondido	700
American Canyon	800
Balm of Gilead	200
Brookshire Springs	1,600
Buckeye	200
Cerro Alto	15,600
French	200
Frus	700
Hi Mountain	4,800
Horseshoe Springs	1,400
Indians	600
Kerry Canyon	300
La Panza	4,400
Lazy Camp	500
Miranda Pine	2,300
Navajo	2,800
Pine Flat	300
Pine Springs	400
Plowshare Springs	300
Queen Bee	2,200
Stony Creek	1,100
Sulphur Pot	1,000
Upper Lopez	600
Wagon Flat	2,200

(a) California Department of Parks and Recreation (July 1998 through June 1999).
(b) County Park Departments.
Monterey and Santa Barbara Counties (July 1999 through June 2000).
San Luis Obispo County (July 1998 through June 1999).
(c) Los Padres National Forest (July 1971 through June 1972. Current data is no longer compiled).

TABLE 2.3-1

VASCULAR PLANTS IDENTIFIED ON DIABLO CANYON LANDS

RUDERAL AND DEVELOPED AREAS

Conifers
CUPRESSACEAE
Cupressus sp.

Flowering Plants-Dicots
APIACEAE
Conium maculatum
Foeniculum vulgare

ASTERACEAE
Agoseris grandiflora
Anthemis cotula
Artemisia douglasiana
Brickellia californica
Carduus pycnocephalus
Centaurea melitensis
Chamomilla suaveolens
Cirsium vulgare
Gnaphalium purpureum
Gnaphalium stramineum
Heterotheca grandiflora
Hypochoeris glabra
Logfia gallica
Madia gracilis
Madia sativa
Psilocarphus tenellus var. *tenellus*
Silybum marianum
Soliva sessilis
Sonchus asper
Sonchus oleraceus
Xanthium spinosum

BETULACEAE
Betula sp.

BRASSICACEAE
Brassica rapa
Capsella bursa-pastoris
Hirschfeldia geniculata
Lepidium nitidum
Lepidium oblongum
Raphanus sativus

CARYOPHYLLACEAE
Cerastium glomeratum
Minuartia douglasii
Silene gallica
Spergularia marina
Spergularia rubra
Spergularia villosa
Stellaria media

CHENOPODIACEAE
Atriplex lentiformis ssp. *lentiformis*
Chenopodium murale

CONVOLVULACEAE
Calystegia macrostegia ssp. *cyclostegia*
Convolvulus arvensis

EUPHORBIACEAE
Euphorbia lathyris
Euphorbia spathulata

FABACEAE
Genista monspessulanus
Lotus junceus
Lupinus hirsutissimus
Lupinus succulentus
Melilotus indica
Trifolium fragiferum
Trifolium hirtum
Trifolium incarnatum

GERANIACEAE
Erodium cicutarium
Geranium dissectum
Geranium molle

HYDROPHYLLACEAE
Phacelia parryi

LAMIACEAE
Marrubium vulgare

LINACEAE
Linum lewisii

LYTHRACEAE
Lythrum hyssopifolia

MALVACEAE
Malva neglecta
Malva nicaeensis

OXALIDACEAE
Oxalis pes-caprae

PAPAVERACEAE
Eschscholtzia californica
Papaver rhoeas

PLANTAGINACEAE
Plantago coronopus
Plantago lanceolata

POLEMONIACEAE
Navarretia squarrosa

POLYGONACEAE
Chorizanthe palmeri
Chorizanthe staticoides
Rumex obtusifolius
Rumex crispus

PORTULACACEAE
Claytonia perfoliata ssp. *perfoliata*

PRIMULACEAE
Anagallis arvensis

SOLANACEAE
Nicotiana glauca

URTICACEAE
Urtica urens

Monocots
JUNCACEAE
Juncus bufonius var. *bufonius*
Juncus patens

POACEAE
Aira caryophyllea
Avena fatua
Avena sativa
Brachypodium distachyon
Bromus diandrus
Bromus hordeaceus
Bromus madritensis ssp. *rubens*
Cynodon dactylon
Dactylis glomerata
Festuca pratensis
Hordeum marinum ssp. *gussoneanum*
Hordeum marinum ssp. *leporinum*
Lamarckia aurea
Lolium multiflorum
Pennisetum clandestinum
Phalaris aquatica
Phalaris minor
Poa annua
Vulpia microstachys var. *pauciflora*
Vulpia octoflora var. *hirtella*

BISHOP PINE FOREST

Ferns and Fern Allies
DENNSTAEDTIACEAE
Pteridium aquilinum var. *pubescens*

DRYOPTERIDACEAE
Polystichum imbricans ssp. *curtum*

Conifers
Pius muricata

Flowering Plant Dicots
ANACARDIACEAE
Toxicodendron diversilobum

ASTERACEAE
Cirsium brevistylum
Sonchus oleraceus

BORAGINACEAE
Cryptantha clevelandii

BRASSICACEAE
Cardamine californica var. *integrifolia*

CAPRIFOLIACEAE
Lonicera hispidula vacilans

CARYOPHYLLACEAE
Silene laciniata ssp. *major*

ERICACEAE
Arbutus menziesii
Arctostaphylos cruzensis
Arctostaphylos pechoensis
Arctostaphylos tomentosa ssp. *crinita*
Gaultheria shallon
Vaccinium ovatum

FABACEAE
Lathyrus vestitus
Lupinus cervinus
Lupinus concinnus
Vicia americana

FAGACEAE
Castanopsis chrysophylla
Lithocarpus densiflora var. *densiflora*
Quercus agrifolia

Quercus chrysolepis

PRIMULACEAE
Trientalis latifolia

RHAMNACEAE
Ceanothus cuneatus var. *fascicularis*
Ceanothus papillosus var. *roweanus*

ROSACEAE
Rosa gymnocarpa
Rubus ursinus

RUBIACEAE
Galium californicum ssp. *flaccidum*

SCROPHULARIACEAE
Castilleja foliolosa

URTICACEAE
Hesperocnide tenella

Monocots
CYPERACEAE
Carex globosa

POACEAE
Agrostis exarata
Agrostis hooveri
Agrostis pallens

COASTAL BLUFF SCRUB

Ferns and Fern Allies
POLYPODIACEAE
Polypodium californicum var. *californicum*

Flowering Plants-Dicots
AIZOACEAE
Carpobrotus edulis

ANACARDIACEAE
Toxicodendron diversilobum

APIACEAE
Foeniculum vulgare

ASTERACEAE
Ambrosia chamissonis
Artemisia californica
Baccharis pilularis
Erigeron glaucus
Eriophyllum confertiflorum var. *confertiflorum*
Eriophyllum staechadifolium
Hazardia squarrosa var. *squarrosa*
Lasthenia californica
Lasthenia maritima
Solidago spathulata

BORAGINACEAE
Amsinckia spectabilis

CARYOPHYLLACEAE
Spergularia macrotheca
Spergularia marina

CHENOPODIACEAE
Atriplex coulteri
Atriplex leucophylla

CRASSULACEAE
Dudleya lanceolata

ERICACEAE
Gaultheria shallon

EUPHORBIACEAE
Eremocarpus setigerus

FABACEAE
Astragalus nuttallii var. *nuttallii*
Lupinus chamissonis

PLANTAGINACEAE
Plantago coronopus
Plantago erecta

POLYGONACEAE
Eriogonum parvifolium
PORTULACACEAE
Claytonia perfoliata ssp. *mexicana*

Monocots
IRIDACEAE
Sisyrinchium bellum

LILIACEAE
Fritillaria biflora

POACEAE
Distichlis spicata
Hordeum marinum ssp. *leporinum*

NORTHERN MIXED AND MARITIME CHAPARRAL

Conifers
PINACEAE
Pinus muricata

Flowering Plants-Dicots
ANACARDIACEAE
Toxicodendron diversilobum

ASTERACEAE
Cirsium vulgare
Logfia gallica
Sonchus asper
Stylocline gnaphalioides

BRASSICACEAE
Lepidium nitidum
Thysanocarpus laciniatus

CARYOPHYLLACEAE
Minuartia douglasii
Silene antirrhina
Silene gallica

CISTACEAE
Helianthemum scoparium

CRASSULACEAE
Dudleya lanceolata

ERICACEAE
Arctostaphylos cruzensis
Arctostaphylos pechoensis
Arctostaphylos wellsii
Arctostaphylos tomentosa ssp. *crinita*
Vaccinium ovatum

FABACEAE
Lotus junceus
Lotus scoparius var. *scoparius*
Lotus strigosus
Lupinus albifrons var. *albifrons*
Lupinus nanus
Pickeringia montana

FAGACEAE
Quercus agrifolia

GROSSULARIACEAE
Ribes malvaceum var. *viridifolium*

HYDROPHYLLACEAE
Phacelia rattanii

ONAGRACEAE
Camissonia micrantha

PAPAVERACEAE
Dendromecon rigida

POLEMONIACEAE
Navarretia hamata ssp. *parviloba*

POLYGONACEAE
Chorizanthe palmeri
Chorizanthe staticoides
Eriogonum fasciculatum var. *foliolosum*

RHAMNACEAE
Ceanothus cuneatus var. *fascicularis*

ROSACEAE
Adenostoma fasciculatum
Cercocarpus betuloides

SCROPHULARIACEAE
Castilleja foliolosa

VISCACEAE
Phoradendron villosum

Monocots
POACEAE
Nassella lepida

LUCIAN COASTAL SCRUB VARIANT

Ferns and Fern Allies
DENNSTAEDTIACEAE
Pteridium aquilinum var. *pubescens*

DRYOPTERIDACEAE
Dryopteris arguta

POLYPODIACEAE
Polypodium californicum var. *californicum*

SINOPTERIDACEAE
Pellaea andromedaefolia
Pellaea mucronata var. *mucronata*

Flowering Plants-Dicots
ANACARDIACEAE
Toxicodendron diversilobum

TABLE 2.3-1

APIACEAE
Apiastrum angustifolium
Conium maculatum
Daucus pusillus
Sanicula crassicaulis
Torilis nodosa
Yabea microcarpa

ASTERACEAE
Achillea millefolium
Artemisia californica
Artemisia douglasiana
Baccharis pilularis
Eriophyllum confertiflorum var. *confertiflorum*
Eriophyllum staechadifolium
Filago californica
Gnaphalium bicolor
Gnaphalium californicum
Gnaphalium canescens ssp. *beneolens*
Gnaphalium ramosissimum
Logfia gallica
Rafinesquia californica
Solidago californica
Solidago spathulata
Uropappus lindleyi

BRASSICACEAE
Arabis glabra var. *glabra*

CARYOPHYLLACEAE
Silene gallica
Stellaria nitens

CHENOPODIACEAE
Chenopodium californicum

CONVOLVULACEAE
Calystegia macrostegia ssp. *cyclostegia*

CUCURBITACEAE
Marah fabaceus var. *agrestis*

FABACEAE
Lotus scoparius var. *scoparius*
Lupinus albifrons var. *albifrons*
Lupinus hirsutissimus
Trifolium gracilentum var. *gracilentum*
Trifolium willdenovii
Vicia gigantea

FAGACEAE
Quercus agrifolia

HYDROPHYLLACEAE
Phacelia imbricata ssp. *imbricata*
Phacelia parryi
Phacelia rattanii
Phacelia viscida

LAMIACEAE
Salvia mellifera
Salvia spathacea

LAURACEAE
Umbellularia californica

LINACEAE
Linum lewisii

NYCTAGINACEAE
Mirabilis californica

OXALIDACEAE
Oxalis albicans ssp. *pilosa*

PAEONIACEAE
Paeonia californica

PAPAVERACEAE
Dendromecon rigida

POLEMONIACEAE
Gilia clivorum

POLYGONACEAE
Eriogonum elongatum var. *elongatum*
Eriogonum parvifolium
Pterostegia drymarioides

PRIMULACEAE
Anagallis arvensis

RANUNCULACEAE
Thalictrum fendleri var. *polycarpum*

RHAMNACEAE
Ceanothus griseus
Rhamnus californica ssp. *californica*
Rhamnus crocea

ROSACEAE
Fragaria vesca
Heteromeles arbutifolia
Rosa gymnocarpa

SCROPHULARIACEAE
Antirrhinum kelloggii
Antirrhinum nuttallianum
Linaria texana
Mimulus aurantiacus

SOLANACEAE
Nicotiana glauca

URTICACEAE
Parietaria hespera var. *californica*
Urtica dioica var. *holosericea*

VERBENACEAE
Verbena lasiostachys var. *lasiostachys*

Monocots
ALLIACEAE
Dichelostemma capitatum

LILIACEAE
Fritillaria biflora

MELANTHIACEAE
Zigadenus fremontii

POACEAE
Agrostis pallens
Bromus hordeaceus
Bromus madritensis ssp. *rubens*
Cortaderia jubata
Gastridium ventricosum
Lamarckia aurea
Leymus condensatus
Nassella lepida
Nassella pulchra

COASTAL LIVE OAK SCRUB

Flowering Plants-Dicots
ANACARDIACEAE
Toxicodendron diversilobum

ASTERACEAE
Achillea millefolium
Gnaphalium purpureum
Lagophylla ramosissima
Logfia gallica
Madia gracilis
Solidago californica
Uropappus lindleyi

BORAGINACEAE
Amsinckia menziesii var. *intermedia*

EUPHORBIACEAE
Eremocarpus setigerus

FABACEAE
Trifolium depauperatum var. *truncatum*

GERANIACEAE
Erodium cicutarium

LAMIACEAE
*Monardella villosa sub*sp. *obispoensis*

ONAGRACEAE
Clarkia bottae
Clarkia affinis

PLANTAGINACEAE
Plantago erecta

RUBIACEAE
Galium andrewsii

SCROPHULARIACEAE
Castilleja exserta ssp. *exserta*

VIOLACEAE
Viola pedunculata

Monocots
IRIDACEAE
Sisyrinchium bellum

ORCHIDACEAE
Piperia elongata

POACEAE
Festuca californica
Hordeum brachyantherum
Koeleria macrantha
Vulpia bromoides
Agrostis hoovevi

ANNUAL GRASSLAND

Flowering Plants-Dicots

APIACEAE
- *Daucus pusillus*
- *Sanicula arguta*
- *Sanicula crassicaulis*

ASTERACEAE
- *Agoseris heterophylla*
- *Anthemis cotula*
- *Centaurea melitensis*
- *Evax sparsiflora*
- *Gnaphalium purpureum*
- *Hemizonia paniculata*
- *Hesperevax sparsiflora*
- *Heterotheca grandiflora*
- *Hypochoeris glabra*
- *Hypochoeris radicata*
- *Lactuca saligna*
- *Lactuca serriola*
- *Lagophylla ramosissima*
- *Lasthenia californica*
- *Layia platyglossa*
- *Lessingia filaginifolia* var. *filaginifolia*
- *Logfia gallica*
- *Madia gracilis*
- *Micropus californicus* var. *subvestitus*
- *Microseris douglasii* ssp. *douglasii*
- *Microseris elegans*
- *Psilocarphus tenellus* var. *tenellus*
- *Senecio vulgaris*
- *Silybum marianum*
- *Soliva sessilis*
- *Sonchus asper*
- *Stebbinsoseris heterocarpa*

BORAGINACEAE
- *Amsinckia menziesii* var. *intermedia*
- *Cryptantha clevelandii*
- *Plagiobothrys nothofulvus*

BRASSICACEAE
- *Capsella bursa-pastoris*
- *Hirschfeldia geniculata*
- *Sisymbrium officinale*
- *Thysanocarpus laciniatus*

CARYOPHYLLACEAE
- *Cerastium glomeratum*
- *Sagina decumbens*
- *Silene gallica*

CRASSULACEAE
- *Crassula connata*

EUPHORBIACEAE
- *Eremocarpus setigerus*

FABACEAE
- *Astragalus gambelianus*
- *Lotus micranthus*
- *Lotus strigosus*
- *Lotus wrangelianus*
- *Lupinus bicolor*
- *Lupinus hirsutissimus*
- *Trifolium albopurpureum* var. *olivaceum*
- *Trifolium ciliolatum*
- *Trifolium depauperatum* var. *truncatum*
- *Trifolium fragiferum*
- *Trifolium hirtum*
- *Trifolium microcephalum*
- *Trifolium willdenovii*
- *Vicia sativa* var. *sativa*

GERANIACEAE
- *Erodium botrys*
- *Erodium cicutarium*
- *Erodium moschatum*

LINACEAE
- *Linum lewisii*

ONAGRACEAE
- *Clarkia modesta*

PAPAVERACEAE
- *Eschscholtzia californica*
- *Platystemon californicus*

PLANTAGINACEAE
- *Plantago erecta*

POLEMONIACEAE
- *Gilia clivorum*
- *Microsteris gracilis*

POLYGONACEAE
- *Rumex pulcher*

PORTULACACEAE
- *Calandrinia ciliata*

RANUNCULACEAE
- *Ranunculus californicus*

ROSACEAE
Aphanes occidentalis

SCROPHULARIACEAE
Castilleja densiflora ssp. *obispoensis*
Castilleja exserta ssp. *exserta*
Triphysaria pusilla

VALERIANACEAE
Plectritis brachystemon

VIOLACEAE
Viola pedunculata

Monocots
IRIDACEAE
Sisyrinchium bellum

JUNCACEAE
Juncus bufonius var. *bufonius*

POACEAE
Avena barbata
Bromus diandrus
Bromus hordeaceus
Bromus madritensis ssp. *rubens*
Danthonia californica var. *californica*
Gastridium ventricosum
Nassella pulchra
Vulpia bromoides
Vulpia microstachys var. *pauciflora*
Vulpia myuros var. *myuros*

PONDS, SEEPS, AND STREAMS

Ferns and Fern Allies
AZOLLACEAE
Azolla filiculoides

BLECHNACEAE
Woodwardia fimbriata

Flowering Plants-Dicots
APIACEAE
Berula erecta
Cicuta douglasii
Hydrocotyle verticillata

ASTERACEAE
Artemisia biennis
Baccharis douglasii
Cotula coronopifolia
Gnaphalium stramineum
Helenium puberulum
Sonchus asper
Xanthium strumarium

BORAGINACEAE
Amsinckia spectabilis

BRASSICACEAE
Brassica rapa
Nasturtium officinale

CARYOPHYLLACEAE
Spergularia marina

CORNACEAE
Cornus sericea ssp. *occidentalis*

FABACEAE
Medicago polymorpha
Melilotus alba
Melilotus indica
Trifolium repens
Vicia gigantea

GERANIACEAE
Geranium dissectum

HALORAGIDACEAE
Myriophyllum brasiliense

LAMIACEAE
Melissa officinalis
Mentha arvensis

LYTHRACEAE
Lythrum hyssopifolia

ONAGRACEAE
Epilobium ciliatum ssp. *ciliatum*

PLANTAGINACEAE
Plantago major

SALICACEAE
Salix lasiolepis

SCROPHULARIACEAE
Mimulus guttatus

TROPAEOLACEAE
Tropaeolum majus

URTICACEAE
Urtica dioica var. *holosericea*

VERBENACEAE
Verbena lasiostachys var. *lasiostachys*

CYPERACEAE
Scirpus acutus
Scirpus cernuus
Scirpus microcarpus

JUNCACEAE
Juncus bufonius var. *bufonius*
Juncus patens
Juncus phaeocephalus var. *phaeocephalus*

Monocots
LEMNACEAE
Lemna minuscula
Wolffiella lingulata

POACEAE
Agrostis stolonifera
Distichlis spicata

POTAMOGETONACEAE
Potamogeton foliosus

ZANNICHELLIACEAE
Zannichellia palustris

COAST LIVE OAK WOODLAND

Ferns and Fern Allies
DENNSTAEDTIACEAE
Pteridium aquilinum var. *pubescens*

DRYOPTERIDACEAE
Dryopteris arguta

SINOPTERIDACEAE
Adiantum jordanii
Pellaea andromedaefolia
Pentagramma triangularis var. *triangularis*

Conifers
PINACEAE
Pinus muricata

Flowering Plants-Dicots
ANACARDIACEAE
Toxicodendron diversilobum

APIACEAE
Osmorhiza chilensis
Sanicula crassicaulis
Torilis arvensis ssp. *purpurea*
Yabea microcarpa

APOCYNACEAE
Vinca major

ASTERACEAE
Acourtia microcephala
Agoseris grandiflora
Aster radulinus
Baccharis pilularis
Eriophyllum confertiflorum var. *confertiflorum*
Gnaphalium californicum
Gnaphalium canescens ssp. *beneolens*
Silybum marianum
Sonchus oleraceus
Stephanomeria virgata ssp. *pleurocarpa*

BRASSICACEAE
Cardamine californica var. *integrifolia*
Sisymbrium officinale
Thysanocarpus laciniatus

CAPRIFOLIACEAE
Lonicera hispidula vacillans
Sambucus mexicana
Symphoricarpos mollis

CARYOPHYLLACEAE
Silene laciniata ssp. *major*
Stellaria media

CONVOLVULACEAE
Calystegia macrostegia ssp. *cyclostegia*

CUSCUTACEAE
Cuscuta californica var. *californica*

ERICACEAE
Gaultheria shallon
Vaccinium ovatum

EUPHORBIACEAE
Euphorbia spathulata

TABLE 2.3-1

FABACEAE
Lathyrus vestitus
Lotus purshianus
Lotus strigosus
Lupinus albifrons var. *albifrons*
Lupinus latifolia var. *latifolia*
Lupinus truncatus
Medicago polymorpha
Rupertia physodes
Trifolium gracilentum var. *gracilentum*
Vicia ludoviciana ssp. *ludoviciana*

FAGACEAE
Quercus agrifolia

GERANIACEAE
Geranium molle

GROSSULARIACEAE
Ribes speciosum

HYDROPHYLLACEAE
Eucrypta chrysanthemifolia
Phacelia cicutaria var. *hispida*
Phacelia distans
Phacelia imbricata ssp. *imbricata*
Phacelia nemoralis
Phacelia rattanii
Pholistoma auritum var. *auritum*

LAMIACEAE
Marrubium vulgare
Salvia mellifera
Salvia spathacea
Satureja douglasii
Stachys bullata

LAURACEAE
Umbellularia californica

ONAGRACEAE
Clarkia epilobioides

PAEONIACEAE
Paeonia californica

POLYGONACEAE
Pterostegia drymarioides

PORTULACACEAE
Claytonia parviflora ssp. *parviflora*
Claytonia perfoliata ssp. *mexicana*

PRIMULACEAE
Dodecatheon clevelandii ssp. *sanctarum*

RANUNCULACEAE
Actaea rubra
Ranunculus californicus
Thalictrum fendleri var. *polycarpum*

RHAMNACEAE
Rhamnus californica ssp. *californica*
Rhamnus crocea

ROSACEAE
Aphanes occidentalis
Heteromeles arbutifolia
Holodiscus discolor
Potentilla glandulosa ssp. *glandulosa*

RUBIACEAE
Galium aparine
Galium porrigens var. *porrigens*

SAXIFRAGACEAE
Lithophragma cymbalaria
Saxifraga californica

SCROPHULARIACEAE
Antirrhinum kelloggii
Castilleja affinis ssp. *affinis*
Collinsia heterophylla
Linaria texana
Mimulus aurantiacus
Scrophularia californica ssp. *californica*

SOLANACEAE
Solanum douglasii
Solanum umbelliferum

URTICACEAE
Parietaria hespera var. *californica*
Urtica urens

VERBENACEAE
Verbena lasiostachys var. *lasiostachys*

VIOLACEAE
Viola pedunculata

VISCACEAE
Phoradendron villosum

Monocots
ALLIACEAE
Dichelostemma capitatum

CONVALLARIACEAE
Smilacina racemosa
Smilacina stellata

IRIDACEAE
Sisyrinchium bellum

JUNCACEAE
Luzula subsessilis

LILIACEAE
Fritillaria affinis

POACEAE
Agrostis exarata var. *exarata*
Bromus carinatus var. *carinatus*
Bromus diandrus
Melica imperfecta
Poa howellii
Vulpia octoflora var. *hirtella*

CENTRAL COAST RIPARIAN SCRUB

Ferns and Fern Allies
EQUISETACEAE
Equisetum telmateia var. *braunii*

SINOPTERIDACEAE
Pentagramma triangularis var. *triangularis*

Flowering Plants-Dicots
ACERACEAE
Acer macrophyllum

ANACARDIACEAE
Toxicodendron diversilobum

APIACEAE
Cicuta douglasii
Conium maculatum
Sanicula crassicaulis

ASTERACEAE
Baccharis pilularis
Helenium puberulum

CAPRIFOLIACEAE
Lonicera involucrata var. *ledebourii*
Sambucus mexicana

CORNACEAE
Cornus sericea ssp. *occidentalis*

FABACEAE
Vicia gigantea

GROSSULARIACEAE
Ribes divaricatum var. *pubiflorum*
Ribes menziesii

LAMIACEAE
Marrubium vulgare
Stachys bullata

LAURACEAE
Umbellularia californica

MYRICACEAE
Myrica californica

PLANTAGINACEAE
Plantago major

POLYGONACEAE
Polygonum hydropiper

PRIMULACEAE
Anagallis arvensis

RANUNCULACEAE
Clematis ligusticifolia
Thalictrum fendleri var. *polycarpum*

RHAMNACEAE
Rhamnus californica ssp. *californica*

ROSACEAE
Rubus parviflorus var. *parviflorus*
Rubus ursinus

SALICACEAE
Salix lasiolepis
Salix lucida ssp. *lasiandra*

SCROPHULARIACEAE
Mimulus aurantiacus
Mimulus guttatus
Scrophularia californica ssp. *californica*

SOLANACEAE
Solanum douglasii

URTICACEAE
Urtica dioica var. *holosericea*

VERBENACEAE
Verbena lasiostachys var. *lasiostachys*

Monocots
CYPERACEAE
Cyperus eragrostis
Scirpus microcarpus

JUNCACEAE
Juncus patens

POACEAE
Agrostis exarata var. *exarata*
Pennisetum clandestinum

INLAND ROCK OUTCROPS

Ferns and Fern Allies
SINOPTERIDACEAE
Pellaea mucronata var. *mucronata*

Conifers
PINACEAE
Pinus muricata

Flowering Plants-Dicots
ANACARDIACEAE
Toxicodendron diversilobum

ASTERACEAE
Malacothrix phaeocarpa
Senecio aphanactis

BORAGINACEAE
Cryptantha muricata

CARYOPHYLLACEAE
Spergula arvensis

CRASSULACEAE
Crassula connata
Dudleya pulverulenta
Dudleya lanceolata

FABACEAE
Lupinus cervinus
Lupinus concinnus

HYDROPHYLLACEAE
Phacelia parryi

LAMIACEAE
Salvia columbariae

ONAGRACEAE
Clarkia epilobioides

PAPAVERACEAE
Dendromecon rigida
Eschscholtzia caespitosa

POLEMONIACEAE
Gilia achilleifolia ssp. *achilleifolia*

POLYGONACEAE
Eriogonum elongatum var. *elongatum*
Pterostegia drymarioides

SCROPHULARIACEAE
Antirrhinum kelloggii
Antirrhinum multiflorum
Antirrhinum nuttallianum
Mimulus aurantiacus

Monocots
POACEAE
Lamarckia aurea
Poa secunda

ROCKY BEACH

AIZOACEAE
Tetragonia tetragonioides

BRASSICACEAE
Cakile maritima

GERANIACEAE
Erodium moschatum

COASTAL GRASSLAND TERRACES

Flowering Plants-Dicots
ASTERACEAE
Achillea millefolium
Hemizonia fasciculata
Lasthenia californica
Layia platyglossa
Lessingia filaginifolia var. *filaginifolia*
Sonchus asper

BORAGINACEAE
Amsinckia menziesii var. *intermedia*
Amsinckia spectabilis

GERANIACEAE
Erodium moschatum

MALVACEAE
Sidalcea malviflora ssp. *Californica*

PAPAVERACEAE
Eschscholtzia californica

PLANTAGINACEAE
Plantago coronopus

POACEAE
Avena barbata
Bromus diandrus
Bromus marginatus var. *maritima*
Bromus mollis
Danthonia californica
Distichlis spicata
Elymus glaucus
Hordeum brachyantherum
Hordeum geniculatum
Hordeum leporinum
Koeleria macranthe
Leymus pacificus
Lolium multiflorum
Melica californica
Melica imperfecta
Nassella pulchra
Vulpia myuvos

SCROPHULARIACEAE
Castilleja densiflora ssp. *obispoensis*

SUBMERGED AQUATICS

Monocots
ZOSTERACEAE
Phyllospadix scouleri

TABLE 2.3-2

SENSITIVE PLANT SPECIES POTENTIALLY OCCURRING IN THE ISFSI VICINITY[a]

Species	Common Name	USFWS Status	CDFG Status	CNPS Status	Habitat in Proj Area	Occurrence Potential	Found in ISFSI Area
Arctostaphylos Cruzensi	Arroyo De La Cruz Manzanita	SC	-	1B	No	Low	No
Arctostaphylos Morroensis	Morro Manzanita	T	-	1B	No	Low	No
Arctostaphylos Pechoensis	Pecho Manzanita	SC	-	1B	No	Low	No
Arctostaphylos Wellsii	Wells' Manzanita	SC	-	1B	No	Low	No
Carex Obispoensis	San Luis Sedge	-	-	4	Yes	Mod	No
Chorizanthe Breweri	Brewer's Spineflower	-	-	1B	No	Low	No
Calochortus obispoensis	San Luis Mariposa lily	-	-	1B	No	Low	No
Eriodctyon Altissimum	Indian Knob Mtn. Balm	E	E	1B	No	Low	No
Layia Jonesii	Jones' layia	SC	-	1B	No	Low	No

[a]Notes: California Native Plant Society (CNPS) ranks are: 1A = plant presumed extinct in California, based on 1994 inventory; 1B = plants rare and endangered in California and elsewhere; 4 = plants of limited distribution in California. California Department of Fish and Game (CDFG) ranks are: E = endangered; T = threatened; R = rare. U.S. Fish and Wildlife Service (USFWS) ranks are: E = endangered; T = Threatened; PE = proposed for endangered status; PT = proposed for threatened status; SC = Species of Concern.

TABLE 2.3-3

CALIFORNIA WILDLIFE HABITAT RELATIONSHIPS PROGRAM[a]
SPECIES LIST FOR HABITATS OCCURRING ON THE DIABLO CANYON LANDS

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
A001	CALIFORNIA TIGER SALAMANDER	6 7 10					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	M	M	M
			Yearlong	COASTAL OAK WOODLAND5P	L	L	L
			Yearlong	COASTAL OAK WOODLAND5M	L	L	L
			Yearlong	ANNUAL GRASSID	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	L	L	L
A007	CALIFORNIA NEWT	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	H	H	H
			Yearlong	COASTAL OAK WOODLAND5P	H	H	H
			Yearlong	COASTAL OAK WOODLAND5M	H	H	H
			Yearlong	COASTAL OAK WOODLAND5D	L	L	L
			Yearlong	COASTAL SCRUB2S	L	L	L
			Yearlong	COASTAL SCRUB3D	M	M	M
			Yearlong	COASTAL SCRUB4M	H	H	H
			Yearlong	COASTAL SCRUB4D	M	M	M
			Yearlong	MIXED CHAPARRAL4M	H	H	H
			Yearlong	MIXED CHAPARRAL4D	M	M	M
			Yearlong	ANNUAL GRASSID	L	L	L
			Yearlong	FRESH EMERGENT WETLAND2M	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2D	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	M	M	M
A012	ENSATINA	7 12					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	L	L	L
			Yearlong	COASTAL OAK WOODLAND5P	L	L	L
			Yearlong	COASTAL OAK WOODLAND5M	H	H	H
			Yearlong	COASTAL OAK WOODLAND5D	H	H	H
			Yearlong	COASTAL SCRUB	L	L	L
			Yearlong	COASTAL SCRUB2S	L	L	L
			Yearlong	COASTAL SCRUB3D	L	L	L
			Yearlong	COASTAL SCRUB4M	L	L	L
			Yearlong	COASTAL SCRUB4D	L	L	L
			Yearlong	MIXED CHAPARRAL4M	L	L	L
			Yearlong	MIXED CHAPARRAL4D	L	L	L
			Yearlong	CLOSED-CONE PINE CYPRESS5M	L	L	L
			Yearlong	CLOSED-CONE PINE CYPRESS5D	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	H	H	H
A016	PACIFIC SLENDER SALAMANDER	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	M	M	M
			Yearlong	COASTAL OAK WOODLAND5P	M	M	M
			Yearlong	COASTAL OAK WOODLAND5M	H	H	H
			Yearlong	COASTAL OAK WOODLAND5D	H	H	H
			Yearlong	COASTAL SCRUB	M	M	M
			Yearlong	COASTAL SCRUB2S	M	M	M
			Yearlong	COASTAL SCRUB3D	M	M	M
			Yearlong	COASTAL SCRUB4M	M	M	M
			Yearlong	COASTAL SCRUB4D	M	M	M
			Yearlong	MIXED CHAPARRAL4M	M	M	M
			Yearlong	MIXED CHAPARRAL4D	M	M	M
			Yearlong	ANNUAL GRASSID	L	L	L

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
			Yearlong	FRESH EMERGENT WETLAND2M	L	L	L
			Yearlong	FRESH EMERGENT WETLAND2D	L	L	L
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	L	L	L
			Yearlong	CLOSED-CONE PINE-CYPRESS5D	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	H	H	H
A028	WESTERN SPADEFOOT	6 7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	M	M	M
			Yearlong	COASTAL OAK WOODLAND5P	M	M	M
			Yearlong	COASTAL OAK WOODLAND5M	L	L	L
			Yearlong	COASTAL SCRUB	L	L	L
			Yearlong	COASTAL SCRUB2S	L	L	L
			Yearlong	COASTAL SCRUB3D	L	L	L
			Yearlong	COASTAL SCRUB4M	L	L	L
			Yearlong	COASTAL SCRUB4D	L	L	L
			Yearlong	MIXED CHAPARRAL4M	L	L	L
			Yearlong	MIXED CHAPARRAL4D	L	L	L
			Yearlong	ANNUAL GRASSID	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2M	H	M	M
			Yearlong	FRESH EMERGENT WETLAND2D	H	M	M
			Yearlong	IRRIGATED ROW AND FIELD CRO	L	L	L
A035	SOUTHWESTERN TOAD	1 6 7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	MIXED CHAPARRAL4M	L	L	L
			Yearlong	MIXED CHAPARRAL4D	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	M	M	M
A040	RED-LEGGED FROG	2 6 7 12					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	M	M	M
			Yearlong	COASTAL OAK WOODLAND5P	M	M	M
			Yearlong	COASTAL OAK WOODLAND5M	M	M	M
			Yearlong	COASTAL OAK WOODLAND5D	M	M	M
			Yearlong	COASTAL SCRUB	L	L	H
			Yearlong	COASTAL SCRUB2S	H	H	H
			Yearlong	COASTAL SCRUB3D	H	H	H
			Yearlong	COASTAL SCRUB4M	H	H	H
			Yearlong	COASTAL SCRUB4D	H	H	H
			Yearlong	MIXED CHAPARRAL4M	L	L	L
			Yearlong	MIXED CHAPARRAL4D	L	L	L
			Yearlong	ANNUAL GRASSID	M	M	M
			Yearlong	FRESH EMERGENT WETLAND2M	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2D	H	M	M
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	L	L	L
			Yearlong	CLOSED-CONE PINE-CYPRESS5D	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	L	L	L
A043	FOOTHILL YELLOW-LEGGED FROG	6 7 12					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	L	L	L
			Yearlong	COASTAL OAK WOODLAND5P	L	L	L
			Yearlong	COASTAL OAK WOODLAND5M	L	L	L
			Yearlong	COASTAL OAK WOODLAND5D	L	L	L
			Yearlong	COASTAL SCRUB		L	L
			Yearlong	COASTAL SCRUB2S		L	L
			Yearlong	COASTAL SCRUB3D		L	L

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
			Yearlong	COASTAL SCRUB4M		L	L
			Yearlong	COASTAL SCRUB4D		L	L
			Yearlong	MIXED CHAPARRAL4M		L	L
			Yearlong	ANNUAL GRASSID	L	L	L
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	L	L	L
			Yearlong	CLOSED-CONE PINE-CYPRESS5D	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P		H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5M		H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5D		H	H
6	BULLFROG	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	M	M	M
			Yearlong	COASTAL OAK WOODLAND5P	M	M	M
			Yearlong	COASTAL OAK WOODLAND5M	M	M	M
			Yearlong	COASTAL OAK WOODLAND5D	M	M	M
			Yearlong	COASTAL SCRUB	L	L	L
			Yearlong	COASTAL SCRUB2S	M	L	L
			Yearlong	COASTAL SCRUB3D	M	M	M
			Yearlong	COASTAL SCRUB4M	M	M	M
			Yearlong	COASTAL SCRUB4D	M	M	M
			Yearlong	MIXED CHAPARRAL4M	M	M	M
			Yearlong	MIXED CHAPARRAL4D	M	M	M
			Yearlong	ANNUAL GRASSID	L	H	H
			Yearlong	FRESH EMERGENT WETLAND2M	M	H	H
			Yearlong	FRESH EMERGENT WETLAND2D	M	H	H
			Yearlong	URBANT	M	M	M
			Yearlong	IRRIGATED ROW AND FIELD CRO	L	L	L
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	L	L	L
			Yearlong	CLOSED-CONE PINE-CYPRESS5D	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	M	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	M	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	M	M	M
B043	BROWN PELICAN	1 3 5					
			Yearlong	SAN LUIS OBISPO			
			Summer	COASTAL SCRUB	M	M	
			Summer	COASTAL SCRUB2S	M	M	
			Summer	COASTAL SCRUB4M	L	L	
			Summer	ANNUAL GRASSID	H	H	
			Yearlong	MARINE4G		M	
			Yearlong	MARINEAR		M	
B044	DOUBLE-CRESTED CORMORANT	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	MARINE4G	H	H	
			Yearlong	MARINE4R	H	H	
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	L	L	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	L	L	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	L	L	H
B050	LEAST BITTERN	7	Summer	SAN LUIS OBISPO			
			Yearlong	FRESH EMERGENT WETLAND2M	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2D	H	H	H
B062	WHITE-FACED IBIS	7					
			Migrant	SAN LUIS OBISPO			
			Yearlong	ANNUAL GRASSID			L
			Yearlong	FRESH EMERGENT WETLAND2M	M	M	M
			Yearlong	FRESH EMERGENT WETLAND2D	H	H	L
			Yearlong	IRRIGATED ROW AND FIELD CRO		L	M
B070	GREATER WHITE-FRONTED GOOSE	14					
			Winter	SAN LUIS OBISPO			

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
			Winter	ANNUAL GRASSID		L	H
			Winter	FRESH EMERGENT WETLAND2M		H	H
			Winter	FRESH EMERGENT WETLAND2D		H	H
			Winter	IRRIGATED ROW AND FIELD CRO		M	M
B071	SNOW GOOSE	14					
			Winter	SAN LUIS OBISPO			
			Winter	ANNUAL GRASSID		L	H
			Winter	FRESH EMERGENT WETLAND2M		H	H
			Winter	FRESH EMERGENT WETLAND2D		H	H
			Winter	IRRIGATED ROW AND FIELD CRO		M	M
B072	ROSS GOOSE	14					
			Winter	SAN LUIS OBISPO			
			Winter	ANNUAL GRASSID		L	H
			Winter	FRESH EMERGENT WETLAND2M		M	H
			Winter	FRESH EMERGENT WETLAND2D		L	H
B074	BRANT	14					
			Yearlong	SAN LUIS OBISPO			
			Winter	ANNUAL GRASSID			H
			Winter	MARINE4G			L
B075	CANADA GOOSE	2 14					
			Winter	SAN LUIS OBISPO			
			Yearlong	ANNUAL GRASSID	L	H	H
			Yearlong	FRESH EMERGENT WETLAND2M	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2D	H	H	H
			Yearlong	URBANT		L	L
B076	WOOD DUCK	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	M	M	M
			Yearlong	COASTAL OAK WOODLAND5P	H	H	H
			Yearlong	COASTAL OAK WOODLAND5M	H	H	H
			Yearlong	COASTAL OAK WOODLAND5D	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2M		H	H
			Yearlong	FRESH EMERGENT WETLAND2D		H	H
			Yearlong	URBANT	M	M	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	H	H	H
B077	GREEN-WINGED TEAL	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	ANNUAL GRASSID	M	M	H
			Yearlong	FRESH EMERGENT WETLAND2M	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2D	H	H	H
			Yearlong	URBANT		L	L
B079	MALLARD	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	ANNUAL GRASSID	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2M	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2D	H	H	H
			Yearlong	URBANI	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	L	L	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	L	L	M
B080	NORTHERN PINTAIL	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	ANNUAL GRASSID	M	M	H
			Yearlong	FRESH EMERGENT WETLAND2M	L	H	H
			Yearlong	FRESH EMERGENT WETLAND2D	L	H	H

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
			Yearlong	URBANI		M	M
B082	BLUE-WINGED TEAL	14					
			Yearlong	SAN LUIS OBISPO			
			Summer	ANNUAL GRASSID	L	L	L
			Summer	FRESH EMERGENT WETLAND2M	H	H	M
			Summer	FRESH EMERGENT WETLAND2D	H	H	M
B083	CINNAMON TEAL	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	FRESH EMERGENT WETLAND2M	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2D	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5P		L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5M		L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5D		L	L
B084	NORTHERN SHOVELER	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	ANNUAL GRASSID	M	H	
			Yearlong	FRESH EMERGENT WETLAND2M	M	H	H
			Yearlong	FRESH EMERGENT WETLAND2D	M	H	H
B085	GADWALL	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	ANNUAL GRASSID	H	H	L
			Yearlong	FRESH EMERGENT WETLAND2M		H	H
			Yearlong	FRESH EMERGENT WETLAND2D		H	H
B086	EURASIAN WIGEON	14					
			Winter	SAN LUIS OBISPO			
			Winter	ANNUAL GRASSID		M	M
			Winter	FRESH EMERGENT WETLAND2M		M	M
			Winter	FRESH EMERGENT WETLAND2D		M	M
			Winter	URBANI		L	L
B087	AMERICAN WIGEON	14					
			Winter	SAN LUIS OBISPO			
			Yearlong	ANNUAL GRASSID	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2M		H	H
			Yearlong	FRESH EMERGENT WETLAND2D		H	H
			Yearlong	URBANI		M	M
			Yearlong	IRRIGATED ROW AND FIELD CRO	L	L	M
B089	CANVASBACK	14					
			Winter	SAN LUIS OBISPO			
			Yearlong	FRESH EMERGENT WETLAND2M	H	H	M
			Yearlong	FRESH EMERGENT WETLAND2D	H	H	M
B090	REDHEAD	14					
			Winter	SAN LUIS OBISPO			
			Yearlong	FRESH EMERGENT WETLAND2M	H	H	L
			Yearlong	FRESH EMERGENT WETLAND2D	H	H	L
B091	RING-NECKED DUCK	14					
			Winter	SAN LUIS OBISPO			
			Summer	FRESH EMERGENT WETLAND2M	H	H	H
			Summer	FRESH EMERGENT WETLAND2D	H	H	H
B094	LESSER SCAUP	14					
			Winter	SAN LUIS OBISPO			
			Yearlong	FRESH EMERGENT WETLAND2M	M	M	
			Yearlong	FRESH EMERGENT WETLAND2D	H	H	
B096	HARLEQUIN DUCK	7 14					
			Winter	SAN LUIS OBISPO			
			Winter	MARINE4R		H	

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
B099	SURF SCOTER	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	MARINE4G		L	
			Yearlong	MARINE4R		L	
B101	COMMON GOLDENEYE	14					
			Winter	SAN LUIS OBISPO			
			Winter	VALLEY FOOTHILL RIPARIAN5P		M	M
			Winter	VALLEY FOOTHILL RIPARIAN5M		M	M
			Winter	VALLEY FOOTHILL RIPARIAN5D		M	M
B103	BUFFLEHEAD	14					
			Winter	SAN LUIS OBISPO			
			Winter	VALLEY FOOTHILL RIPARIAN5P		L	L
			Winter	VALLEY FOOTHILL RIPARIAN5M		L	L
			Winter	VALLEY FOOTHILL RIPARIAN5D		L	L
B104	HOODED MERGANSER	14					
			Winter	SAN LUIS OBISPO			
			Winter	FRESH EMERGENT WETLAND2M		M	M
			Winter	FRESH EMERGENT WETLAND2D		M	L
			Winter	URBANI		L	L
			Winter	VALLEY FOOTHILL RIPARIAN5P		H	H
			Winter	VALLEY FOOTHILL RPIARIAN5M		H	H
			Winter	VALLEY FOOTHILL RPIARIAN5D		H	H
B105	COMMON MERGANSER	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	FRESH EMERGENT WETLAND2M		M	H
			Yearlong	FRESH EMERGENT WETLAND2D		M	H
			Winter	URBANI		H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	H	H	H
			Yearlong	VALLEY FOOTHILL RPIARIAN5M	H	H	H
			Yearlong	VALLEY FOOTHILL RPIARIAN5D	H	H	H
B107	RUDDY DUCK	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	FRESH EMERGENT WETLAND2M	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2D	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5P		L	L
			Yearlong	VALLEY FOOTHILL RPIARIAN5M		L	L
			Yearlong	VALLEY FOOTHILL RPIARIAN5D		L	L
B109	CALIFORNIA CONDOR	1 3 5 13					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	H	H	M
			Yearlong	COASTAL OAK WOODLAND5P	H	H	M
			Yearlong	COASTAL OAK WOODLAND5M	H	H	L
			Yearlong	COASTAL OAK WOODLAND5D	H	H	H
			Yearlong	COASTAL SCRUB	H	H	M
			Yearlong	COASTAL SCRUB2S	H	H	M
			Yearlong	COASTAL SCRUB4M	H	H	M
			Yearlong	MIXED CHAPARRAL4M	H	H	L
			Yearlong	ANNUAL GRASSID			H
B110	OSPREY	7 13					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S		L	L
			Yearlong	COASTAL OAK WOODLAND5P		L	L
			Yearlong	COASTAL OAK WOODLAND5M		L	L
			Yearlong	COASTAL OAK WOODLAND5D		L	L
			Summer	MIXED CHAPARRAL4M			L
			Summer	MIXED CHAPARRAL4D			L
			Summer	ANNUAL GRASSID			L
			Summer	FRESH EMERGENT WETLAND2M			H

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
			Summer	FRESH EMERGENT WETLAND2D			H
			Summer	CLOSED-CONE PINE-CYPRESS5M		L	L
			Summer	CLOSED-CONE PINE-CYPRESS5D		L	L
			Summer	VALLEY FOOTHILL RIPARIAN5P	H	H	H
			Summer	VALLEY FOOTHILL RIPARIAN5M	H	H	H
			Summer	VALLEY FOOTHILL RIPARIAN5D	H	H	H
B113	BALD EAGLE	2 3 5 13					
			Winter	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	L	L	L
			Yearlong	COASTAL OAK WOODLAND5P	L	L	L
			Yearlong	COASTAL OAK WOODLAND5M	L	L	L
			Yearlong	COASTAL OAK WOODLAND5D	L	L	L
			Winter	COASTAL SCRUB			L
			Winter	COASTAL SCRUB2S			L
			Winter	COASTAL SCRUB3D			L
			Winter	COASTAL SCRUB4M			L
			Winter	COASTAL SCRUB4D			L
			Winter	MIXED CHAPARRAL4M			L
			Winter	MIXED CHAPARRAL4D			L
			Yearlong	ANNUAL GRASSID			L
			Yearlong	FRESH EMERGENT WETLAND2M			M
			Yearlong	FRESH EMERGENT WETLAND2D			M
			Yearlong	MARINE4G			L
			Yearlong	MARINE4R			L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	L	L	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	L	L	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	L	L	M
B114	NORTHERN HARRIER	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S			L
			Yearlong	COASTAL OAK WOODLAND5P			L
			Yearlong	COASTAL SCRUB		M	M
			Yearlong	COASTAL SCRUB2S		M	M
			Yearlong	COASTAL SCRUB4M			L
			Winter	MIXED CHAPARRAL4M		L	L
			Winter	MIXED CHAPARRAL4D		L	L
			Yearlong	ANNUAL GRASSID	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2M	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2D	H	H	H
			Yearlong	URBANI	L	L	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5P			L
B115	SHARP-SHINNED HAWK	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S		M	H
			Yearlong	COASTAL OAK WOODLAND5P		M	H
			Yearlong	COASTAL OAK WOODLAND5M		M	H
			Yearlong	COASTAL OAK WOODLAND5D		M	H
			Yearlong	COASTAL SCRUB			H
			Yearlong	COASTAL SCRUB2S			H
			Yearlong	COASTAL SCRUB3D		H	H
			Yearlong	COASTAL SCRUB4M		H	H
			Yearlong	COASTAL SCRUB4D		H	H
			Yearlong	MIXED CHAPARRAL4M		M	M
			Yearlong	MIXED CHAPARRAL4D		M	M
			Yearlong	ANNUAL GRASSID			M
			Yearlong	URBANI	M	H	H
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	L	M	H
			Yearlong	CLOSED-CONE PINE-CYPRESS5D	L	M	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5P		M	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5M		M	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5D		M	H

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
B116	COOPER'S HAWK	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S		H	H
			Yearlong	COASTAL OAK WOODLAND5P		H	H
			Yearlong	COASTAL OAK WOODLAND5M	H	H	H
			Yearlong	COASTAL OAK WOODLAND5D	H	H	H
			Yearlong	COASTAL SCRUB			M
			Yearlong	COASTAL SCRUB2S		L	M
			Yearlong	COASTAL SCRUB3D		M	M
			Yearlong	COASTAL SCRUB4M		M	M
			Yearlong	COASTAL SCRUB4D		M	M
			Yearlong	MIXED CHAPARRAL4M		L	L
			Yearlong	MIXED CHAPARRAL4D		L	L
			Yearlong	ANNUAL GRASSID			M
			Yearlong	URBANI	H	H	H
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	M	M	M
			Yearlong	CLOSED-CONE PINE-CYPRESS5D	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	L	L	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	L	L	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	L	L	H
B121	SWANSON'S HAWK	4 12					
			Summer	SAN LUIS OBISPO			
			Summer	COASTAL OAK WOODLAND5S	H	H	L
			Summer	COASTAL OAK WOODLAND5P	H	H	L
			Summer	COASTAL OAK WOODLAND5M	H	H	L
			Summer	ANNUAL GRASSID	M	M	H
			Summer	URBANI	M	M	H
			Summer	VALLEY FOOTHILL RIPARIAN5P	H	H	L
			Summer	VALLEY FOOTHILL RIPARIAN5M	H	H	L
			Summer	VALLEY FOOTHILL RIPARIAN5D	H	H	L
B124	FERRUGINOUS HAWK	7					
			Winter	SAN LUIS OBISPO			
			Winter	COASTAL OAK WOODLAND5S		H	M
			Winter	COASTAL OAK WOODLAND5P		H	M
			Winter	COASTAL OAK WOODLAND5M		M	M
			Winter	COASTAL SCRUB			M
			Winter	COASTAL SCRUB2S			M
			Winter	ANNUAL GRASSID		L	H
			Winter	FRESH EMERGENT WETLAND2M			L
			Winter	FRESH EMERGENT WETLAND2D			L
			Winter	VALLEY FOOTHILL RIPARIAN5P		L	L
			Winter	VALLEY FOOTHILL RIPARIAN5M		L	L
B126	GOLDEN EAGLE	5 7 13					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	H	H	H
			Yearlong	COASTAL OAK WOODLAND5P	H	H	H
			Yearlong	COASTAL OAK WOODLAND5M	H	H	M
			Yearlong	COASTAL OAK WOODLAND5D	H	H	L
			Yearlong	COASTAL SCRUB	H	H	H
			Yearlong	COASTAL SCRUB2S	H	H	H
			Yearlong	COASTAL SCRUB3D	H	H	L
			Yearlong	COASTAL SCRUB4M	H	H	M
			Yearlong	COASTAL SCRUB4D	H	H	L
			Yearlong	MIXED CHAPARRAL4M	L	L	M
			Yearlong	MIXED CHAPARRAL4D	H	H	L
			Yearlong	ANNUAL GRASSID	L	L	H
			Yearlong	FRESH EMERGENT WETLAND2M			M
			Yearlong	FRESH EMERGENT WETLAND2D			L
			Yearlong	URBANI			L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	H	H	L

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
B128	MERLIN	7					
			Winter	SAN LUIS OBISPO			
			Winter	COASTAL OAK WOODLAND5S		H	H
			Winter	COASTAL OAK WOODLAND5P		M	M
			Winter	COASTAL OAK WOODLAND5M		L	L
			Winter	COASTAL SCRUB			L
			Winter	COASTAL SCRUB2S			L
			Winter	COASTAL SCRUB3D		L	L
			Winter	COASTAL SCRUB4M		L	L
			Winter	COASTAL SCRUB4D		L	L
			Winter	MIXED CHAPARRAL4M		L	L
			Winter	MIXED CHAPARRAL4D		L	L
			Winter	ANNUAL GRASSID			M
			Winter	FRESH EMERGENT WETLAND2M			M
			Winter	FRESH EMERGENT WETLAND2D			M
			Winter	URBANI		M	H
			Winter	IRRIGATED ROW AND FIELD CRO		M	H
			Winter	MARINE4G			H
			Winter	MARINE4R			H
			Winter	VALLEY FOOTHILL RIPARIAN5P		M	M
			Winter	VALLEY FOOTHILL RIPARIAN5M		L	L
			Winter	VALLEY FOOTHILL RIPARIAN5D		L	L
B129	PEREGRINE FALCON	1 3 5 13					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	H	H	M
			Yearlong	COASTAL OAK WOODLAND5P	H	H	M
			Yearlong	COASTAL OAK WOODLAND5M	H	H	M
			Yearlong	COASTAL OAK WOODLAND5D	H	H	M
			Yearlong	COASTAL SCRUB	H	H	M
			Yearlong	COASTAL SCRUB2S	H	H	M
			Yearlong	COASTAL SCRUB3D	H	H	M
			Yearlong	COASTAL SCRUB4M	H	H	M
			Yearlong	COASTAL SCRUB4D	H	H	M
			Yearlong	MIXED CHAPARRAL4M	M	M	L
			Yearlong	MIXED CHAPARRAL4D	M	M	L
			Yearlong	ANNUAL GRASSID	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2M		H	H
			Yearlong	FRESH EMERGENT WETLAND2D		H	H
			Yearlong	URBANI	H	H	H
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	H	H	M
			Yearlong	CLOSED-CONE PINE-CYPRESS5D	H	H	M
			Yearlong	MARINE4G			H
			Yearlong	MARINE4R			H
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	H	H	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	H	H	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	H	H	M
B131	PRAIRIE FALCON	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	H	H	H
			Yearlong	COASTAL OAK WOODLAND5P	H	H	M
			Yearlong	COASTAL OAK WOODLAND5M	H	H	L
			Yearlong	COASTAL OAK WOODLAND5D	H	H	L
			Yearlong	COASTAL SCRUB	H	H	L
			Yearlong	COASTAL SCRUB2S	H	H	L
			Yearlong	COASTAL SCRUB3D	H	H	L
			Yearlong	COASTAL SCRUB4M	H	H	L
			Yearlong	COASTAL SCRUB4D	H	H	L
			Yearlong	MIXED CHAPARRAL4M	M	M	L
			Yearlong	MIXED CHAPARRAL4D	M	M	L
			Yearlong	ANNUAL GRASSID	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2M			L
			Yearlong	FRESH EMERGENT WETLAND2D			L
			Yearlong	URBANI		L	M

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	H	H	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	H	H	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	H	H	L
B132	CHUKAR	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	ANNUAL GRASSID	H	H	H
B133	RING-NECKED PHEASANT	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	ANNUAL GRASSID	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2M		H	H
			Yearlong	URBANI	M	M	M
			Yearlong	IRRIGATED ROW AND FIELD CRO	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5M		L	L
B138	WILD TURKEY	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	H	H	H
			Yearlong	COASTAL OAK WOODLAND5P	H	H	H
			Yearlong	COASTAL OAK WOODLAND5M	H	H	H
			Yearlong	COASTAL OAK WOODLAND5D	M	H	H
			Yearlong	COASTAL SCRUB			L
			Yearlong	COASTAL SCRUB2S			L
			Yearlong	COASTAL SCRUB3D		L	L
			Yearlong	COASTAL SCRUB4M		L	L
			Yearlong	COASTAL SCRUB4D		L	L
			Yearlong	MIXED CHAPARRAL4M		L	L
			Yearlong	MIXED CHAPARRAL4D		M	M
			Yearlong	ANNUAL GRASSID	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	M	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	M	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	M	H	H
B140	CALIFORNIA QUAIL	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	H	H	H
			Yearlong	COASTAL OAK WOODLAND5P	H	H	H
			Yearlong	COASTAL OAK WOODLAND5M	H	H	H
			Yearlong	COASTAL OAK WOODLAND5D	M	M	H
			Yearlong	COASTAL SCRUB	M	M	H
			Yearlong	COASTAL SCRUB2S	H	H	H
			Yearlong	COASTAL SCRUB3D	L	L	H
			Yearlong	COASTAL SCRUB4M	H	H	H
			Yearlong	COASTAL SCRUB4D	L	H	H
			Yearlong	MIXED CHAPARRAL4M	M	M	M
			Yearlong	MIXED CHAPARRAL4D	L	L	L
			Yearlong	ANNUAL GRASSID	M	M	H
			Yearlong	URBANI	M	M	H
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	L	H	M
			Yearlong	CLOSED-CONE PINE-CYPRESS5D		M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	M	M	H
B141	MOUNTAIN QUAIL	14					
			Yearlong	SAN LUIS OBISPO			
			Winter	COASTAL OAK WOODLAND5S	M	M	H
			Winter	COASTAL OAK WOODLAND5P	M	M	H
			Winter	COASTAL OAK WOODLAND5M	L	H	M
			Winter	COASTAL OAK WOODLAND5D	L	H	L
			Yearlong	COASTAL SCRUB	L	L	L
			Yearlong	COASTAL SCRUB2S	L	L	L
			Yearlong	COASTAL SCRUB4M		L	L

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
			Yearlong	MIXED CHAPARRAL4M	M	M	M
			Yearlong	MIXED CHAPARRAL4D	M	M	M
			Yearlong	ANNUAL GRASSID	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	L	M	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	L	H	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	L	H	L
B143	BLACK RAIL	4 5					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	FRESH EMERGENT WETLAND2M	M	M	H
			Yearlong	FRESH EMERGENT WETLAND2D	H	H	H
B144	CLAPPER RAIL	1 3 4 5					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	FRESH EMERGENT WETLAND2M	M	M	H
			Yearlong	FRESH EMERGENT WETLAND2D	H	H	H
B148	COMMON MOORHEN	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	FRESH EMERGENT WETLAND2M	H	H	H
			Yearlong	FRESH EMERGENTVWETLAND2D	H	H	H
			Yearlong	URBANI	H	H	H
B149	AMERICAN COOT	14					
			Yearlong	SAN LUIS OBISPO			
			Winter	ANNUAL GRASSID		L	H
			Yearlong	FRESH EMERGENT WETLAND2M	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2D	H	H	H
			Winter	URBANI	H	H	H
B150	SANDHILL CRANE	4 5 12					
			Winter	SAN LUIS OBISPO			
			Yearlong	ANNUAL GRASSID		M	M
			Yearlong	FRESH EMERGENT WETLAND2M	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2D	H	H	H
			Yearlong	IRRIGATED ROW AND FIELD CRO		M	H
B159	MOUNTAIN PLOVER	7 10					
			Winter	SAN LUIS OBISPO			
			Winter	IRRIGATED ROW AND FIELD CRO		H	H
B173	LONG-BILLED CURLEW	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	ANNUAL GRASSID		H	H
			Yearlong	FRESH EMERGENT WETLAND2M		H	M
			Yearlong	FRESH EMERGENT WETLAND2D		H	M
B199	COMMON SNIPE	14					
			Winter	SAN LUIS OBISPO			
			Yearlong	FRESH EMERGENT WETLAND2M	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2D	H	H	H
B215	CALIFORNIA GULL	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	ANNUAL GRASSID		L	M
			Yearlong	FRESH EMERGENT WETLAND2M		L	H
			Yearlong	URBANI		H	H
			Yearlong	IRRIGATED ROW AND FIELD CRO		H	H
			Yearlong	MARINE4G		H	H
			Yearlong	MARINE4R		H	H
B229	ELEGANT TERN	7					
			Summer	SAN LUIS OBISPO			
			Summer	MARINE4G		H	
			Summer	MARINE4R		M	

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
B234	LEAST TERN	1 3 5					
			Summer	SAN LUIS OBISPO			
			Summer	MARINE4G	H	H	
B235	BLACK TERN	7					
			Migrant	SAN LUIS OBISPO			
			Summer	FRESH EMERGENT WETLAND2M	H	H	H
			Summer	FRESH EMERGENT WETLAND2D	H	H	H
			Summer	MARINE4G		L	
B236	BLACK SKIMMER	7					
			Migrant	SAN LUIS OBISPO			
			Yearlong	MARINE4G		L	
B241	NANTUS' MURRELET	7					
			Winter	SAN LUIS OBISPO			
			Yearlong	MARINE4R	H	H	
B247	RHINOCEROS AUKLET	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL SCRUB	L	L	
			Yearlong	COASTAL SCRUB2S	H	H	
			Yearlong	COASTAL SCRUB3D	L	L	
			Yearlong	COASTAL SCRUB4M	H	H	
			Yearlong	COASTAL SCRUB4D	L	L	
	BAND-TAILED PIGEON	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	M	M	H
			Yearlong	COASTAL OAK WOODLAND5P	M	M	H
			Yearlong	COASTAL OAK WOODLAND5M	H	H	H
			Yearlong	COASTAL OAK WOODLAND5D	H	H	H
			Winter	COASTAL SCRUB3D			M
			Winter	COASTAL SCRUB4M			M
			Winter	COASTAL SCRUB4D			M
			Winter	MIXED CHAPARRAL4M		L	L
			Winter	MIXED CHAPARRAL4D		L	L
			Yearlong	URBANI	H	H	H
			Summer	CLOSED-CONE PINE-CYPRESS5M	M	M	
			Summer	CLOSED-CONE PINE-CYPRESS5D	M	M	
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	L	L	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	L	L	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	L	L	H
B254	WHITE-WINGED DOVE	14					
			Migrant	SAN LUIS OBISPO			
			Summer	COASTAL SCRUB			L
			Summer	COASTAL SCRUB2S			L
			Summer	COASTAL SCRUB3D		L	L
			Summer	COASTAL SCRUB4M		L	L
			Summer	COASTAL SCRUB4D		L	L
			Summer	URBANI	H	H	H
B255	MOURNING DOVE	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	H	H	H
			Yearlong	COASTAL OAK WOODLAND5P	H	H	H
			Yearlong	COASTAL OAK WOODLAND5M	H	H	H
			Yearlong	COASTAL OAK WOODLAND5D	L	L	L
			Yearlong	COASTAL SCRUB			M
			Yearlong	COASTAL SCRUB2S			M
			Yearlong	COASTAL SCRUB4M	L	L	M
			Yearlong	COASTAL SCRUB4D			L
			Yearlong	MIXED CHAPARRAL4M	L	L	M
			Yearlong	MIXED CHAPARRAL4D			L

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
			Yearlong	URBANI	H	H	H
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	M	M	M
			Yearlong	CLOSED-CONE PINE-CYPRESS5D	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	H	H	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	L	L	L
B269	BURROWING OWL	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL SCRUB	H	H	H
			Yearlong	COASTAL SCRUB2S	H	H	H
			Yearlong	COASTAL SCRUB4M	M	M	M
			Yearlong	MIXED CHAPARRAL4M	L	L	L
			Yearlong	ANNUAL GRASSID	M	M	M
			Yearlong	URBANI	H	H	H
B270	SPOTTED OWL	2 7 11 12 13					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAKS WOODLAND5S		L	L
			Yearlong	COASTAL OAKS WOODLAND5P		L	L
			Yearlong	COASTAL OAKS WOODLAND5M	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	M	M	M
B272	LONG-EARED OWL	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	L	L	M
			Yearlong	COASTAL OAK WOODLAND5P	M	M	M
			Yearlong	COASTAL OAK WOODLAND5M	H	H	M
			Yearlong	COASTAL OAK WOODLAND5D	H	H	L
			Yearlong	MIXED CHAPARRAL4M	L	L	H
			Yearlong	MIXED CHAPARRAL4D	L	L	H
			Yearlong	ANNUAL GRASSID			H
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	H	H	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	H	H	L
B273	SHORT-EARED OWL	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL SCRUB		M	M
			Yearlong	COASTAL SCRUB2S		M	M
			Yearlong	ANNUAL GRASSID	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2M	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2D	H	H	H
			Yearlong	URBANI		H	H
			Yearlong	IRRIGATED ROW AND FIELD CRO	L	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5P		L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5M		L	L
B279	BLACK SWIFT	7					
			Summer	SAN LUIS OBISPO			
			Summer	COASTAL OAK WOODLAND5S	L	L	L
			Summer	COASTAL OAK WOODLAND5P	L	L	L
			Summer	COASTAL OAK WOODLAND5M	L	L	L
			Summer	COASTAL OAK WOODLAND5D	L	L	L
			Summer	MIXED CHAPARRAL4M			L
			Summer	MIXED CHAPARRAL4D			L
			Summer	ANNUAL GRASSID			L
			Summer	URBANI			M
			Summer	CLOSED-CONE PINE-CYPRESS5M			L
			Summer	CLOSED-CONE PINE-CYPRESS5D			L
			Summer	MARINE4G			H
			Summer	MARINE4R	H	H	H

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
			Summer	VALLEY FOOTHILL RIPARIAN5P			L
			Summer	VALLEY FOOTHILL RIPARIAN5M			L
			Summer	VALLEY FOOTHILL RIPARIAN5D			L
B281	VAUX'S SWIFT	7					
			Migrant	SAN LUIS OBISPO			
			Summer	COASTAL OAK WOODLAND5S	L	L	L
			Summer	COASTAL OAK WOODLAND5P	L	L	L
			Summer	COASTAL OAK WOODLAND5M	L	L	L
			Summer	COASTAL OAK WOODLAND5D	L	L	L
			Summer	MIXED CHAPARRAL4M			L
			Summer	MIXED CHAPARRAL4D			L
			Summer	FRESH EMERGENT WETLAND2M			L
			Summer	FRESH EMERGENT WETLAND2D			L
			Summer	URBANI	L	L	M
			Summer	IRRIGATED ROW AND FIELD CRO			L
			Summer	CLOSED-CONE PINE-CYPRESS5M			L
			Summer	CLOSED-CONE PINE-CYPRESS5D			L
			Summer	VALLEY FOOTHILL RIPARIAN5P		L	L
			Summer	VALLEY FOOTHILL RIPARIAN5M		L	L
			Summer	VALLEY FOOTHILL RIPARIAN5D		L	L
B307	NORTHERN FLICKER	3					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	H	H	H
			Yearlong	COASTAL OAK WOODLAND5P	H	H	H
			Yearlong	COASTAL OAK WOODLAND5M	H	H	H
			Yearlong	COASTAL OAK WOODLAND5D	M	M	M
			Yearlong	COASTAL SCRUB			M
			Yearlong	COASTAL SCRUB2S			M
			Yearlong	COASTAL SCRUB3D			L
			Yearlong	COASTAL SCRUB4M		M	M
			Yearlong	COASTAL SCRUB4D			L
			Yearlong	MIXED CHAPARRAL4M		M	M
			Yearlong	MIXED CHAPARRAL4D		M	M
			Yearlong	ANNUAL GRASSID			H
			Yearlong	URBANI	H	H	H
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	H	H	H
			Yearlong	CLOSED-CONE PNIE-CYPRESS5D	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	M	M	M
B315	WILLOW FLYCATCHER	1 3 12					
			Migrant	SAN LUIS OBISPO			
			Summer	VALLEY FOOTHILL RIPARIAN5P	L	L	L
			Summer	VALLEY FOOTHILL RIPARIAN5M	L	L	L
			Summer	VALLEY FOOTHILL RIPARIAN5D	L	L	L
B337	HORNED-LARK	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	H	H	H
			Yearlong	ANNUAL GRASSID	M	M	M
B338	PURPLE MARTIN	7					
			Summer	SAN LUIS OBISPO			
			Summer	COASTAL OAK WOODLAND5S	H	H	M
			Summer	COASTAL OAK WOODLAND5P	H	H	M
			Summer	COASTAL OAK WOODLAND5M	H	H	M
			Summer	ANNUAL GRASSID			H
			Summer	FRESH EMERGENT WETLAND2M			H
			Summer	FRESH EMERGENT WETLAND2D			H
			Summer	URBANI	H	H	H
			Summer	CLOSED-CONE PINE-CYPRESS5M	L	L	L
			Summer	VALLEY FOOTHILL RIPARIAN5P	L	L	L

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
			Summer	VALLEY FOOTHILL RIPARIAN5M	L	L	L
B342	BANK SWALLOW	4					
			Migrant	SAN LUIS OBISPO			
			Summer	COASTAL SCRUB	H	H	M
			Summer	COASTAL SCRUB2S	H	H	M
			Summer	COASTAL SCRUB3D	H	H	M
			Summer	COASTAL SCRUB4M	H	H	M
			Summer	COASTAL SCRUB4D	H	H	M
			Migrant	MIXED CHAPARRAL4M			L
			Migrant	MIXED CHAPARRAL4D			L
			Summer	ANNUAL GRASSID	H	H	H
			Migrant	FRESH EMERGENT WETLAND2M			H
			Migrant	FRESH EMERGENT WETLAND2D			H
			Summer	URBANI			L
			Summer	IRRIGATED ROW AND FIELD CRO	H	H	M
			Summer	MARINE4G			L
			Summer	MARINE4R			L
			Summer	VALLEY FOOTHILL RIPARIAN5P	H	H	H
			Summer	VALLEY FOOTHILL RIPARIAN5M	H	H	M
			Summer	VALLEY FOOTHILL RIPARIAN5D	H	H	D
B348	WESTERN SCRUB-JAY	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	H	H	H
			Yearlong	COASTAL OAK WOODLAND5P	H	H	H
			Yearlong	COASTAL OAK WOODLAND5M	H	H	H
			Yearlong	COASTAL OAK WOODLAND5D	H	H	H
			Yearlong	COASTAL SCRUB			H
			Yearlong	COASTAL SCRUB2S		L	H
			Yearlong	COASTAL SCRUB3D	H	H	H
			Yearlong	COASTAL SCRUB4M	L	M	H
			Yearlong	COASTAL SCRUB4D	L	M	H
			Yearlong	MIXED CHAPARRAL4M	M	M	M
			Yearlong	MIXED CHAPARRAL4D	H	H	H
			Yearlong	URBANI	H	H	H
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	M	M	M
			Yearlong	CLOSED-CONE PINE-CYPRESS5D	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	H	H	H
B353	AMERICAN CROW	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	H	H	H
			Yearlong	COASTAL OAK WOODLAND5P	H	H	H
			Yearlong	COASTAL OAK WOODLAND5M	H	H	L
			Yearlong	COASTAL OAK WOODLAND5D	H	H	L
			Yearlong	ANNUAL GRASSID			H
			Yearlong	URBANI	H	H	H
			Yearlong	IRRIGATED ROW AND FIELD CRO			H
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	M	M	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	M	M	L
	CALIFORNIA THRASHER	2					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	L	L	L
			Yearlong	COASTAL SCRUB2S	L	L	H
			Yearlong	COASTAL SCRUB3D	H	H	H
			Yearlong	COASTAL SCRUB4M		H	H
			Yearlong	COASTAL SCRUB4D		H	H
			Yearlong	MIXED CHAPARRAL4M	H	H	H
			Yearlong	MIXED CHAPARRAL4D	H	H	H
			Yearlong	URBANI	M	M	M

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
B410	LOGGERHEAD SHRIKE	1 7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	H	H	H
			Yearlong	COASTAL OAK WOODLAND5P	H	H	H
			Yearlong	COASTAL OAK WOODLAND5M	M	M	M
			Yearlong	COASTAL SCRUB			M
			Yearlong	COASTAL SCRUB2S	M	M	M
			Yearlong	COASTAL SCRUB4M		L	L
			Yearlong	MIXED CHAPARRAL4M	L	L	L
			Yearlong	ANNUAL GRASSID		H	H
			Yearlong	URBANI		M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	L	L	L
B430	YELLOW WARBLER	7					
			Summer	SAN LUIS OBISPO			
			Summer	COASTAL OAK WOODLAND5S	L	M	H
			Summer	COASTAL OAK WOODLAND5P	L	M	H
			Summer	COASTAL OAK WOODLAND5M		M	H
			Summer	COASTAL OAK WOODLAND5D		M	H
			Migrant	COASTAL SCRUB4M			L
			Migrant	MIXED CHAPARRAL4M		L	L
			Migrant	MIXED CHAPARRAL4D	L	L	L
			Summer	URBANI	L	L	H
			Summer	CLOSED-CONE PINE-CYPRESS5M		L	L
			Summer	CLOSED-CONE PINE-CYPRESS5D		L	L
			Summer	VALLEY FOOTHILL RIPARIAN5P	L	M	H
			Summer	VALLEY FOOTHILL RIPARIAN5M	L	M	H
			Summer	VALLEY FOOTHILL RIPARIAN5D	L	M	H
B461	COMMON YELLOWTHROAT	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	ANNUAL GRASSID	M	H	H
			Yearlong	FRESH EMERGENT WETLAND2M	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2D	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	L	L	L
B467	YELLOW-BREASTED CHAT	7					
			Summer	SAN LUIS OBISPO			
			Migrant	COASTAL SCRUB3D		L	L
			Migrant	COASTAL SCRUB4M			L
			Migrant	COASTAL SCRUB4D			L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	L	M	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	L	M	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	L	M	H
B469	SUMMER TANAGER	7					
			Migrant	SAN LUIS OBISPO			
			Summer	VALLEY FOOTHILL RIPARIAN5P	M	M	H
			Summer	VALLEY FOOTHILL RIPARIAN5M	H	H	H
			Summer	VALLEY FOOTHILL RIPARIAN5D	H	H	H
B483	SPOTTED TOWHEE	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S		H	H
			Yearlong	COASTAL OAK WOODLAND5P		M	H
			Yearlong	COASTAL OAK WOODLAND5M		L	H
			Yearlong	COASTAL SCRUB2S	L	L	M
			Yearlong	COASTAL SCRUB3D	L	L	L
			Yearlong	COASTAL SCRUB4M	M	M	M
			Yearlong	COASTAL SCRUB4D	L	L	L
			Yearlong	MIXED CHAPARRAL4M		M	M
			Yearlong	MIXED CHAPARRAL4D		L	L

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
			Yearlong	URBANI	H	H	H
			Yearlong	CLOSED-CONE PINE-CYPRESS5M		L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	L	L	M
			Summer	VALLEY FOOTHILL RIPARIAN5D	M	M	M
B484	CALIFORNIA TOWHEE	2 3					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	L	L	M
			Yearlong	COASTAL OAK WOODLAND5P	L	L	L
			Yearlong	COASTAL SCRUB2S	H	H	H
			Yearlong	COASTAL SCRUB4M		L	H
			Yearlong	MIXED CHAPARRAL4M	M	M	M
			Yearlong	MIXED CHAPARRAL4D	M	M	M
			Yearlong	URBANI	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	L	L	L
B487	RUFOUS-CROWNED SPARROW	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL SCRUB	M	M	H
			Yearlong	COASTAL SCRUB2S	H	H	H
			Yearlong	COASTAL SCRUB3D		L	L
			Yearlong	COASTAL SCRUB4M	M	M	M
			Yearlong	MIXED CHAPARRAL4M	M	M	M
			Yearlong	ANNUAL GRASSID	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5P		L	L
B497	SAGE SPARROW	2 7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL SCRUB		L	M
			Yearlong	COASTAL SCRUB2S		L	M
			Yearlong	COASTAL SCRUB3D	H	H	H
			Yearlong	COASTAL SCRUB4M	M	M	H
			Yearlong	MIXED CHAPARRAL4M	M	M	M
			Yearlong	ANNUAL GRASSID	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5P		L	L
B499	SAVANNAH SPARROW	3 7					
			Yearlong	SAN LUIS OBISPO			
			Winter	COASTAL OAK WOODLAND5S		M	H
			Yearlong	COASTAL SCRUB		M	H
			Yearlong	COASTAL SCRUB2S		M	H
			Yearlong	ANNUAL GRASSID	H	H	H
B505	SONG SPARROW	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	L	L	L
			Yearlong	COASTAL OAK WOODLAND5P	L	L	L
			Yearlong	COASTAL SCRUB	M	M	M
			Yearlong	COASTAL SCRUB2S	M	M	M
			Yearlong	COASTAL SCRUB4M	L	L	L
			Yearlong	MIXED CHAPARRAL4M		L	L
			Yearlong	MIXED CHAPARRAL4D		L	L
			Yearlong	FRESH EMERGENT WETLAND2M	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2D	H	H	H
			Yearlong	URBANI	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	L	L	L
B512	DARK-EYED JUNCO	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	H	H	H

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
			Yearlong	COASTAL OAK WOODLAND5P	H	H	H
			Yearlong	COASTAL OAK WOODLAND5M	M	M	M
			Yearlong	COASTAL OAK WOODLAND5D	L	L	M
			Winter	COASTAL SCRUB			L
			Winter	COASTAL SCRUB2S		L	L
			Winter	COASTAL SCRUB3D		L	L
			Winter	COASTAL SCRUB4M		L	L
			Winter	COASTAL SCRUB4D		L	L
			Yearlong	MIXED CHAPARRAL4M	L	L	L
			Yearlong	MIXED CHAPARRAL4D	L	L	L
			Yearlong	URBANI	L	H	H
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	M	M	M
			Yearlong	CLOSED-CONE PINE-CYPRESS5D	L	L	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	L	L	M
B520	TRICOLORED BLACKBIRD	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	ANNUAL GRASSID			H
			Yearlong	FRESH EMERGENT WETLAND2M	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2D	H	H	H
			Yearlong	URBANI			M
			Yearlong	IRRIGATED ROW AND FIELD CRO			H
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	L	L	L
M601	VIRGINIA OPOSSUM	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	M	M	M
			Yearlong	COASTAL OAK WOODLAND5P	M	M	M
			Yearlong	COASTAL OAK WOODLAND5M	M	M	M
			Yearlong	COASTAL OAK WOODLAND5D	L	L	L
			Yearlong	COASTAL SCRUB	L	L	M
			Yearlong	COASTAL SCRUB2S	L	L	M
			Yearlong	COASTAL SCRUB3D	L	L	L
			Yearlong	COASTAL SCRUB4M	L	L	L
			Yearlong	COASTAL SCRUB4D	L	L	L
			Yearlong	MIXED CHAPARRAL4M	L	L	L
			Yearlong	MIXED CHAPARRAL4D	L	L	L
			Yearlong	ANNUAL GRASSID	M	M	M
			Yearlong	FRESH EMERGENT WETLAND2M	M	M	M
			Yearlong	FRESH EMERGENT WETLAND2D	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	H	H	H
M006	ORNATE SHREW	7 10					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	L	L	L
			Yearlong	COASTAL OAK WOODLAND5P	L	L	L
			Yearlong	COASTAL OAK WOODLAND5M	M	M	M
			Yearlong	COASTAL OAK WOODLAND5D	M	M	M
			Yearlong	COASTAL SCRUB	L	L	L
			Yearlong	COASTAL SCRUB2S	L	L	L
			Yearlong	COASTAL SCRUB3D	L	L	L
			Yearlong	COASTAL SCRUB4M	L	L	L
			Yearlong	COASTAL SCRUB4D	L	L	L
			Yearlong	MIXED CHAPARRAL4M	L	L	L
			Yearlong	MIXED CHAPARRAL4D	L	L	L
			Yearlong	ANNUAL GRASSID	M	M	M
			Yearlong	FRESH EMERGENT WETLAND2M	M	M	M
			Yearlong	FRESH EMERGENT WETLAND2D	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	H	H	H

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	H	H	H
M018	BROAD-FOOTED MOLE	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	L	L	L
			Yearlong	COASTAL OAK WOODLAND5P	L	L	L
			Yearlong	COASTAL SCRUB	L	L	L
			Yearlong	COASTAL SCRUB2S	L	L	L
			Yearlong	COASTAL SCRUB3D	L	L	L
			Yearlong	COASTAL SCRUB4M	L	L	L
			Yearlong	COASTAL SCRUB4D	L	L	L
			Yearlong	ANNUAL GRASSID	H	H	H
			Yearlong	IRRIGATED ROW AND FIELD CRO	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	M	M	M
M023	YUMA MYOTIS	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	H	H	H
			Yearlong	COASTAL OAK WOODLAND5P	H	H	H
			Yearlong	COASTAL OAK WOODLAND5M	H	H	H
			Yearlong	COASTAL OAK WOODLAND5D	H	H	H
			Yearlong	COASTAL SCRUB			H
			Yearlong	COASTAL SCRUB2S			H
			Yearlong	COASTAL SCRUB3D			H
			Yearlong	COASTAL SCRUB4M			H
			Yearlong	COASTAL SCRUB4D			H
			Yearlong	MIXED CHAPARRAL4M			M
			Yearlong	MIXED CHAPARRAL4D			M
			Yearlong	ANNUAL GRASSID			M
			Yearlong	FRESH EMERGENT WETLAND2M			L
			Yearlong	FRESH EMERGENT WETLAND2D			L
			Yearlong	URBANI	M	M	M
			Yearlong	IRRIGATED ROW AND FIELD CRO			L
			Yearlong	CLOSED-CONE PINE-CYPRESS5M			L
			Yearlong	CLOSED-CONE PINE-CYPRESS5D			L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P			H
			Yearlong	VALLEY FOOTHILL RIPARIAN5M			H
			Yearlong	VALLEY FOOTHILL RIPARIAN5D			H
M037	TOWNSEND'S BIG-EARED BAT	7 12					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	M	M	M
			Yearlong	COASTAL OAK WOODLAND5P	M	M	M
			Yearlong	COASTAL OAK WOODLAND5M	L	L	L
			Yearlong	COASTAL OAK WOODLAND5D	L	L	L
			Yearlong	COASTAL SCRUB			M
			Yearlong	COASTAL SCRUB2S			M
			Yearlong	COASTAL SCRUB3D			M
			Yearlong	COASTAL SCRUB4M			M
			Yearlong	COASTAL SCRUB4D			M
			Yearlong	MIXED CHAPARRAL4M			L
			Yearlong	MIXED CHAPARRAL4D			L
			Yearlong	ANNUAL GRASSID			L
			Yearlong	URBANI	L	L	L
			Yearlong	IRRIGATED ROW AND FIELD CRO			L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P			M
			Yearlong	VALLEY FOOTHILL RIPARIAN5M			L
			Yearlong	VALLEY FOOTHILL RIPARIAN5D			L
M038	PALLID BAT	7 12					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	M	M	H

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
			Yearlong	COASTAL OAK WOODLAND5P	M	M	H
			Yearlong	COASTAL OAK WOODLAND5M	M	M	H
			Yearlong	COASTAL OAK WOODLAND5D	M	M	M
			Yearlong	COASTAL SCRUB	M	M	M
			Yearlong	COASTAL SCRUB2S	M	M	M
			Yearlong	COASTAL SCRUB3D	M	M	M
			Yearlong	COASTAL SCRUB4M	M	M	M
			Yearlong	MIXED CHAPARRAL4M	M	M	M
			Yearlong	MIXED CHAPARRAL4D	M	M	M
			Yearlong	ANNUAL GRASSID			H
			Summer	URBANI	M	M	L
			Yearlong	IRRIGATED ROW AND FIELD CRO			L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P			M
			Yearlong	VALLEY FOOTHILL RIPARIAN5M			M
			Yearlong	VALLEY FOOTHILL RIPARIAN5D			M
M042	WESTERN MASTIFF BAT	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	M	M	M
			Yearlong	COASTAL OAK WOODLAND5P	L	L	L
			Yearlong	COASTAL OAK WOODLAND5M	L	L	L
			Yearlong	COASTAL SCRUB			H
			Yearlong	COASTAL SCRUB2S			H
			Yearlong	COASTAL SCRUB3D			M
			Yearlong	COASTAL SCRUB4M			M
			Yearlong	MIXED CHAPARRAL4M			M
			Yearlong	MIXED CHAPARRAL4D			M
			Yearlong	ANNUAL GRASSID			H
			Yearlong	FRESH EMERGENT WETLAND2M			H
			Yearlong	FRESH EMERGENT WETLAND2D			H
			Yearlong	URBANI			M
			Yearlong	IRRIGATED ROW AND FIELD CRO			M
			Yearlong	CLOSED-CONE PINE-CYPRESS5M			L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P			M
			Yearlong	VALLEY FOOTHILL RIPARIAN5M			L
			Yearlong	VALLEY FOOTHILL RIPARIAN5D			L
M045	BRUSH RABBIT	3 8 14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	L	L	L
			Yearlong	COASTAL OAK WOODLAND5P	L	L	L
			Yearlong	COASTAL SCRUB	M	M	H
			Yearlong	COASTAL SCRUB2S	M	M	H
			Yearlong	COASTAL SCRUB3D	H	H	L
			Yearlong	COASTAL SCRUB4M	M	M	M
			Yearlong	COASTAL SCRUB4D	M	M	L
			Yearlong	MIXED CHAPARRAL4M	M	M	M
			Yearlong	MIXED CHAPARRAL4D	M	M	L
			Yearlong	ANNUAL GRASSID	L	L	H
			Yearlong	URBANI	H	H	H
			Yearlong	IRRIGATED ROW AND FIELD CRO	L	M	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	L	L	L
M047	DESERT COTTONTAIL	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL SCRUB	L	L	H
			Yearlong	COASTAL SCRUB2S	L	L	H
			Yearlong	COASTAL SCRUB3D	H	H	L
			Yearlong	COASTAL SCRUB4M	M	M	M
			Yearlong	COASTAL SCRUB4D	M	M	L
			Yearlong	MIXED CHAPARRAL4M	M	M	M
			Yearlong	MIXED CHAPARRAL4D	M	M	L
			Yearlong	ANNUAL GRASSID	M	M	M
			Yearlong	URBANI	H	H	H
			Yearlong	IRRIGATED ROW AND FIELD CRO	L	M	H

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
M051	BLACK-TAILED JACKRABBIT	7 14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	L	L	L
			Yearlong	COASTAL OAK WOODLAND5P	L	L	L
			Yearlong	COASTAL SCRUB	H	H	H
			Yearlong	COASTAL SCRUB2S	M	M	H
			Yearlong	COASTAL SCRUB3D	L	L	
			Yearlong	COASTAL SCRUB4M	M	M	M
			Yearlong	COASTAL SCRUB4D	L	L	
			Yearlong	MIXED CHAPARRAL4M	M	M	L
			Yearlong	MIXED CHAPARRAL4D	L	L	
			Yearlong	ANNUAL GRASSID		L	H
			Yearlong	URBANI	L	L	L
			Yearlong	IRRIGATED ROW AND FIELD CRO	M	M	H
M068	SAN JOAQUIN ANTELOPE SQUIRREL	4					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	ANNUAL GRASSID	M	M	H
M077	WESTERN GRAY SQUIRREL	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	M	M	H
			Yearlong	COASTAL OAK WOODLAND5P	M	M	H
			Yearlong	COASTAL OAK WOODLAND5M	H	H	H
			Yearlong	COASTAL OAK WOODLAND5D	H	H	H
			Yearlong	MIXED CHAPARRAL4M			L
			Yearlong	MIXED CHAPARRAL4D			L
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	M	M	M
			Yearlong	CLOSED-CONE PINE-CYPRESS5D	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	H	H	H
M087	SAN JOAQUIN POCKET MOUSE	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	M	M	M
			Yearlong	COASTAL OAK WOODLAND5P	L	L	L
			Yearlong	ANNUAL GRASSID	H	H	H
M095	CALIFORNIA POCKET MOUSE	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	L	L	L
			Yearlong	COASTAL OAK WOODLAND5P	L	L	L
			Yearlong	COASTAL OAK WOODLAND5M	L	L	L
			Yearlong	COASTAL OAK WOODLAND5D	L	L	L
			Yearlong	COASTAL SCRUB	M	M	M
			Yearlong	COASTAL SCRUB2S	M	M	M
			Yearlong	COASTAL SCRUB3D	H	H	H
			Yearlong	COASTAL SCRUB4M	H	H	H
			Yearlong	COASTAL SCRUB4D	H	H	H
			Yearlong	MIXED CHAPARRAL4M	H	H	H
			Yearlong	MIXED CHAPARRAL4D	L	L	L
			Yearlong	ANNUAL GRASSID	H	H	H
M104	HEERMANN'S KANGAROO RAT	1 3 5					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	L	L	L
			Yearlong	COASTAL OAK WOODLAND5P	L	L	L
			Yearlong	COASTAL SCRUB	M	M	M
			Yearlong	COASTAL SCRUB2S	M	M	M
			Yearlong	COASTAL SCRUB4M	L	L	L
			Yearlong	MIXED CHAPARRAL4M	L	L	L
			Yearlong	MIXED CHAPARRAL4D	L	L	L
			Yearlong	ANNUAL GRASSID	L	L	L

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
M106	GIANT KANGAROO RAT	1 3					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	ANNUAL GRASSID	L	L	L
M112	AMERICAN BEAVER	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	ANNUAL GRASSID			L
			Yearlong	FRESH EMERGENT WETLAND2M	M	M	H
			Yearlong	FRESH EMERGENT WETLAND2D	M	M	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	M	M	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	M	M	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	M	M	H
M117	DEER MOUSE	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	M	M	M
			Yearlong	COASTAL OAK WOODLAND5P	M	M	M
			Yearlong	COASTAL OAK WOODLAND5M	M	M	M
			Yearlong	COASTAL OAK WOODLAND5D	L	L	L
			Yearlong	COASTAL SCRUB	M	M	M
			Yearlong	COASTAL SCRUB2S	M	M	M
			Yearlong	COASTAL SCRUB3D	H	H	H
			Yearlong	COASTAL SCRUB4M	H	H	H
			Yearlong	COASTAL SCRUB4D	H	H	H
			Yearlong	MIXED CHAPARRAL4M	H	H	H
			Yearlong	MIXED CHAPARRAL4D	H	H	H
			Yearlong	ANNUAL GRASSID	M	M	M
			Yearlong	FRESH EMERGENT WETLAND2M	M	M	M
			Yearlong	FRESH EMERGENT WETLAND2D	M	M	M
			Yearlong	URBANI	M	M	M
			Yearlong	IRRIGATED ROW AND FIELD CRO	L	M	M
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	M	M	M
			Yearlong	CLOSED-CONE PINE-CYPRESS5D	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	L	L	L
M122	SOUTHERN GRASSHOPPER MOUSE	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL SCRUB	M	M	M
			Yearlong	COASTAL SCRUB2S	M	M	M
			Yearlong	COASTAL SCRUB3D	L	L	L
			Yearlong	COASTAL SCRUB4M	M	M	M
			Yearlong	COASTAL SCRUB4D	L	L	L
			Yearlong	MIXED CHAPARRAL4M	M	M	M
			Yearlong	MIXED CHAPARRAL4D	L	L	L
			Yearlong	ANNUAL GRASSID	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	L	L	L
M126	DESERT WOODRAT	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL SCRUB	L	L	L
			Yearlong	COASTAL SCRUB2S	L	L	L
			Yearlong	COASTAL SCRUB3D	H	H	H
			Yearlong	COASTAL SCRUB4M	H	H	H
			Yearlong	COASTAL SCRUB4D	H	H	H
			Yearlong	MIXED CHAPARRAL4M	H	H	H
			Yearlong	MIXED CHAPARRAL4D	H	H	H
M127	DUSKY-FOOTED WOODRAT	7 10					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	M	M	M
			Yearlong	COASTAL OAK WOODLAND5P	L	L	L

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
			Yearlong	COASTAL OAK WOODLAND5M	L	L	L
			Yearlong	COASTAL OAK WOODLAND5D	L	L	L
			Yearlong	COASTAL SCRUB	L	L	L
			Yearlong	COASTAL SCRUB2S	L	L	L
			Yearlong	COASTAL SCRUB3D	H	H	H
			Yearlong	COASTAL SCRUB4M	H	H	H
			Yearlong	COASTAL SCRUB4D	H	H	H
			Yearlong	MIXED CHAPARRAL4M	H	H	H
			Yearlong	MIXED CHAPARRAL4D	H	H	H
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	M	M	M
			Yearlong	CLOSED-CONE PINE-CYPRESS5D	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	L	L	L
M134	CALIFORNIA VOLE	1 3 7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	L	L	L
			Yearlong	COASTAL OAK WOODLAND5P	L	L	L
			Yearlong	COASTAL OAK WOODLAND5M	L	L	L
			Yearlong	COASTAL SCRUB	M	M	M
			Yearlong	COASTAL SCRUB2S	M	M	M
			Yearlong	COASTAL SCRUB4M	L	L	L
			Yearlong	ANNUAL GRASSID	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2M	M	M	M
			Yearlong	FRESH EMERGENT WETLAND2D	M	M	M
			Yearlong	URBANI	M	M	M
			Yearlong	IRRIGATED ROW AND FIELD CRO	L	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	L	L	L
M139	COMMON MUSKRAT	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	FRESH EMERGENT WETLAND2M	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2D	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	H	H	H
M146	COYOTE	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	L	M	M
			Yearlong	COASTAL OAK WOODLAND5P	M	M	M
			Yearlong	COASTAL OAK WOODLAND5M	L	L	L
			Yearlong	COASTAL OAK WOODLAND5D	L	L	L
			Yearlong	COASTAL SCRUB	M	M	H
			Yearlong	COASTAL SCRUB2S	M	M	H
			Yearlong	COASTAL SCRUB3D	H	H	M
			Yearlong	COASTAL SCRUB4M	M	M	M
			Yearlong	MIXED CHAPARRAL4M	M	M	L
			Yearlong	MIXED CHAPARRAL4D	M	M	L
			Yearlong	ANNUAL GRASSID	L	L	H
			Yearlong	FRESH EMERGENT WETLAND2M			M
			Yearlong	FRESH EMERGENT WETLAND2D			M
			Yearlong	URBANI	L	L	H
			Yearlong	IRRIGATED ROW AND FIELD CRO	L	L	M
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	L	L	L
			Yearlong	CLOSED-CONE PINE-CYPRESS5D	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	L	L	L
M147	RED FOX	4 12 14					
			Yearlong	SAN LUIS OBISPO			

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
			Yearlong	MIXED CHAPARRAL4M	L	L	
			Yearlong	MIXED CHAPARRAL4D	L	L	
			Yearlong	ANNUAL GRASSID			L
			Yearlong	IRRIGATED ROW AND FIELD CRO	L	L	M
M148	KIT FOX	1 4					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	L	L	L
			Yearlong	ANNUAL GRASSID	M	M	M
M149	GRAY FOX	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	L	L	M
			Yearlong	COASTAL OAK WOODLAND5P	L	L	L
			Yearlong	COASTAL OAK WOODLAND5M	L	L	L
			Yearlong	COASTAL SCRUB			M
			Yearlong	COASTAL SCRUB2S	L	L	M
			Yearlong	COASTAL SCRUB3D	H	H	M
			Yearlong	COASTAL SCRUB4M	H	H	M
			Yearlong	COASTAL SCRUB4D	H	H	M
			Yearlong	MIXED CHAPARRAL4M	H	H	M
			Yearlong	MIXED CHAPARRAL4D	H	H	M
			Yearlong	ANNUAL GRASSID			M
			Yearlong	FRESH EMERGENT WETLAND2M	L	L	H
			Yearlong	FRESH EMERGENT WETLAND2D	L	L	H
			Yearlong	URBANI	L	L	L
			Yearlong	IRRIGATED ROW AND FIELD CRO		L	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	L	L	
M151	BLACK BEAR	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL SCRUB			L
			Yearlong	COASTAL SCRUB2S	L	L	L
			Yearlong	COASTAL SCRUB3D	L	L	L
			Yearlong	COASTAL SCRUB4M	L	L	M
			Yearlong	COASTAL SCRUB4D	L	L	L
			Yearlong	MIXED CHAPARRAL4M	L	L	M
			Yearlong	MIXED CHAPARRAL4D	L	L	L
			Yearlong	ANNUAL GRASSID			H
			Yearlong	IRRIGATED ROW AND FIELD CRO			L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	M	M	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	H	H	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	M	M	L
M153	RACCOON	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	M	M	M
			Yearlong	COASTAL OAK WOODLAND5P	M	M	M
			Yearlong	COASTAL OAK WOODLAND5M	H	H	M
			Yearlong	COASTAL OAK WOODLAND5D	H	H	M
			Yearlong	COASTAL SCRUB		L	L
			Yearlong	COASTAL SCRUB2S	L	L	L
			Yearlong	COASTAL SCRUB3D	L	M	L
			Yearlong	COASTAL SCRUB4M	M	M	M
			Yearlong	COASTAL SCRUB4D	L	M	L
			Yearlong	MIXED CHAPARRAL4M	M	M	M
			Yearlong	MIXED CHAPARRAL4D	L	M	L
			Yearlong	ANNUAL GRASSID			L
			Yearlong	FRESH EMERGENT WETLAND2M		L	H
			Yearlong	FRESH EMERGENT WETLAND2D		L	M
			Yearlong	URBANI	M	M	M
			Yearlong	IRRIGATED ROW AND FIELD CRO		L	M
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	H	L	M
			Yearlong	CLOSED-CONE PINE-CYPRESS5D	H	M	L

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
			Yearlong	MARINE4G			L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	H	H	M
M157	LONG-TAILED WEASEL	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	L	L	M
			Yearlong	COASTAL OAK WOODLAND5P	M	M	L
			Yearlong	COASTAL OAK WOODLAND5M	L	L	L
			Yearlong	COASTAL OAK WOODLAND5D	L	L	L
			Yearlong	COASTAL SCRUB	L	L	M
			Yearlong	COASTAL SCRUB2S	L	L	M
			Yearlong	COASTAL SCRUB3D	L	L	L
			Yearlong	COASTAL SCRUB4M	L	L	M
			Yearlong	COASTAL SCRUB4D	L	L	L
			Yearlong	MIXED CHAPARRAL4M	L	L	M
			Yearlong	MIXED CHAPARRAL4D	L	L	L
			Yearlong	ANNUAL GRASSID	L	L	H
			Yearlong	URBANI	L	L	L
			Yearlong	IRRIGATED ROW AND FIELD CRO	L	L	M
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	L	L	L
			Yearlong	CLOSED-CONE PINE-CYPRESS5D	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	L	L	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	M	M	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	M	M	L
M160	AMERICAN BADGER	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL SCRUB	M	M	M
			Yearlong	COASTAL SCRUB2S	M	M	M
			Yearlong	MIXED CHAPARRAL4M	L	L	L
			Yearlong	ANNUAL GRASSID	H	H	H
			Yearlong	IRRIGATED ROW AND FIELD CRO	L	L	M
M161	WESTERN SPOTTED SKUNK	7 14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	M	M	M
			Yearlong	COASTAL OAK WOODLAND5P	L	L	L
			Yearlong	COASTAL OAK WOODLAND5M	L	L	L
			Yearlong	COASTAL SCRUB	L	L	M
			Yearlong	COASTAL SCRUB2S	M	M	M
			Yearlong	COASTAL SCRUB3D	H	H	H
			Yearlong	COASTAL SCRUB4M	H	H	H
			Yearlong	COASTAL SCRUB4D	H	H	H
			Yearlong	MIXED CHAPARRAL4M	H	H	H
			Yearlong	MIXED CHAPARRAL4D	H	H	H
			Yearlong	ANNUAL GRASSID	L	L	M
			Yearlong	URBANI	L	L	L
			Yearlong	IRRIGATED ROW AND FIELD CRO		L	M
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	L	L	L
M162	STRIPED SKUNK	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	L	L	L
			Yearlong	COASTAL OAK WOODLAND5P	L	L	M
			Yearlong	COASTAL OAK WOODLAND5M	L	L	L
			Yearlong	COASTAL OAK WOODLAND5D	L	L	L
			Yearlong	COASTAL SCRUB	M	M	H
			Yearlong	COASTAL SCRUB2S	M	M	H
			Yearlong	COASTAL SCRUB3D	L	L	M
			Yearlong	COASTAL SCRUB4M	H	H	M
			Yearlong	COASTAL SCRUB4D	L	L	L

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
			Yearlong	MIXED CHAPARRAL4M	H	H	M
			Yearlong	MIXED CHAPARRAL4D	L	L	L
			Yearlong	ANNUAL GRASSID	L	L	H
			Yearlong	FRESH EMERGENT WETLAND2M	M	M	H
			Yearlong	FRESH EMERGENT WETLAND2D	M	M	H
			Yearlong	URBANI	L	M	M
			Yearlong	IRRIGATED ROW AND FIELD CRO		L	H
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	L	L	L
			Yearlong	CLOSED-CONE PINE-CYPRESS5D	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	L	L	L
M165	MOUNTAIN LION	5 7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	L	L	M
			Yearlong	COASTAL OAK WOODLAND5P	M	M	M
			Yearlong	COASTAL OAK WOODLAND5M	M	M	M
			Yearlong	COASTAL OAK WOODLAND5D	M	M	M
			Yearlong	COASTAL SCRUB			M
			Yearlong	COASTAL SCRUB2S	L	L	M
			Yearlong	COASTAL SCRUB3D	M	M	H
			Yearlong	COASTAL SCRUB4M	M	M	H
			Yearlong	COASTAL SCRUB4D	M	M	H
			Yearlong	MIXED CHAPARRAL4M	H	H	H
			Yearlong	MIXED CHAPARRAL4D	H	H	M
			Yearlong	ANNUAL GRASSID	L	L	L
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	L	L	
			Yearlong	CLOSED-CONE PINE-CYPRESS5D	L	L	
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	H	H	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	M	M	M
M166	BOBCAT	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	M	M	M
			Yearlong	COASTAL OAK WOODLAND5P	M	M	L
			Yearlong	COASTAL OAK WOODLAND5M	L	L	L
			Yearlong	COASTAL OAK WOODLAND5D	L	L	L
			Yearlong	COASTAL SCRUB	L	L	M
			Yearlong	COASTAL SCRUB2S	L	L	H
			Yearlong	COASTAL SCRUB3D	H	H	M
			Yearlong	COASTAL SCRUB4M	H	H	M
			Yearlong	COASTAL SCRUB4D	H	H	M
			Yearlong	MIXED CHAPARRAL4M	H	H	M
			Yearlong	MIXED CHAPARRAL4D	H	H	M
			Yearlong	ANNUAL GRASSID	L	L	M
			Yearlong	FRESH EMERGENT WETLAND2M	L	L	M
			Yearlong	FRESH EMERGENT WETLAND2D	L	L	M
			Yearlong	IRRIGATED ROW AND FIELD CRO			M
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	L	L	L
			Yearlong	CLOSED-CONE PINE-CYPRESS5D	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	M	M	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	L	L	L
M169	NORTHERN SEA-LION	2 6					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	MARINE4G	H	H	
			Yearlong	MARINE4R	H	H	
M170	CALIFORNIA SEA-LION	6					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	MARINE4G	H	H	
			Yearlong	MARINE4R	H	H	

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
M171	HARBOR SEAL	6					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	MARINE4G	H	H	
			Yearlong	MARINE4R	H	H	
M173	NORTHERN ELEPHANT SEAL	5 6					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	MARINE4G	H	H	
			Yearlong	MARINE4R	M	M	
M176	WILD PIG	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	L	L	L
			Yearlong	COASTAL OAK WOODLAND5P	M	M	M
			Yearlong	COASTAL OAK WOODLAND5M	H	H	H
			Yearlong	COASTAL OAK WOODLAND5D	M	M	H
			Yearlong	COASTAL SCRUB			M
			Yearlong	COASTAL SCRUB2S			M
			Yearlong	COASTAL SCRUB3D	H	H	H
			Yearlong	COASTAL SCRUB4M	H	H	H
			Yearlong	COASTAL SCRUB4D	H	H	H
			Yearlong	MIXED CHAPARRAL4M	H	H	H
			Yearlong	MIXED CHAPARRAL4D	H	H	H
			Yearlong	ANNUAL GRASSID			M
			Yearlong	IRRIGATED ROW AND FIELD CRO			H
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	M	M	M
			Yearlong	CLOSED-CONE PINE-CYPRESS5D	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	M	M	H
M177	ELK	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	L	M	M
			Yearlong	COASTAL OAK WOODLAND5P	L	L	L
			Yearlong	COASTAL OAK WOODLAND5M	L	L	L
			Yearlong	COASTAL OAK WOODLAND5D	L	L	L
			Yearlong	COASTAL SCRUB	L	L	H
			Yearlong	COASTAL SCRUB2S	L	L	H
			Yearlong	COASTAL SCRUB3D		L	
			Yearlong	COASTAL SCRUB4M	L	L	M
			Yearlong	COASTAL SCRUB4D		L	
			Yearlong	MIXED CHAPARRAL4M	M	M	M
			Yearlong	MIXED CHAPARRAL4D		L	
			Yearlong	ANNUAL GRASSID		L	L
			Yearlong	FRESH EMERGENT WETLAND2M	M	M	H
			Yearlong	FRESH EMERGENT WETLAND2D	M	M	H
			Yearlong	URBANI			M
			Yearlong	IRRIGATED ROW AND FIELD CRO			H
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	L	L	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5M		L	
			Yearlong	VALLEY FOOTHILL RIPARIAN5D			M
M178	FALLOW DEAR	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	M	L	M
			Yearlong	COASTAL OAK WOODLAND5P	M	L	M
			Yearlong	COASTAL OAK WOODLAND5M	M	M	L
			Yearlong	COASTAL OAK WOODLAND5D	M	H	L
			Yearlong	COASTAL SCRUB	H	L	H
			Yearlong	COASTAL SCRUB2S	H	L	H
			Yearlong	COASTAL SCRUB3D	M	H	L
			Yearlong	COASTAL SCRUB4M	M	M	L
			Yearlong	COASTAL SCRUB4D	M	H	L
			Yearlong	MIXED CHAPARRAL4M	M	M	L

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
			Yearlong	MIXED CHAPARRAL4D	M	H	L
			Yearlong	ANNUAL GRASSID	H	L	M
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	M	M	L
			Yearlong	CLOSED-CONE PINE-CYPRESS5D	M	H	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	M	L	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	M	M	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	M	H	L
M179	SAMBAR DEAR	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	L	L	L
			Yearlong	COASTAL OAK WOODLAND5P	L	L	L
			Yearlong	COASTAL OAK WOODLAND5M	M	M	M
			Yearlong	COASTAL OAK WOODLAND5D	M	M	M
			Yearlong	ANNUAL GRASSID			M
M181	MULE DEER	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	M	M	M
			Yearlong	COASTAL OAK WOODLAND5P	M	M	M
			Yearlong	COASTAL OAK WOODLAND5M	M	M	L
			Yearlong	COASTAL OAK WOODLAND5D	M	M	M
			Yearlong	COASTAL SCRUB	L	L	M
			Yearlong	COASTAL SCRUB2S	L	L	H
			Yearlong	COASTAL SCRUB3D	M	M	M
			Yearlong	COASTAL SCRUB4M	M	H	L
			Yearlong	COASTAL SCRUB4D	L	M	L
			Yearlong	MIXED CHAPARRAL4M	M	M	L
			Yearlong	MIXED CHAPARRAL4D	L	M	L
			Yearlong	ANNUAL GRASSID			M
			Yearlong	FRESH EMERGENT WETLAND2M		L	L
			Yearlong	FRESH EMERGENT WETLAND2D		L	L
			Yearlong	URBANI	L	L	M
			Yearlong	IRRIGATED ROW AND FIELD CRO			M
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	L	L	L
			Yearlong	CLOSED-CONE PINE-CYPRESS5D	L	M	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	L	H	L
M182	PRONGHORN	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	ANNUAL GRASSID	H	H	H
M184	BARBARY SHEEP	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	M	M	M
			Yearlong	COASTAL OAK WOODLAND5P	M	M	M
			Yearlong	COASTAL OAK WOODLAND5M	M	M	M
			Yearlong	COASTAL OAK WOODLAND5D	M	M	M
			Yearlong	COASTAL SCRUB	L	L	L
			Yearlong	COASTAL SCRUB2S	L	L	L
			Yearlong	COASTAL SCRUB3D	L	L	L
			Yearlong	COASTAL SCRUB4M	L	L	L
			Yearlong	COASTAL SCRUB4D	L	L	L
			Yearlong	ANNUAL GRASSID			M
M186	FERAL GOAT	14					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	M	M	M
			Yearlong	COASTAL OAK WOODLAND5P	M	M	M
			Yearlong	COASTAL OAK WOODLAND5M	M	M	M
			Yearlong	COASTAL OAK WOODLAND5D	M	M	M
			Yearlong	COASTAL SCRUB			L
			Yearlong	COASTAL SCRUB2S			L

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
			Yearlong	COASTAL SCRUB3D	L	L	L
			Yearlong	COASTAL SCRUB4M	L	L	L
			Yearlong	COASTAL SCRUB4D	L	L	L
			Yearlong	MIXED CHAPARRAL4M	L	L	L
			Yearlong	MIXED CHAPARRAL4D	L	L	L
			Yearlong	ANNUAL GRASSID			H
			Yearlong	VALLEY FOOTHILL RIPARIAN5P		L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5M		L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5D		L	L
R004	WESTERN POND TURTLE	6 7 12					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	H	H	H
			Yearlong	COASTAL OAK WOODLAND5P	H	H	H
			Yearlong	COASTAL OAK WOODLAND5M	H	H	H
			Yearlong	COASTAL OAK WOODLAND5D	H	H	H
			Summer	COASTAL SCRUB	L	L	L
			Summer	COASTAL SCRUB2S	L	L	L
			Summer	COASTAL SCRUB3D	M	M	M
			Summer	COASTAL SCRUB4M	M	M	M
			Summer	COASTAL SCRUB4D	M	M	M
			Summer	MIXED CHAPARRAL4M	L	L	L
			Summer	MIXED CHAPARRAL4D	L	L	L
			Summer	ANNUAL GRASSID	M	M	M
			Yearlong	FRESH EMERGENT WETLAND2M	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2D	H	H	H
			Yearlong	URBANI	L		
			Summer	CLOSED-CONE PINE-CYPRESS5M	L	L	L
			Summer	CLOSED-CONE PINE-CYPRESS5D	L	L	L
			Summer	VALLEY FOOTHILL RIPARIAN5P	H	H	H
			Summer	VALLEY FOOTHILL RIPARIAN5M	H	H	H
			Summer	VALLEY FOOTHILL RIPARIAN5D	H	H	H
R029	COAST HORNED LIZARD	6 7 12					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	M	M	M
			Yearlong	COASTAL OAK WOODLAND5P	L	L	L
			Yearlong	COASTAL OAK WOODLAND5M	L	L	L
			Yearlong	COASTAL SCRUB	M	M	M
			Yearlong	COASTAL SCRUB2S	M	M	M
			Yearlong	COASTAL SCRUB4M	L	M	L
			Yearlong	MIXED CHAPARRAL4M	L	M	L
			Yearlong	IRRIGATED ROW AND FIELD CRO	L	L	L
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	L	L	L
R034	DESERT NIGHT LIZARD	7 12					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	ANNUAL GRASSID	L	L	L
R036	WESTERN SKINK	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	H	H	H
			Yearlong	COASTAL OAK WOODLAND5P	H	H	H
			Yearlong	COASTAL OAK WOODLAND5M	H	H	H
			Yearlong	COASTAL OAK WOODLAND5D	M	M	M
			Yearlong	COASTAL SCRUB	M	M	M
			Yearlong	COASTAL SCRUB2S	M	M	M
			Yearlong	COASTAL SCRUB3D	L	L	L
			Yearlong	COASTAL SCRUB4M	M	M	M
			Yearlong	COASTAL SCRUB4D	L	L	L
			Yearlong	MIXED CHAPARRAL4M	M	M	M
			Yearlong	ANNUAL GRASSID	L	L	L
			Yearlong	IRRIGATED ROW AND FIELD CRO	L	L	L
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	M	M	M

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
			Yearlong	CLOSED-CONE PINE-CYPRESS5D	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	M	M	M
R043	CALIFORNIA LEGLESS LIZARD	6 7 10 12					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	L	L	L
			Yearlong	COASTAL OAK WOODLAND5P	L	L	L
			Yearlong	COASTAL OAK WOODLAND5M	L	L	L
			Yearlong	COASTAL SCRUB	M	M	M
			Yearlong	COASTAL SCRUB2S	M	M	M
			Yearlong	COASTAL SCRUB3D	M	M	M
			Yearlong	COASTAL SCRUB4M	M	M	M
			Yearlong	COASTAL SCRUB4D	M	M	M
			Yearlong	MIXED CHAPARRAL4M	M	M	M
			Yearlong	MIXED CHAPARRAL4D	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	L	L	L
R046	RUBBER BOA	4 6 12					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	L	L	L
			Yearlong	CLOSED-CONE PINE-CYPRESS5D	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	L	L	L
R052	COACHWHIP	6 7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	L	L	L
			Yearlong	COASTAL OAK WOODLAND5P	L	L	L
			Yearlong	COASTAL SCRUB	L	L	L
			Yearlong	COASTAL SCRUB2S	L	L	L
			Yearlong	ANNUAL GRASSID	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	L	L	L
B053	STRIPED RACER	2 4 6					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	L	L	L
			Yearlong	COASTAL OAK WOODLAND5P	L	L	L
			Yearlong	COASTAL OAK WOODLAND5M	L	L	L
			Yearlong	COASTAL OAK WOODLAND5D	L	L	L
			Yearlong	COASTAL SCRUB	L	L	L
			Yearlong	COASTAL SCRUB2S	L	L	L
			Yearlong	COASTAL SCRUB3D	L	L	L
			Yearlong	COASTAL SCRUB4M	L	L	L
			Yearlong	COASTAL SCRUB4D	L	L	L
			Yearlong	MIXED CHAPARRAL4M	H	H	H
			Yearlong	MIXED CHAPARRAL4D	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	M	M	M
B055	WESTERN PATCH-NOSED SNAKE	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	M	M	M
			Yearlong	COASTAL OAK WOODLAND5P	M	M	M
			Yearlong	COASTAL OAK WOODLAND5M	M	M	M
			Yearlong	COASTAL OAK WOODLAND5D	M	M	M
			Yearlong	COASTAL SCRUB	H	H	H
			Yearlong	COASTAL SCRUB2S	H	H	H
			Yearlong	COASTAL SCRUB3D	H	H	H

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
			Yearlong	COASTAL SCRUB4M	H	H	H
			Yearlong	COASTAL SCRUB4D	H	H	H
			Yearlong	MIXED CHAPARRAL4M	M	M	M
			Yearlong	MIXED CHAPARRAL4D	M	M	M
			Yearlong	ANNUAL GRASSID	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	M	M	M
R057	GOPHER SNAKE	7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	H	H	H
			Yearlong	COASTAL OAK WOODLAND5P	H	H	H
			Yearlong	COASTAL OAK WOODLAND5M	H	H	H
			Yearlong	COASTAL OAK WOODLAND5D	L	L	L
			Yearlong	COASTAL SCRUB	H	H	H
			Yearlong	COASTAL SCRUB2S	H	H	H
			Yearlong	COASTAL SCRUB3D	H	H	H
			Yearlong	COASTAL SCRUB4M	H	H	H
			Yearlong	MIXED CHAPARRAL4M	M	M	M
			Yearlong	MIXED CHAPARRAL4D	L	L	L
			Yearlong	ANNUAL GRASSID	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2M	L	L	L
			Yearlong	FRESH EMERGENT WETLAND2D	L	L	L
			Yearlong	URBANI	L	L	L
			Yearlong	IRRIGATED ROW AND FIELD CRO	L	L	L
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	M	M	M
			Yearlong	CLOSED-CONE PINE-CYPRESS5D	L	L	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	L	L	L
R059	COMMON GARTER SNAKE	1 3 5 6 7					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	M	M	M
			Yearlong	COASTAL OAK WOODLAND5P	M	M	M
			Yearlong	COASTAL OAK WOODLAND5M	M	M	M
			Yearlong	COASTAL OAK WOODLAND5D	M	M	M
			Yearlong	COASTAL SCRUB	L	L	L
			Yearlong	COASTAL SCRUB2S	L	L	L
			Yearlong	COASTAL SCRUB3D	L	L	L
			Yearlong	COASTAL SCRUB4M	L	L	L
			Yearlong	COASTAL SCRUB4D	L	L	L
			Yearlong	MIXED CHAPARRAL4M	H	H	H
			Yearlong	MIXED CHAPARRAL4D	L	L	L
			Yearlong	ANNUAL GRASSID	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2M	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2D	H	H	H
			Yearlong	IRRIGATED ROW AND FIELD CRO	M	M	M
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	M	M	M
			Yearlong	CLOSED-CONE PINE-CYPRESS5D	M	M	M
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	H	H	H
R080	TWO-STRIPED GARTER SNAKE	6 7 12					
			Yearlong	SAN LUIS OBISPO			
			Yearlong	COASTAL OAK WOODLAND5S	M	M	L
			Yearlong	COASTAL OAK WOODLAND5P	M	M	L
			Yearlong	COASTAL OAK WOODLAND5M	M	M	L
			Yearlong	COASTAL OAK WOODLAND5D	M	M	L
			Yearlong	COASTAL SCRUB	M	M	L
			Yearlong	COASTAL SCRUB2S	M	M	L
			Yearlong	COASTAL SCRUB3D	M	M	L
			Yearlong	COASTAL SCRUB4M	M	M	L

TABLE 2.3-3

ID	SPECIES NAME	STATUS[b]	SEASON	LOCATIONS HABITATS AND SPECIAL ELEMENTS[c]	IMPORTANCE[d] R	C	F
			Yearlong	MIXED CHAPARRAL4M	M	M	L
			Yearlong	MIXED CHAPARRAL4D	M	M	L
			Yearlong	ANNUAL GRASSID	L	L	L
			Yearlong	FRESH EMERGENT WETLAND2M	H	H	H
			Yearlong	FRESH EMERGENT WETLAND2D	H	H	H
			Yearlong	CLOSED-CONE PINE-CYPRESS5M	M	M	L
			Yearlong	VALLEY FOOTHILL RIPARIAN5P	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5M	H	H	H
			Yearlong	VALLEY FOOTHILL RIPARIAN5D	H	H	H

Total Number of Species: 161

Footnotes:

(a) Supported by California Interagency Wildlife Task Group and maintained by the California Department of Fish and Game - Database Version 7.0. The species list is the result of a computer simulation and contains some species not known to occur on Diablo Canyon lands.

(b) STATUS: 1=Fed End, 2=Fed Threat, 3=Ca End, 4=Ca Threat, 5=Ca Full Pro, 6=Ca Prot, 7=Ca SSC, 8=Fed Prop End, 9=Fed Prop Threat, 10=Fed Cand, 11=BLM Sens, 12=USFS Sens, 13=CDF Sens, 14=Harvest

(c) Habitats/Seral Stages: Type/Stage 1:COW5S; Type/Stage 2: COW5P; Type/Stage 3: COW5M; Type/Stage 4: COW5D; Type/Stage 5: CSC1; Type/Stage 6: CSC2S, Type/Stage 7: CSC3D, Type/Stage 8: CSC4M, Type/Stage 9: CSC4D, Type/Stage 10: MCH4M; Type/Stage 11: MCH4D; Type/Stage 12: AGS1D; Type/Stage 13: FEW2M, Type/Stage 14: FEW2D; Type/Stage 15: URB1; Type/Stage 16: IRF1; Type/Stage 17: CPC5M; Type/Stage 18: CPC5D; Type/Stage 19: MAR4G; Type/Stage 20: MAR4R; Type/Stage 21: VP15P; Type/Stage 22: VR15M; Type/Stage 23: VR15D

(d) IMPORTANCE: R=Reproduction, C=Cover, F=Feeding, L=Low, M=Medium, H=High

TABLE 2.3-4

SURVEY RESULTS FOR TARGET SENSITIVE INVERTEBRATE AND VERTEBRATE WILDLIFE SPECIES KNOWN FROM OR LIKELY TO OCCUR IN THE VICINITY OF THE ISFSI PROJECT

Species	Status	Species Observed on Site[a]	Habitat Use	Acres of Suitable Habitat	Habitat Descriptions
INVERTEBRATES					
Smith's blue butterfly *Euphilotes enoptes smithi*	FE	No	Larval food plants	568	Coastal dunes and coastal scrub associated with wild buckwheat *(Eriogonum latifolium, E. parvifolium*, and *E. nudum).*
Monarch butterfly *Danaus plexippus*	SA	Yes	Overwinter ing	1	Trees such as Monterey pine (*Pinus radiata*) and blue gum *(Eucalyptus globulus*) usually within 1 mile of the coastline
Morro Bay shoulderband snail *Helminthoglypta walkeriana*	FE	No	Year-round	268	Duff beneath various dune plants in coastal strand and coastal sage scrub.
VERTEBRATES					
Fish					
Steelhead, South-Central Coast ESU Oncorhynchus mykiss	FT	No	Year-round	Possibly occurring in Coon Creek	Anadromous species; returns to coastal streams for spawning
Tidewater Goby Eucyclobins newberryi	FE	No	Year-round	Possibility occurring in Coon Creek	Brackish and freshwater lagoons near the mouths of coastal streams

TABLE 2.3-4

Species	Status	Species Observed on Site	Habitat Use	Acres of Suitable Habitat	Habitat Descriptions
Amphibians					
Coast Range newt *Taricha torosa torosa*	CSC	No	Breeding	Moderate: 27,501 Low: 79,431 (stream feet)	Streams, ponds, and any other available surface water.
California red-legged frog *Rana Aurora draytoni*	CSC, FT	No	Breeding	107,108 (stream feet)	Breeds in temporary and permanent water sources with pools and ponds. Breeding sites are usually greater than 2 ft deep and contain emergent vegetation.
Reptiles					
Green sea turtle Chelonia mydas	FT	No	Seasonal	Not known	Infrequent visitor to coastal waters off Diablo Canyon.
Southwestern pond turtle *Clemmys marmorata pallida*	CSC	No	Breeding	Moderate: 27,501 Low: 79,431 (stream feet)	Lives in or near any temporary or permanent water sources, usually in ponds and deeper pools in permanent streams.
Silvery legless lizard *Anniella pulchra pulchra*	CSC	No	Year-round	2,676	Found in areas with sandy or loose organic soils or where there is abundant leaf litter.
Birds					
Brown pelican *Pelicans occidentalis californicus*	FE, SE	Yes	Off-shore feeding, nesting	Not determined	Off-shore rocks and coastal bluffs overlooking the water are used for roosting. No nesting occurs along the Pecho Coast. Foraging is limited to off-shore open water areas.
White-tailed kite *Elanus caeruleus*	CFP	No	Breeding	1,669	Inhabits grasslands, agricultural fields, marshes, and roadsides where rodents are common. Nests are constructed in oak, willow, or other tree stands.

TABLE 2.3-4

Species	Status	Species Observed on Site	Habitat Use	Acres of Suitable Habitat	Habitat Descriptions
Northern harrier *Circus cyaneus*	CSC	No	Breeding	527	Inhabits fresh and saltwater marshes, grasslands, and agricultural fields. Nests are usually on the ground near wet areas such as marshes, where they use dense grasses or shrubby vegetation for cover.
Sharp-shinned hawk *Accipiter striatus*	CSC	Yes	Breeding	380	No nesting individuals were observed. Nests are often found near water and in dense woodlands next to open areas.
Cooper's hawk *Accipiter cooperi*	CSC	Yes	Breeding	High: 1,427 Moderate: 1,681 Low: 153	One nesting pair was observed in Irish Canyon; a few other individuals were observed and may have been breeding on the property. Generally associated with riparian areas and other woodlands; dense stands near water are preferred. Forage in broken woodlands and woodland edges.
Ferruginous hawk *Buteo regalis*	CSC,	Yes	Winter foraging	2,996	Prefers open habitats such as grasslands and agricultural areas to forage for small mammals
Golden eagle *Aquila chrysaetos*	CFP, CSC, BEPA	Yes	Breeding	2,999	Observed foraging for ground squirrels near Crowbar Rock; prefers open, sloping landscapes such as foothills and canyons with cliffs and trees for nesting and cover. Adjacent, open terrain such as grasslands is used for hunting. Nests are located in large trees, cliffs, or transmission towers with an unobstructed view.
Merlin *Falco columbarius*	CSC	Yes	Winter foraging	1,247	Observed soaring over project area. Inhabits coastal areas, open woodlands, savannahs, and grasslands. Prefers open country and is often nomadic during the winter.
Burrowing owl *Asio otus*	CSC	Yes	Year-round	525	Observed occupying squirrel burrows on marine terrace north of the power plant. Prefers open, dry grasslands; agricultural areas; and rolling hills at low elevations. Abandoned ground squirrel and other mammal burrows are used for nesting.

TABLE 2.3-4

Species	Status	Species Observed on Site	Habitat Use	Acres of Suitable Habitat	Habitat Descriptions
California spotted owl *Strix occidentalis*	CSC	No	Breeding	388	Prefers mature stands of woodland habitats that provide dens canopy cover. Suitable habitat occurs in the mature oak and riparian woodlands of large canyons such as Diablo and Irish canyons.
Long-eared owl *Asio otus*	CSC	No	Breeding	166	Prefers riparian habitat or other thickets with a dense canopy for nesting and roosting. Usually hunts in open areas and occasionally woodlands.
Short-eared owl *Asio flammeus*	CSC	No	Breeding	2,780	Found in open country, marshes, wet meadows, and fields. Nests are on the ground in grasslands below a 2,000-ft elevation.
California horned lark *Eremophila alpestris actia*	CSC	Yes	Breeding	2,780	Several nesting pairs were observed in grazed pastureland. Found in open habitats such as coastal grasslands and pastureland, where they breed on the ground.
Loggerhead shrike *anius ludovicianus*	Cat. 2	Yes	Breeding	1,861	No breeding pairs were observed. Nests are located in the dense foliage of shrubs and trees adjacent to open habitat, where they prefer to forage.
Yellow warbler *Dendroica petechia Brewster*	CSC	Yes	Breeding	High: 50 Low: 116	No breeding pairs were observed. Prefers dense, multi-layered tree canopy and heavy brush understory in riparian woodlands.
Yellow-breasted chat *cteria virens*	CSC	No	Breeding	High: 81 Low: 85	Nests are usually found near water in dense thickets of willows or other brushy tangles.
Bell's sage sparrow *Amphispiza belli belli*	CSC	No	Breeding	3,242	Nests are located in fairly dense stands of coastal scrub and chaparral, with a marked preference for chamise. Prefers to forage in same habitat.
Tricolored blackbird *Agelaius tricolor*	CSC	Yes	Breeding	1	No breeding pairs were observed. Typically breeds in cattails and tules but is known to use partially submerged willow thickets blackberries, and stinging nettles.

TABLE 2.3-4

Species	Status	Species Observed on Site	Habitat Use	Acres of Suitable Habitat	Habitat Descriptions
Townsend's big-eared bat *Plecotus townsendii townsendii*	CSC	No	Foraging/ roosting	2,842	Uses very large tree cavities, large crevices, caves, buildings, and other manmade structures for roosting. Prefers mesic sites such as riparian corridors, springs, and stock ponds for foraging.
Pallid bat *Antrozous pallidus*	CSC	Yes	Foraging/ Roosting	2,676	Uses caves, rock crevices, and occasionally tree cavities, buildings, and other manmade structures for roosting. Prefers oak trees for roost sites and forages extensively in oak woodlands.
San Diego desert woodrat *Neotoma lepida intermedia*	CSC	Yes	Year-round	3,751	Found throughout the property. Builds nests in rock outcrops in coastal scrub and chaparral habitat. May also use rock outcrops in grassland.
Mammals					
Ringtail *Bassariscus astutus*	CFP	No	Year-round	5,738	May occupy a wide range of habitat types, especially where there is water nearby and rock areas for den sites. Common habitat types include riparian, oak woodland, and chaparral.
American badger *Taxidea taxus*	CSC	No	Year-round	6,237	Occurs in a wide variety of open, uncultivated habitats, with dry friable soils and sufficient prey. Prefers habitats such as grasslands, oak savannas, sparse scrub, and chaparral.
Southern Sea Otter Enhydra lutris nereis	FT	No	Year-round	Marine intertidal and subtidal zones	Forages in intertidal and subtidal areas with abundant invertebrate prey; uses kelp forests for resting and escape coves.

TABLE 2.3-4

[a] **Refers to the immediate (approximately 9 acre) ISFSI site.**

U.S. FISH AND WILDLIFE SERVICE

FE Listed as endangered.

FT Threatened: any species that is likely to become an endangered species (a species in danger of extinction) within the foreseeable future throughout all or a significant portion of its range. These species receive special legal protection under the Endangered Species Act.

FPE Proposed endangered (May 1994).

BEPA Federal Bald Eagle Protection Act: golden eagles receive legal protection under this act.

CALIFORNIA DEPARTMENT OF FISH AND GAME

CT California Threatened: a native species or subspecies that, although not currently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of special protection and management efforts.

CSC Species of Special Concern: a designation given by the CDFG to animal species whose state breeding populations are of special concern because they may face extirpation. These species receive no special legal protection, but the CDFG recommends consideration of project-related impacts to them to avoid a future listing as threatened or endangered.

CFP Fully Protected Species in California: these species cannot be taken in any manner at any time of the year except for scientific purposes under special permit.

TABLE 2.3-5

PHYLOGENETIC LISTING OF MARINE ORGANISMS
ASSOCIATED WITH THE DIABLO COAST LINE
(COMPILED FROM RESULTS OF DIABLO CANYON LONG-TERM
THERMAL EFFECTS MONITORING PROGRAM)

Current Species Name	Describer, Date	Common Name
Chlorophyta		
Bryopsis corticulans	Setchell	
Bryopsis hypnoides	Lamouroux	
Bryopsis spp.	Lamouroux	
Chaetomorpha spp.	Kützing	
Cladophora graminea	Collins	
Cladophora spp.	Kützing	
Codium fragile	(Suringar) Hariot	
Codium setchellii	Gardner	
Derbesia marina	(Lyngbye) Solier	
Enteromorpha linza	(Linnaeus) J. Agardh	
Enteromorpha spp.	Link	
Halicystis ovalis (=Derbesia marina)	(Lyngbye) Areschoug	
Ulva spp.	Linnaeus	Sea lettuce
Phaeophyta		
Alaria marginata	Postels & Ruprecht	
Analipus japonicus	(Harvey) Wynne	
Coilodesme californica	(Ruprecht) Kjellman	
Colpomenia peregrina	(Sauvageau) Hamel	
Colpomenia spp.	Derbes & Solier	
Cystoseira osmundacea	(Turner) C. Agardh	
Desmarestia spp.	(Lightfoot) Lamouroux	
Desmarestia tabacoides	(C.A. Agardh) Okamura	
Dictyoneurum californicum	Ruprecht	
Dictyota binghamiae	J. Agardh	
Dictyota spp.	Lamouroux	
Ectocarpus spp.	Lyngbye	
Egregia menziesii	(Turner) Areschoug	Feather-Boa Kelp
Fucus gardneri	Silva	
Halorhipis winstonii	(Anderson) Saunders	
Haplogloia andersonii	(Farlow) Levring	
Hesperophychus californicus	(Decaisne) Silva	
Hincksia granulosa	(J.E. Smith) Silva	
Laminaria setchellii	(Kjellman) Silva	Oar Kelp
Leathesia difformis	(Linnaeus) Areschoug	

TABLE 2.3-5

Current Species Name	Describer, Date	Common Name
Macrocystis spp.	C. Agardh	Giant Kelp
Nereocystis luetkeana	(Mertens f.) Postels & Ruptrecht	Bull Kelp
Pelvetia compressa	(J. Agardh) DeToni	
Pelvetiopsis limitata	Gardner	
Petrospongium rugosum	(Okamura) Setchell & Gardner	
Phaeostrophion irregulare	Setchell & Gardner	
Pterygophora californica	Ruprecht	Tree Kelp
Ralfsia spp.	Berkeley	
Rosenvingea floridana	(Taylor) Taylor	
Sargassum muticum	(Yendo) Fensholt	
Scytosiphon dotyi	Wynne	
Scytosiphon lomentaria	(Lyngbye) Link	
Scytosiphon spp.	C. Agardh	
Soranthera ulvoidea	Postels & Ruprecht	
Rhodophyta		
Ahnfeltia fastigiata	(Endlicher) Makienko	
Ahnfeltiopsis leptophylla	(J. Agardh) Silva & DeCew	
Ahnfeltiopsis linearis	(C. Agardh) Silva & DeCew	
Ahnfeltiopsis spp.		
Amplisiphonia pacifica	Hollenberg	
Anisocladella pacifica	Kylin, 1941	
Antithamnion densum	(Suhr) Howe	
Antithamnion spp.	Naegeli	
Antithamnionella pacifica	(Harvey) Wollaston	
Bossiella plumosa	(Manza) Silva	
Bossiella schmittii	(Manza) Johansen	
Bossiella spp.	Silva	
Branchioglossum bipinnatifidum	(Montagne) Wynne	
Branchioglossum undulatum	Dawson	
Calliarthron spp.	Manza	
Calliarthron tuberculosum	(Postels & Ruprecht) Dawson	
Callithamnion acutum	Kylin	
Callithamnion biseriatum	Kylin	
Callithamnion pikeanum	Harvey	
Callithamnion rupicola	(Anderson)	
Callophyllis crenulata	Setchell	
Callophyllis firma	(Kylin) Norris	
Callophyllis flabellulata	Harvey	
Callophyllis spp.	Kützing	
Callophyllis violacea	J. Agardh	

TABLE 2.3-5

Current Species Name	Describer, Date	Common Name
Centroceras clavulatum	(C.A. Agardh) Montagne	
Ceramium eatonianum	(Farlow) DeToni	
Ceramium spp.	Roth	
Chondracanthus canaliculatus	(Harvey) Guiry	
Chondracanthus corymbiferus		Turkish Towel
Chondracanthus harveyanus	(Kützing) Guiry	
Chondracanthus spinosus	(Kützing) Guiry	
Chondria decipiens	Kylin	
Clathromorphum parcum	(Setchell & Foslie) Adey	
Corallina officinalis	Linnaeus	
Corallina spp.	Linnaeus	
Corallina vancouveriensis	Yendo	
Cryptopleura lobulifera	(J. Agardh) Kylin	
Cryptopleura ruprechtiana	(J. Agardh) Kylin	
Cryptopleura spp.	Kützing	
Cryptopleura violacea	(J. Agardh) Kylin	
Cryptosiphonia woodii	(J. Agardh) J. Agardh	
Cumagloia andersonii	(Farlow) Setchell & Gardner	
Delesseria decipiens	J. Agardh	
Dilsea californica	(J. Agardh) Kuntze	
Endocladia muricata	(Postels & Ruprecht) J. Agardh	
Erythrophyllum delesserioides	J. Agardh	
Farlowia compressa	J. Agardh	
Farlowia mollis	(Harvey & Bailey) Farlow & Setchell	
Farlowia spp.	J. Agardh	
Fauchea laciniata	J. Agardh	
Fauchea spp.	Montagne	
Fryeella gardneri	(Setchell) Kylin	
Gastroclonium subarticulatum	(Turner) Kützing	
Gelidium coulteri	Harvey	
Gelidium purpurascens	Gardner	
Gelidium pusillum	(Stackhouse) Le Jolis	
Gelidium robustum	(Gardner) Hollenberg & Abbott	
Gelidium spp.	Lamouroux	
Gloiosiphonia californica	(Farlow) J. Agardh	
Gracilariopsis lemaneiformis	(Bory) Dawson, Acleto & Foldvik	
Grateloupia doryphora	(Montagne) Howe	
Grateloupia spp.	C. Agardh	
Griffithsia pacifica	Kylin	

TABLE 2.3-5

Current Species Name	Describer, Date	Common Name
Gymnogongrus chiton	(Howe) Silva & DeCew	
Halosaccion americanum	(Gmelin) Lee	
Halymenia schizymenioides	Hollenberg & Abbott	
Halymenia spp.	C.A. Agardh	
Herposiphonia verticillata	(Harvey) Kylin	
Hildenbrandia spp.	Nardo	
Hymenena cuneifolia	Doty, 1947	
Hymenena flabelligera	(J. Agardh) Kylin	
Hymenena multiloba	(J. Agardh) Kylin	
Hymenena spp.	Greville	
Janczewskia gardneri	Setchell & Gardner	
Kallymenia spp.	J. Agardh	
Lithophyllum spp.	Philippi	
Maripelta rotata	(Dawson) Dawson	
Mastocarpus jardinii	(J. Agardh) West	
Mastocarpus papillatus	(C.Agardh) Kützing	Grape-Stone Seaweed
Mazzaella affinis	(Harvey) Fredericq	
Mazzaella californica (prev. *Rhod. cal.)*	(J. Agardh) De Toni filius	
Mazzaella californica (prev. *Rhod. owen.)*	(J. Agardh) De Toni filius	
Mazzaella flaccida		
Mazzaella flaccida (prev. *Irid. flaccida)*	(Setchell & Gardner) Fredericq	Iridescent Seaweed
Mazzaella heterocarpa	(Postels & Ruprecht) Fredericq	
Mazzaella leptorhynchos	(J. Agardh) Leisler	
Mazzaella lilacina (prev. *Irid. cord. cord.)*	(Postells & Ruprecht) Leister	
Mazzaella lilacina (prev. *Irid. cord. sple.)*	(Postells & Ruprecht) Leister	
Mazzaella lilacina (prev. *Irid. cord.)*	(Postells & Ruprecht) Leister	
Mazzaella linearis	(Setchell & Gardner) Fredericq	
Mazzaella rosea	(Kylin) Fredericq	
Mazzaella spp.	Bory	
Mazzaella spp. (prev. *Rhodoglossum* spp.)	J. Agardh	
Mazzaella volans	(C. Agardh) Fredericq	
Melobesia mediocris	(Foslie) Setchell & Mason	
Membranoptera platytphylla	(Setchell & Gardner) Kylin	
Membranoptera spp.	Stackhouse	

TABLE 2.3-5

Current Species Name	Describer, Date	Common Name
Membranoptera tenuis	(Setchell & Gardner) Kylin	
Microcladia borealis	Ruprecht	
Microcladia californica	Farlow	
Microcladia coulteri	Harvey	
Microcladia spp.	Greville	
Nemalion helminthoides	(Velley) Batters	
Neoptilota densa	(C.A. Agardh) Kylin	
Neoptilota hypnoides	(Harvey) Kylin	
Neoptilota spp.	Kylin	
Neorhodomela larix	(Turner) Masuda	
Nienburgia andersoniana	(J. Agardh) Kylin	
Nitophyllum northii	Hollenberg & Abbott	
Norrissia setchellii	(Kylin) Balakrishnan	
Odonthalia floccosa	(Esper) Falkenberg	
Odonthalia washingtoniensis	Kylin	
Opuntiella californica	(Farlow) Kylin	
Osmundea blinksii	(Hollenberg & Abbott) Nam	
Osmundea spectabilis	(Postels & Ruprecht) Nam	
Osmundea spp.	Lamouroux	
Petrocelis franciscana	Setchell & Gardner	
Phycodrys isabelliae	Norris & Wynne	
Phycodrys setchellii	Skottsberg	
Phycodrys spp.	Kützing	
Pikea californica	Harvey	
Pikea robusta	Abbott	
Pikea spp.	Harvey	
Pleonosporium spp.	Naegeli	
Pleonosporium squarrulosum	(Harvey) Abbott	
Plocamium cartilagineum	(Linnaeus) Dixon	
Plocamium spp.	Lamouroux	
Plocamium violaceum	Farlow	
Polyneura latissima	(Harvey) Kylin	
Polysiphonia paniculata	Montagne	
Polysiphonia spp.	Greville	
Porphyra nereocystis	Anderson	
Porphyra occidentalis	Setchell & Hus	
Porphyra perforata	J. Agardh, 1883	Nori
Porphyra spp.	C.A. Agardh	
Prionitis australis	(J. Agardh) J. Agardh	
Prionitis lanceolata	(Harvey) Harvey	
Prionitis lyallii	Harvey	
Prionitis spp.	J. Agardh	
Pseudolithophyllum neofarlowii	(Setchell & Mason) Adey	

TABLE 2.3-5

Current Species Name	Describer, Date	Common Name
Pterochondria woodii (var. *woodii*)	(Harvey) Hollenberg	
Pterocladia caloglossoides	(Howe) Dawson	
Pterocladia media	Dawson	
Pterosiphonia baileyi	(Harvey) Falkenberg	
Pterosiphonia bipinnata	(Postels & Ruprecht) Falkenberg	
Pterosiphonia dendroidea	(Montagne) Falkenberg	
Pterosiphonia spp.	Falkenberg	
Pterothamnion heteromorphum	(J. Agardh) Athanasiadis & Kraft	
Pterothamnion spp.	J. Agardh	
Pterothamnion villosum	(Kylin) Athanasiadis & Kraft	
Rhodoptilum plumosum	(Harvey & Bailey) Kylin	
Rhodymenia californica	Kylin	
Rhodymenia callophyllidoides	Hollenberg & Abbott	
Rhodymenia pacifica	Kylin	
Rhodymenia spp.	Greville	
Sarcodiotheca gaudichaudii	(Montagne) Gabrielson	
Schimmelmannia plumosa	(Setchell) Abbott	
Schizymenia epiphytica	(Setchell & Lawson) Smith & Hollenberg	
Schizymenia pacifica	(Kylin) Kylin	
Schizymenia spp.	J. Agardh	
Scinaia confusa	(Setchell) Huisman	
Smithora naiadum	(Anderson) Hollenberg	
Stenogramme interrupta	(C.A. Agardh) Montagne	
Tiffaniella snyderae	(Farlow) Abbott	
Weeksia digitata	Abbott	
Weeksia reticulata	Setchell	
Weeksia spp.	Setchell	
Spermatophyta		
Phyllospadix scouleri	Hooker	Surfgrass
Phyllospadix spp.	Hooker	
Protozoa		
Folliculina spp.		
Gromia oviformis	Dujardin, 1835	
Quinqueloculina spp.		
Rosalina spp.		
Spirillina spp.		
Zoothamnium spp.		

TABLE 2.3-5

Current Species Name	Describer, Date	Common Name
Porifera		
Acarnus erithacus	de Laubenfels, 1927	
Clathrina spp.		
Clathriopsamma pseudonapya	de Laubenfels, 1930	
Cliona spp.		Boring Sponge
Craniella arb	(de Laubenfels, 1932)	Gray Puffball Sponge
Haliclona spp.		
Halisarca spp.		
Hymenamphiastra cyanocrypta	de Laubenfels	Cobalt sponge
Leucandra heathi	Urban, 1905	
Leucetta losangelensis	(De Laubenfels, 1930)	
Leucilla nuttingi	(Urban, 1902)	
Leucosolenia eleanor	Urban, 1905	
Leucosolenia spp.		
Lissodendoryx firma	(Lambe, 1895)	
Mycale psila		
Ophlitaspongia pennata	(Lambe, 1859)	
Plocamia karykina	(De Laubenfels)	
Spheciospongia confoederata	de Laubenfels, 1930	Moon Sponge
Tethya aurantia	(de Laubenfels, 1932)	Orange Puffball Sponge
Cnidaria		
Abietinaria spp.		
Aglaophenia spp.		Ostrich-Plume Hydroid
Anthopleura artemisia	(Pickering in Dana, 1848)	
Anthopleura elegantissima	(Brandt, 1835)	Aggregating Anemone
Anthopleura spp.		
Anthopleura xanthogrammica	(Brandt, 1835)	Giant Green Anemone
Balanophyllia elegans	Verrill, 1864	Orange Cup Coral
Cactosoma arenaria	Carlgren, 1831	
Clavularia spp.		
Corynactis californica	Carlgren, 1936	Strawberry Anemone
Diadumene spp.		
Dynamena spp.		
Epiactis prolifera	Verrill, 1869	Proliferating Anemone
Eudendrium californicum	Torrey, 1902	
Halcampa decemtentacula	Hand, 1954	
Haliclystus auricula	(Rathke, 1806)	
Manania spp.		
Obelia spp.		
Paracyathus stearnsii		
Pelagia colorata	(Forskål, 1775)	
Plumularia spp.		

TABLE 2.3-5

Current Species Name	Describer, Date	Common Name
Sertularella spp.		
Stylantheca porphyra	(Fisher, 1931)	
Stylantheca spp.		
Syncoryne spp.		
Tubularia spp.		
Urticina coriacea	(Cuvier, 1793)	
Urticina crassicornis	(Müller, 1776)	
Urticina lofotensis	(Danielssen, 1890)	
Urticina piscivora		
Urticina spp.		
Platyhelminthes		
Alloioplana californica	(Heath and McGregor, 1912)	
Eurylepta californica	Hyman, 1959	
Eurylepta spp.		
Hoploplana californica	Hyman, 1953	
Koinostylochus burchami	(Heath and McGregor, 1912)	
Notoplana spp.		
Prostheceraeus bellostriatus	Hyman, 1953	
Pseudoceros montereyensis	Hyman, 1953	
Stylochus franciscanus	Hyman, 1953	
Stylochus spp.		
Nemertea		
Amphiporus imparispinosus	Griffin, 1898	
Micrura verrilli	Coe, 1901	
Nemertopsis gracilis	Coe, 1904	
Paranemertes peregrina	Coe, 1901	
Tubulanus polymorphus	Reinier, 1804	
Tubulanus sexlineatus	(Griffin, 1898)	
Sipuncula		
Phascolosoma agassizii	Keferstein, 1867	
Themiste pyroides	(Chamberlain, 1919)	
Annelida		
Aphrodita spp.		
Arabella iricolor	(Montagu, 1804)	
Arenicola cristata	Healy and Wells, 1959	Lugworm
Axiothella rubrocincta	(Johnson, 1901)	
Chaetopterus variopedatus	(Renier,1804)	Parchment-Tube Worm
Cheilonereis cyclurus	(Harrington, 1897)	
Circeis spirillum	(Linnaeus, 1758)	

TABLE 2.3-5

Current Species Name	Describer, Date	Common Name
Diopatra ornata	Moore, 1911	
Dodecaceria fewkesi	Berkeley and Berkeley, 1954	
Eudistylia polymorpha	(Johnson, 1901)	Feather-Duster Worm
Flabelliderma essenbergae	Hartman, 1961	
Halosydna brevisetosa	Kinberg, 1855	Scale Worm
Hydroides elegans	(Hartman, 1969)	
Janua spp.		
Myxicola infundibulum	(Reinier, 1809)	
Neosabellaria cementarium	(Moore, 1906)	Honeycomb Worm
Nereis grubei	(Kinberg, 1866)	
Nereis pelagica	Hartman, 1936	
Nereis spp.		
Paradexiospira vitrea		
Pherusa inflata	(Treadwell, 1914)	
Phragmatopoma californica	(Fewkes, 1889)	
Phragmatopoma spp.		
Phyllochaetopterus prolifica	Potts, 1914	
Pileolaria spp.		
Pista elongata	Moore, 1909	
Pista pacifica	Berkeley and Berkeley, 1942	
Pista spp.		
Platynereis bicanaliculata	(Baird, 1863)	
Protolaeospira eximia	(Bush, 1904)	
Protolaeospira spp.		
Sabella spp.		
Sabellaria spp.		
Salmacina tribranchiata	(Moore, 1923)	
Serpula vermicularis	Linnaeus, 1767	
Spiochaetopterus costarum	(Claparède, 1870)	
Spirobranchus spinosus	Moore, 1923	
Spirorbis spp.		
Streblosoma crassibranchia	Treadwell, 1914	
Lumbrineris spp.		
Arthropoda		
Acartia spp.		
Achelia chelata	(Hilton, 1939)	
Alpheidae unid.		
Alpheus clamator	(Guérin, 1832)	Snapping Shrimp
Alpheus spp.		
Ammothea hilgendorfi	(Böhm, 1879)	
Ampelisca spp.		
Ampithoe spp.		

TABLE 2.3-5

Current Species Name	Describer, Date	Common Name
Aoroides columbiae	Walker, 1898	
Aoroides spp.		
Balanus aquila	Pilsbry, 1907	
Balanus crenatus	Bruguière, 1789	
Balanus glandula	Darwin, 1854	
Balanus nubilus	Darwin, 1854	
Balanus pacificus	Pilsbry, 1916	
Balanus spp.		
Balanus trigonus	Darwin, 1854	
Betaeus harfordi	(Kingsley, 1878)	
Blepharipoda occidentalis	Randall, 1839	Spiny Mole Crab
Calanus pacificus		
Callianassa californiensis	Dana, 1854	Bay Ghost Shrimp
Cancer antennarius	Stimpson, 1856	Rock Crab
Cancer anthonyi	Rathbun, 1897	Yellow Crab
Cancer jordani	Rathbun, 1900	Hairy Cancer Crab
Cancer productus	Randall, 1839	Red Crab
Cancer spp.		
Candacia spp.		
Caprella equilibra	Say, 1818	Skeleton Shrimp
Caprella spp.		
Centropages bradyi		
Chironomidae larvae		
Chthamalus fissus	Darwin, 1854	
Cirolana harfordi	Lockington, 1877	
Clausocalanus arcuicornis		
Clausocalanus furcatus		
Clausocalanus jobei		
Clausocalanus lividus		
Clausocalanus mastigophorus		
Clausocalanus parapergens		
Clausocalanus pergens		
Clausocalanus spp.		
Crangon nigricauda	Stimpson, 1856	
Crangon spp.		
Crangon stylirostris	Holmes, 1900	Bay Shrimp
Cryptolithodes sitchensis	Brandt, 1853	Umbrella Crab
Ctenocalanus vanus		
Cycloxanthrops novemdentatus	(Lockington, 1877)	Large Pebble Crab
Elasmopus spp.		
Erichthonius brasiliensis	(Dana, 1853)	
Eucalanus spp.		
Evadne spinifera		

TABLE 2.3-5

Current Species Name	Describer, Date	Common Name
Exosphaeroma inornata	Dow, 1958	
Flabellifera unid.		
Gnathia spp.		
Hapalogaster cavicauda	Stimpson, 1859	
Hemigrapsus nudus	(Dana, 1851)	Purple Shore Crab
Hemigrapsus oregonensis	(Dana, 1851)	Yellow Shore Crab
Heptacarpus carinatus	Holmes, 1900	
Heptacarpus cristatus	(Stimpson, 1860)	
Heptacarpus sitchensis	(Stimpson, 1851)	Red-Banded Transparent Shrimp
Heptacarpus spp.		
Heptacarpus taylori	(Stimpson, 1857)	
Heterocrypta occidentalis	(Dana, 1854)	
Idotea aculeata	Stafford, 1913	
Idotea fewkesi	Richardson, 1905	
Idotea montereyensis	Maloney, 1933	
Idotea resecata	Stimpson, 1857	
Idotea schmitti	Menzies, 1951	
Idotea spp.		
Idotea stenops	(Benedict, 1898)	
Idotea urotoma	Stimpson, 1864	
Idotea wosnesenskii	(Brandt, 1851)	
Jassa slatteryi	(Montagu, 1808)	
Joeropsis spp.		
Lebbeus laqunae	(Schmitt, 1921)	
Lepas anatifera	Linnaeus, 1758	Goose Barnacle
Leucothoe alata	Bernard, 1959	
Ligia occidentalis	Dana, 1853	
Lophopanopeus leucomanus heathii	Rathbun, 1900	
Lophopanopeus spp.		
Loxorhynchus crispatus	Stimpson, 1857	Masking Crab
Loxorhynchus spp.		
Maera simile	(Stout, 1913)	
Maera spp.		
Maera vigota	Barnard, 1969	
Megabalanus californicus	(Pilsbry, 1916)	
Metacaprella kennerlyi	(Stimpson, 1864)	
Mimulus foliatus	Stimpson, 1860	
Nannocalanus minor		
Nebalia pugettensis	(Clark,1932)	
Nymphopsis spinosissima	(Hall, 1912)	
Oithona settigera		
Oncaea mediterranea		

TABLE 2.3-5

Current Species Name	Describer, Date	Common Name
Orchestia traskiana	Stimpson, 1857	
Pachycheles pubescens	Holmes, 1900	
Pachycheles rudis	Stimpson, 1859	Thick-Clawed Porcelain Crab
Pachycheles spp.		
Pachygrapsus crassipes	Randall, 1839	Lined Shore Crab
Pagurus spp.		Hermit Crab
Panulirus interruptus	(Randall)	
Paracalanus parvus		
Paracalanus spp.		
Paracerceis cordata	(Richardson, 1899)	
Parallorchestes ochotensis	(Brandt, 1851)	
Paraxanthias taylori	(Stimpson, 1860)	Lumpy Crab
Penilia avirostris		
Petrolisthes cinctipes	(Randall, 1839)	Flat Porcelain Crab
Petrolisthes eriomerus	Stimpson, 1871	Porcelain Crab
Petrolisthes spp.		
Photis conchicola	Alderman, 1936	
Photis spp.		
Phronima spp.		
Pleuromamma spp.		
Podocerus spp.		
Pollicipes polymerus	Sowerby, 1833	Leaf Barnacle
Polycheria osborni	Calman, 1898	
Pseudocalanus spp.		
Pugettia producta	(Randall, 1839)	Kelp Crab
Pugettia richii	Dana, 1851	
Pugettia spp.		
Pycnogonum stearnsi	Ives, 1892	
Rhincalanus spp.		
Scyra acutifrons	Dana, 1851	Sharp-Nosed Crab
Spirontocaris spp.		Broken-Backed Shrimp
Taliepus nuttallii	(Randall, 1839)	Southern Kelp Crab
Tetraclita rubescens	(Darwin, 1854)	
Tiron biocellata	Barnard, 1962	
Tortanus spp.		
Mollusca		
Acanthina punctulata	Sowerby, 1825	Spotted Unicorn
Acanthina spirata	(Blainville, 1832)	Angular Unicorn
Acanthina spp.		
Acanthodoris lutea	MacFarland, 1925	Orange-Peel nudibranch
Acanthodoris rhodoceras	Cockerell and Eliot, 1905	Black-and-White Dorid

TABLE 2.3-5

Current Species Name	Describer, Date	Common Name
Acmaea mitra	Rathke, 1833	White-Cap Limpet
Acmaea spp.		
Aegires albopunctatus	MacFarland, 1925	Salt-and-Pepper Nudibranch
Aeolidia papillosa	(Linnaeus, 1761)	Shag-Rug Nudibranch
Aeolidiella oliviae	(MacFarland, 1966)	
Aldisa sanguinea	(Cooper, 1862)	Blood Spot
Alia carinata	(Hinds, 1844)	Carinated Dove Snail
Alia spp.		
Alia tuberosa	(Carpenter, 1864)	
Alvinia spp.		
Amphissa columbiana	Dall, 1916	Wrinkled Dove Snail
Amphissa spp.		
Amphissa versicolor	Dall, 1871	Variegated Amphissa
Anisodoris nobilis	(MacFarland, 1905)	Sea Lemon
Aplysia californica	Cooper, 1863	California Brown Sea Hare
Aplysia vaccaria	Winkler, 1955	California Black Sea Hare
Archidoris montereyensis	(Cooper, 1862)	Monterey Dorid
Archidoris odhneri	(MacFarland, 1966)	White-Knight Nudibranch
Assiminea californica	(Tryon, 1865)	
Astyris aurantiaca	(Dall, 1871)	
Babakina festiva	(Roller, 1972)	
Barleeia acuta	(Carpenter, 1864)	
Barleeia haliotiphila	Carpenter, 1864	
Barleeia spp.		
Basiliochiton heathii	(Pilsbry, 1898)	
Basiliochiton lobium	Berry	
Berthella californica	(Dall, 1990)	White Berthella
Berthella strongi	(MacFarland, 1966)	
Bittium eschrichtii	(Middendorff, 1849)	
Bittium spp.		
Cadlina flavomaculata	MacFarland, 1905	Yellow-Spotted Cadlina
Cadlina luteomarginata	MacFarland, 1966	Yellow-Edged Cadlina
Cadlina modesta	MacFarland, 1966	Modest Cadlina
Cadlina spp.		
Caecum californicum	Dall, 1885	
Calliostoma annulatum	(Lightfoot, 1786)	Purpled-Ringed Top Snail
Calliostoma canaliculatum	(Lightfoot, 1786)	Channeled Top Snail
Calliostoma gloriosum	(Gould, 1849)	
Calliostoma ligatum	(Gould, 1849)	Blue Top Snail
Calliostoma spp.		
Calliostoma supragranosum	Carpenter, 1864	

TABLE 2.3-5

Current Species Name	Describer, Date	Common Name
Callistochiton crassicostatus	Pilsbry, 1893	
Callistochiton palmulatus	Pilsbry, 1893	
Ceratostoma foliatum	(Gmelin, 1791)	Leafy Hornmouth
Ceratostoma nuttalli	(Conrad, 1873)	Nuttall's Hornmouth
Cerithiopsis spp.		
Chaetopleura gemma	Dall, 1879	
Chama arcana	(Broderip, 1835)	
Chama spp.		
Chromodoris macfarlandi	Cockerell, 1902	MacFarland's Chromodorid
Conus californicus	Reeve, 1844	California Cone
Crassedoma giganteum	(Gray, 1825)	Rock Scallop
Crepidula adunca	Sowerby, 1825	Hooked Slipper Snail
Crepidula nummaria	Gould, 1846	White Slipper Snail
Crepidula perforans	(Valenciennes, 1846)	Western White Slipper Snail
Crepidula spp.		
Crepipatella lingulata	(Gould, 1846)	Half-Slipper Snail
Cryptochiton stelleri	(Middendorff, 1846)	Gumboot Chiton
Cuthona divae	(Marcus, 1961)	Rose-Pink Cuthona
Cyanoplax dentiens	(Gould, 1846)	
Cyanoplax hartwegii	(Carpenter, 1855)	
Cyanoplax spp.		
Cypraea spadicea	Swainson, 1823	Chestnut Cowry
Cystiscus jewettii	(Carpenter, 1857)	
Dendrodoris spp.		
Dendronotus albus	MacFarland, 1966	White Dendronotus
Dendronotus iris	Cooper, 1863	Giant Dendronotus
Dendronotus spp.		
Dendropoma lituella	(Mörch, 1861)	
Dendropoma spp.		
Diaulula sandiegensis	(Cooper, 1862)	Ringed Dorid
Diodora aspera	(Rathke, 1833)	Rough Keyhole Limpet
Diodora spp.		
Diplodonta orbella	(Gould, 1851)	Round Diplodonta
Dirona albolineata	Cockerell and Eliot, 1905	White-Lined Dirona
Discurria insessa	(Hinds, 1842)	
Doriopsilla albopunctata	(Cooper, 1863)	Salted Dorid
Doto kya	Marcus, 1961	
Elysia hedgpethi	Marcus, 1961	Hedgpeth's Elysia
Epilucina californica	(Conrad, 1837)	California Lucine
Erato spp.		
Erato vitellina	Hinds, 1844	Apple-Seed Erato

TABLE 2.3-5

Current Species Name	Describer, Date	Common Name
Eubranchus rustyus	(Marcus, 1961)	
Fissurella volcano	Reeve, 1849	Keyhole Limpet
Flabellina iodinea	(Cooper, 1862)	Spanish Shawl
Flabellina pricei	(MacFarland, 1966)	
Flabellina spp.		
Flabellina trilineata	(O'Donoghue, 1921)	Three-Lined Nudibranch
Fusinus luteopictus	(Dall, 1877)	Painted Spindle
Gari californica	(Conrad, 1837)	
Geitodoris heathi	(MacFarland, 1905)	Gritty Dorid
Glans subquadrata	(Carpenter, 1864)	Little Heart Clam
Granulina margaritula	(Carpenter, 1857)	
Haliotis cracherodii	Leach, 1814	Black Abalone
Haliotis kamtschatkana	Jonas, 1845	Pinto Abalone
Haliotis rufescens	Swainson, 1822	Red Abalone
Haliotis spp.		
Haliotis walallensis	Stearns, 1899	Flat Abalone
Haminoea spp.		Bubble Snail
Hancockia californica	MacFarland, 1923	
Hermissenda crassicornis	(Eschscholtz, 1831)	Thick-Horned Aeolid
Hiatella arctica	(Linnaeus, 1767)	Little Gaper
Hiatella spp.		
Hipponix cranioides	Carpenter, 1864	Hoof Snail
Hipponix spp.		
Homalopoma baculum	(Carpenter, 1864)	
Homalopoma luridum	(Dall, 1885)	
Homalopoma spp.		
Hopkinsia rosacea	MacFarland, 1905	Hopkin's Rose
Irus lamellifer	(Conrad, 1837)	Rock Venus
Ischnochiton radians	Carpenter in Pilsbry, 1892	
Ischnochiton regularis	(Carpenter, 1855)	
Ischnochiton spp.		
Katharina tunicata	(Woods, 1815)	
Kelletia kelletii	Forbes, 1852	Kellet's Whelk
Kellia laperousii	(Deshayes, 1839)	
Lacuna marmorata	Dall, 1919	Chink Snail
Lacuna spp.		
Lacuna unifasciata	Carpenter, 1857	
Laila cockerelli	MacFarland, 1905	Cockerell's Nudibranch
Lamellaria diegoensis	Dall, 1887	
Lasaea cistula	Keen, 1938	
Lepidopleurus rugatus	(Pilsbury, 1892)	
Lepidozona cooperi	(Pilsbry, 1892)	
Lepidozona mertensii	(Middendorff, 1846)	

TABLE 2.3-5

Current Species Name	Describer, Date	Common Name
Lepidozona retriporosa		
Lepidozona sinudentata	(Carpenter in Pilsbry, 1892)	
Lepidozona spp.		
Lima hemphilli	Hertlein and Strong, 1946	File Shell
Lirularia spp.		
Lithophaga plumula kelseyi	Hertlein and Strong, 1946	Date Mussel
Lithopoma gibberosum	(Dillwyn, 1817)	Red Top Snail
Littorina keenae	(Philippi, 1847)	Eroded Periwinkle
Littorina scutulata	Gould, 1849	Checkered Periwinkle
Littorina spp.		
Lottia asmi	(Middendorff, 1847)	Black Limpet
Lottia digitalis	(Rathke, 1833)	Ribbed Limpet
Lottia gigantea	Sowerby, 1834	Owl Limpet
Lottia instabilis	(Gould, 1846)	Unstable Seaweed Limpet
Lottia limatula	(Carpenter, 1864)	File Limpet
Lottia ochracea	(Dall, 1871)	
Lottia paradigitalis	(Carpenter, 1864)	
Lottia pelta	(Rathke, 1833)	Shield Limpet
Lottia spp.		
Macclintockia scabra	(Gould, 1846)	Rough limpet
Macoma nasuta	(Conrad, 1837)	
Macoma spp.		
Margarites salmoneus	(Carpenter, 1864)	
Marsenina stearnsii	(Dall, 1871)	
Maxwellia santarosana	(Dall, 1905)	
Megatebennus bimaculatus	(Dall, 1871)	Two-Spotted Keyhole Limpet
Megathura crenulata	(Sowerby, 1825)	Giant Keyhole Limpet
Melanella thersites	(Carpenter, 1864)	
Melibe leonina	(Gould, 1852)	Lion Nudibranch
Mexichromis porterae	(Cockerell, 1901)	Porter's nudibranch
Mitra idae	Melville, 1893	Ida's Mitra
Modiolus capax	(Conrad, 1937)	Fat Horse Mussel
Modiolus spp.		
Mopalia acuta		
Mopalia ciliata	(Sowerby, 1840)	
Mopalia hindsii	(Reeve, 1847)	
Mopalia lignosa	(Gould, 1846)	
Mopalia lowei	Pilsbry, 1918	
Mopalia muscosa	(Gould, 1846)	Mossy Chiton
Mopalia spp.		
Musculus pygmaeusv	Glynn, 1964	
Mytilimeria nuttalli	Conrad, 1837	

TABLE 2.3-5

Current Species Name	Describer, Date	Common Name
Mytilus californianus	Conrad, 1837	California Mussel
Mytilus galloprovincialis	(Linnaeus, 1758)	Bay Mussel
Mytilus spp.		
Nassarius mendicus	(Gould, 1850)	Lean Nassa
Nassarius spp.		
Navanax inermis	(Cooper, 1863)	
Nitidiscala spp.		
Nitidiscala tincta	(Carpenter, 1864)	Tinted Wentletrap
Norrisia norrisi	Sowerby, 1838	Norris's Top Snail
Nucella canaliculata	(Duclos, 1832)	Channeled Dogwinkle
Nucella emarginata	(Deshayes, 1839)	Emarginate Dogwinkle
Nucella spp.		
Nuttallina californica	(Reeve, 1847)	
Nuttallina spp.		
Ocenebra atropurpurea	Carpenter, 1865	
Ocenebra circumtexta	Stearns, 1871	Circled Rock Snail
Ocenebra foveolata	Hinds, 1844	
Ocenebra interfossa	Carpenter, 1864	Sculptured Rock Snail
Ocenebra lurida	(Middendorff, 1848)	Lurid Rock Snail
Ocenebra spp.		
Octopus spp.		
Odostomia spp.		
Okenia angelensis	Lance, 1966	
Olivella biplicata	(Sowerby, 1825)	Purple Olive Snail
Onchidella borealis	Dall, 1871	Leather Limpet
Opalia borealis	(Strong, 1937)	Chace's Wentletrap
Opalia funiculata	(Carpenter, 1857)	Sculptured Wentletrap
Opalia montereyensis	(Dall, 1907)	
Opalia spp.		
Parapholas spp.		Piddock
Penitella conradi	Valenciennes, 1846	Little Piddock
Petaloconchus montereyensis	Dall, 1919	
Phidiana hiltoni	(Lance, 1962)	Hilton's Aeolid
Pitar newcombianus		
Placiphorella velata	Dall, 1879	
Pododesmus cepio	(Gray, 1850)	Abalone Jingle
Protothaca laciniata	(Carpenter, 1864)	Rough-Sided Littleneck Clam
Protothaca staminea	(Conrad, 1837)	Common Littleneck Clam
Pseudochama spp.		
Pseudomelatoma torosa	(Carpenter, 1865)	Knobbed Drill
Rictaxis punctocaelatus	(Carpenter, 1864)	Striped Barrel Snail
Rostanga pulchra	MacFarland, 1905	Red Sponge Nudibranch

TABLE 2.3-5

Current Species Name	Describer, Date	Common Name
Rostanga spp.		
Searlesia dira	(Reeve, 1846)	Dire Whelk
Septifer bifurcatus	(Conrad, 1837)	Branch-Ribbed Mussel
Serpulorbis squamigerus	(Carpenter, 1857)	Scaled Worm Snail
Stenoplax fallax	(Pilsbry, 1892)	
Stenoplax heathiana	Berry, 1946	
Stenoplax spp.		
Tectura fenestrata	(Reeve, 1855)	
Tectura paleacea	(Gould, 1853)	Surfgrass Limpet
Tectura persona	(Rathke, 1833)	
Tectura rosacea	(Carpenter, 1864)	
Tectura scutum	(Rathke, 1833)	Plate Limpet
Tegula brunnea	(Philippi, 1848)	Brown Turban Snail
Tegula funebralis	(A. Adams, 1855)	Black Turban Snail
Tegula montereyi	(Kiener, 1850)	Monterey Turban Snail
Tegula pulligo	(Gmelin, 1791)	Dusky Turban Snail
Tegula spp.		
Tenellia spp.		
Tonicella lineata	(Wood, 1815)	Lined Chiton
Transennella spp.		
Transennella tantilla	(Gould, 1853)	
Tricolia compta	(Gould, 1855)	
Tricolia pulloides	(Carpenter, 1865)	
Tricolia spp.		
Trimusculus reticulatus	(Sowerby, 1835)	Reticulate Button Snail
Trinchesia albocrusta	(MacFarland, 1966)	
Triopha catalinae	(Sterns, 1873)	Sea-Clown Nudibranch
Triopha maculata	MacFarland, 1905	Spotted Triopha
Triopha spp.		
Tritonia festiva	(Stearns, 1873)	Diamondback Nudibranch
Trivia californiana	(Gray, 1827)	
Trivia solandri	(Sowerby, 1832)	Solander's Trivia
Trivia spp.		
Turbonilla spp.		
Velutina velutina	(Müller, 1776)	
Williamia peltoides	(Carpenter, 1864)	
Ectoprocta		
Aetea anguina	(Linnaeus, 1758)	
Alcyonidium polyoum	(Hassall, 1841)	
Antropora tincta		
Caulibugula ciliata	(Robertson, 1905)	
Cauloramphus spiniferum	(Johnston, 1832)	

TABLE 2.3-5

Current Species Name	Describer, Date	Common Name
Celleporaria brunnea	(Hincks, 1884)	
Costazia robertsonae	Canu and Bassler, 1923	
Crisia occidentalis	Trask, 1857	
Crisia spp.		
Dendrobeania laxa	(Robertson, 1905)	
Diaperoecia spp.		
Eurystomella bilabiata	(Hincks, 1884)	
Filicrisia franciscana	(Robertson, 1910)	
Filicrisia spp.		
Flustrellidra (=Flustrella) corniculata	(Smith, 1871)	
Heteropora spp.		
Hippodiplosia insculpta	(Hincks, 1882)	
Hippodiplosia spp.		
Hippothoa spp.		
Holoporella brunnea	(Hincks, 1884)	
Membranipora fusca	Osburn, 1950	
Membranipora spp.		
Microporella californica	(Busk, 1856)	
Microporella cribrosa	(Osburn, 1952)	
Microporella spp.		
Phidolopora pacifica	(Robertson, 1908)	
Phidolopora spp.		
Rhynchozoon spp.		
Scrupocellaria spp.		
Tricellaria occidentalis	(Trask, 1857)	
Tricellaria spp.		
Entoprocta		
Barentsia ramosa	(Robertson, 1900)	
Barentsia spp.		
Echinodermata		
Amphiodia occidentalis	(Lyman, 1860)	
Amphipholis spp.		
Amphipholis squamata	(Delle Chiaje, 1829)	
Asterina miniata	(Brandt, 1835)	Bat Star
Cucumaria spp.		
Dermasterias imbricata	(Stimpson, 1857)	Leather Star
Eupentacta quinquesemita	(Selenka, 1867)	
Henricia leviuscula	(Stimpson, 1857)	
Leptasterias hexactis	(Stimpson, 1862)	
Leptasterias spp.		

TABLE 2.3-5

Current Species Name	Describer, Date	Common Name
Leptosynapta albicans	(Selenka, 1867)	
Lissothuria nutriens	(Clark, 1901)	
Lytechinus spp.		
Ophioplocus esmarki	Lyman, 1874	Smooth Brittle Star
Ophioplocus spp.		
Ophiopteris papillosa	(Lyman, 1874)	
Ophiopteris spp.		
Ophiothrix spiculata	LeConte, 1851	Spiny Brittle Star
Ophiothrix spp.		
Orthasterias koehleri	(de Loriol, 1897)	
Parastichopus californicus	(Stimpson, 1857)	California Sea Cucumber
Parastichopus parvimensis	(Clark, 1913)	Sea Cucumber
Parastichopus spp.		
Pisaster brevispinus	(Stimpson, 1857)	Short-Spined Sea Star
Pisaster giganteus	(Stimpson, 1857)	Giant-Spined Sea Star
Pisaster ochraceus	(Brandt, 1835)	Ochre Star
Pisaster spp.		
Psolus chitonoides	Clark, 1902	
Pycnopodia helianthoides	(Brandt, 1835)	Sunflower Star
Strongylocentrotus franciscanus	(Agassiz, 1863)	Red Sea Urchin
Strongylocentrotus purpuratus	(Stimpson, 1857)	Purple Sea Urchin
Strongylocentrotus spp.		
Stylasterias forreri	(de Loriol)	
Ascidiacea		
Aplidium (=Amaroucium) californicum	(Ritter and Forsyth, 1917)	
Archidistoma diaphanes	(Ritter and Forsyth, 1917)	
Archidistoma molle	(Ritter, 1950)	
Archidistoma psammion	(Ritter and Forsyth, 1917)	
Archidistoma ritteri	(Van Name, 1945)	
Archidistoma spp.		
Ascidia ceratodes	(Huntsman, 1912)	
Ascidia spp.		
Boltenia villosa	(Stimpson, 1964)	
Chelyosoma productum	Stimpson, 1864	
Chelyosoma spp.		
Ciona intestinalis	(Linnaeus, 1767)	
Clavelina huntsmani	(Van Name, 1931)	Light-Bulb Tunicate
Cnemidocarpa finmarkiensis	(Kiger, 1893)	
Cystodytes lobatus	(Ritter, 1900)	Lobed Tunicate
Didemnum carnulentum	Ritter and Forsyth, 1917	
Distaplia occidentalis	Bancroft, 1899	

TABLE 2.3-5

Current Species Name	Describer, Date	Common Name
Distaplia smithi	Abbott and Trason, 1968	
Distaplia spp.		
Euherdmania claviformis	(Ritter, 1903)	
Lissoclinum caulleryi		
Metandrocarpa taylori	Huntsman, 1912	
Oikopleura spp.		
Perophora annectens	Ritter, 1893	
Pycnoclavella stanleyi	Berrill and Abbott, 1949	
Pyura haustor	(Stimpson, 1864)	
Ritterella aequalisiphonis	(Ritter and Forsyth, 1917)	
Ritterella pulchra	(Ritter, 1901)	
Ritterella spp.		
Styela montereyensis	(Dall, 1872)	Stalked Tunicate
Styela spp.		
Synoicum parfustis	(Ritter and Forsyth, 1917)	
Synoicum spp.		
Trididemnum opacum	(Ritter, 1907)	
Osteichthys		
Anarrhichthys ocellatus	Ayres, 1855	Wolf-Eel
Anoplarchus purpurescens	Gill, 1861	High Cockscomb
Apodichthys flavidus	Girard, 1854	Penpoint Gunnel
Artedius corallines	(Hubbs, 1926)	Coralline Sculpin
Artedius harringtoni	(Starks, 1896)	Scalyhead Sculpin
Artedius lateralis	(Girard, 1854)	Smoothhead Sculpin
Atherinopsis californiensis	Girard, 1854	Jacksmelt
Aulorhynchus flavidus	Gill, 1861	Tubesnout
Bathylagus ochotensis	Schmidt, 1938	Popeye Blacksmelt
Bathylagus pacificus	Gilbert, 1890	Pacific Blacksmelt
Bothragonus swanii	(Steindachner, 1876)	Rockhead
Brachyistius frenatus	Gill, 1862	Kelp Surfperch
Brosmophycis marginata	(Ayres, 1854)	Red Brotula
Cebidichthys violaceus	(Girard, 1854)	Monkeyface-Eel
Chilara taylori	(Girard, 1858)	Spotted Cusk-Eel
Chirolophis nugator	(Jordan and Williams, 1895)	Mosshead Warbonnet
Chromis punctipinnis	(Cooper, 1863)	Blacksmith
Clinocottus recalvus	(Greeley,1899)	Bald Sculpin
Cololabis saira	(Brevoort, 1857)	Pacific Saury
Coryphopterus nicholsii	(Bean, 1882)	Blackeye Goby
Cymatogaster aggregata	Gibbons, 1854	Shiner Surfperch
Damalichthys vacca	Girard, 1855	Pile Surfperch
Embiotoca jacksoni	Agassiz, 1853	Black Surfperch
Embiotoca lateralis	Agassiz, 1854	Striped Surfperch

TABLE 2.3-5

Current Species Name	Describer, Date	Common Name
Engraulis mordax	Girard, 1854	Northern Anchovy
Genyonemus lineatus	(Ayres, 1855)	White Croaker
Gibbonsia metzi	Hubbs, 1927	Striped Kelpfish
Girella nigricans	(Ayres, 1860)	Opaleye
Hemilepidotus spinosus	(Ayres, 1854)	Brown Irish Lord
Heterostichus rostratus	Girard, 1854	Giant Kelpfish
Hexagrammos decagrammus	(Pallas, 1810)	Kelp Greenling
Hyperprosopon anale	Agassiz, 1861	Spotfin Surfperch
Hypsopsetta guttulata	(Girard, 1856)	Diamond Turbot
Hypsurus caryi	Agassiz, 1853	Rainbow Surfperch
Jordania zanope	Starks, 1895	Longfin Sculpin
Lepidogobius lepidus	Girard, 1858	Bay Goby
Leptocottus armatus	Girard, 1854	Staghorn Sculpin
Lethops connectens	Hubbs, 1926	Kelp Goby
Liparis florae	(Jordan and Starks, 1895)	Tidepool Snailfish
Medialuna californiensis	(Steindachner, 1875)	Halfmoon
Merluccius productus	(Ayres, 1855)	Pacific Hake
Micrometrus aurora	(Jordan and Gilbert, 1880)	Reef Surfperch
Micrometrus minimus	(Gibbons, 1854)	Dwarf Surfperch
Neoclinus stephensae	Hubbs, 1953	Yellowfin Fringehead
Oligocottus rubellio	(Greeley, 1899)	Rosy Sculpin
Oncorhynchus tshawythscha	(Walbaum, 1792)	King Salmon
Ophiodon elongatus	Girard, 1854	Lingcod
Orthonopias triacis	Starks and Mann, 1911	Snubnose Sculpin
Oxyjulis californica	(Günther, 1861)	Senorita
Oxylebius pictus	Gill, 1862	Painted Greenling
Paralabrax clathratus	(Girard, 1854)	Kelp Bass
Paralichthys californicus	(Ayres, 1859)	California Halibut
Parophrys vetulus	Girard, 1854	English Sole
Phanerodon atripes	(Jordan and Gilbert, 1880)	Sharpnose Perch
Phanerodon furcatus	Girard, 1854	White Surfperch
Platichthys stellatus	(Pallas, 1787)	Starry Flounder
Pleuronichthys coenosus	Girard, 1854	C-O Turbot
Pleuronichtys verticalis	(Jordan and Gilbert, 1880)	Hornyhead Turbot
Porichthys notatus	Girard, 1854	Plainfin Midshipman
Psettichthys melanostictus	Girard, 1854	Sand Sole
Rathbunella hypoplecta	(Gilbert, 1890)	Smooth Ronquil
Rhacochilus toxotes	Agassiz, 1854	Rubberlip Surfperch
Rimicola muscarum	(Meek and Pierson, 1895)	Kelp Clingfish
Sardinops sagax	(Jenyns)	Pacific Sardine
Scorpaenichthys marmoratus	Girard, 1854	Cabezon
Scytalina cerdale	Jordan and Gilbert, 1880	Graveldiver
Sebastes atrovirens	(Jordan and Gilbert, 1880)	Kelp Rockfish

TABLE 2.3-5

Current Species Name	Describer, Date	Common Name
Sebastes auriculatus	Girard, 1854	Brown Rockfish
Sebastes carnatus	(Jordan and Gilbert, 1880)	Gopher Rockfish
Sebastes caurinus	Richardson, 1845	Copper Rockfish
Sebastes chrysomelas	(Jordan and Gilbert, 1881)	Black-and-Yellow Rockfish
Sebastes flavidus	Ayres, 1863	Yellowtail Rockfish
Sebastes melanops	Girard, 1856	Black Rockfish
Sebastes miniatus	(Jordan and Gilbert, 1880)	Vermilion Rockfish
Sebastes mystinus	(Jordan and Gilbert, 1881)	Blue Rockfish
Sebastes nebulosus	Ayres, 1854	China Rockfish
Sebastes paucispinis	Ayres, 1854	Bocaccio
Sebastes pinniger	(Gill, 1864)	Canary Rockfish
Sebastes rastrelliger	(Jordan and Gilbert, 1880)	Grass Rockfish
Sebastes serranoides	(Eigenmann and Eigenmann, 1890)	Olive Rockfish
Sebastes serriceps	(Jordan and Gilbert, 1880)	Treefish
Semicossyphus pulcher	(Ayres, 1854)	California Sheepshead
Spirinchus starksi	(Fisk, 1913)	Night Smelt
Stenobrachius leucopsarus	(Eigenmann and Eigenmann, 1890)	Northern Lampfish
Symphurus atricauda	(Jordan and Gilbert, 1880)	California Tonguefish
Synodus lucioceps	(Ayres, 1855)	California Lizardfish
Tarletonbeania crenularis	(Jordan and Gilbert, 1880)	Blue Lanternfish
Trachurus symmetricus	(Ayres, 1855)	Jack Mackerel
Typhlogobius californiensis	Steindachner, 1880	Blind Goby
Xerepes fucorum	(Jordan and Gilbert, 1880)	Rockweed Gunnel
Xiphister atropurpureus	(Kittlitz, 1858)	Black Prickleback
Xiphister mucosus	(Girard, 1858)	Rock Prickleback
Chondrichthys		
Cephaloscyllium ventriosum	Garman, 1880	Swell Shark
Myliobatis californica	Gill, 1865	Bat Ray
Platyrhinoidis triseriata	(Jordan and Gilbert, 1880)	Thornback
Raja binoculata	Girard, 1854	Big Skate
Raja inornata	Jordan and Gilbert, 1881	California Skate
Rhinobatos productus	(Ayres, 1854)	Shovelnose Guitarfish
Triakis semifasciata	Girard, 1854	Leopard Shark
Urolophus halleri	Cooper, 1863	Round Stingray

TABLE 2.3-6

COMMON AND SCIENTIFIC NAMES OF COMMERCIAL (C) AND RECREATIONAL (R) FISHES AND INVERTEBRATES COMMONLY CAUGHT IN CENTRAL CALIFORNIA (FROM REFERENCE 62)

Common name	Scientific name	C	R
Invertebrates			
Abalone, black		x	x
	Haliotis cracherodii		
Abalone, red	*Haliotis rufescens*	x	x
Crab, rock	*Cancer* spp.	x	x
Crab, shore			x
	Pachygrapsus crassipes		
Crab, shore	*Hemigrapsus* spp.		x
Limpet, owl		x	x
	Lottia gigantea		
Mussel, California	*Mytilus californianus*		
Mussel, bay	*Mytilus galloprovincialis*		
Octopus	*Octopus* spp.		
Scallop, rock	*Crassedoma giganteum*		x
Sea cucumber	*Parastichopus* spp.	x	x
Shrimp, bay	*Crangon stylirostris*	x	x
Squid, market	*Loligo opalescens*	x	x
Urchin, purple sea	*Strongylocentrotus purpuratus*	x	x
Urchin, red sea	*Strongylocentrotus franciscanus*	x	x
Whelk, Kelettis	*Kelletia kelletii*	x	x
Fish			
Anchovy, northern	*Engraulis mordax*	x	x
Bass, kelp	**Paralabrax clathratus**		x
Bass, striped	*Morone saxatilis*	x	x
Cabezon	*Scorpaenichthys marmoratus*	x	x
Flounder, starry	*Platichthys stellatus*	x	x
Greenling, kelp	*Hexagrammos decagrammus*	x	x
Greenling, painted	*Oxylibius pictus*		x
Halfmoon	*Medialuna californiensis*		x
Halibut, California	*Paralichthys californicus*	x	x
Jacksmelt	*Atherinops californiensis*	x	x
Kelpfish, giant	*Heterostichus rostratus*		x
Lingcod	*Ophiodon elongatus*	x	x
Mackerel, jack	*Trachurus symmetricus*	x	x

TABLE 2.3-6

Common name	Scientific name	C	R
Midshipman, plainfin	*Porichthys notatus*		x
Monkeyface-eel	*Cebidichthys violaceus*	x	x
Opaleye	*Girella nigricans*		x
Prickleback, rock	*Xiphister mucosus*		x
Ray, bat	*Myliobatis californica*	x	x
Rockfish, black	*Sebastes melanops*	x	x
Rockfish, black-and-yellow	*Sebastes chrysomelas*	x	x
Rockfish, blue	*Sebastes mystinus*	x	x
Rockfish, bocaccio	*Sebastes paucispinis*	x	x
Rockfish, brown	*Sebastes auriculatus*	x	x
Rockfish, China	*Sebastes nebulosus*	x	x
Rockfish, copper	*Sebastes caurinus*	x	x
Rockfish, gopher	*Sebastes carnatus*	x	x
Rockfish, grass	*Sebastes rastrelliger*	x	x
Rockfish, kelp	*Sebastes atrovirens*	x	x
Rockfish, olive	*Sebastes serranoides*	x	x
Rockfish, treefish	*Sebastes serriceps*	x	x
Rockfish, vermilion	*Sebastes miniatus*	x	x
Rockfish, yellowtail	*Sebastes flavidus*	x	x
Salmon, chinook	*Oncorhynchus tshawytscha*	x	x
Sandab, speckled	*Citharichthys stigmeaus*	x	x
Sardine, Pacific	*Sardinops sagax*	x	x
Seabass, white	*Astractoscion nobilis*	x	x
Senorita	*Oxyjulis californica*		x
Shark, leopard	*Triakis semifasciata*	x	x
Sheephead, California	*Semicossyphus pulcher*	x	x
Surfperch, black	*Embiotoca jacksoni*	x	x
Surfperch, pile	*Rhacochilus vacca*	x	x
Surfperch, rainbow	*Hypsurus caryi*	x	x
Surfperch, rubberlip	*Rhacochilus toxotes*	x	x
Surfperch, shiner	*Cymatogaster aggregata*		x
Surfperch, walleye	*Hyperprosopon argenteum*	x	x
Surfperch, white	*Phanerodon furcatus*	x	x
Topsmelt	*Atherinops affinis*	x	x
Turbot, C-O	*Pleuronichthys coenosus*	x	x
Wolf-eel	*Anarichthys ocelatus*	x	x

TABLE 2.3-7

SUMMARY OF SOME HISTORIC EFFECTS ON POPULATIONS OF MARINE ORGANISMS

Source of Effect	Date(s)	Species Most Affected	Nature of Effect	Reference(s)
El Nino climate effects	1976, '82, '83, '87, '93, '97, '98	algae and invertebrates of several species	population declines from mechanical disturbance during severe storm events and higher than normal water temperatures	5, 28, 76
Commercial fishing	1964 through 1977	abalone, red sea urchin and fin fish	population declines resulting from overharvesting	27
Power Plant construction	late 1960's through early 1970's	abalone, invertebrates and fin fish of several species	population declines due to siltation of intertidal and subtidal zones	26
Copper discharge from power plant	1974	abalone	toxicity related deaths of approximately 1,500 red and black abalone	27, 77
Sea Otter reestablishment	1973 to the present	abalone and sea urchin	increase in certain algae populations with declining urchin numbers; declining populations of cancer crabs, turbin snails and abalone due to predation by otters	27, 28
Power plant operation	1979 to present	a complex shift in marine species composition and relative abundance affecting a wide array of species and all trophic levels	elevated temperature discharge from power plant has changed marine habitat conditions favoring some species and causing declines in others; new species also attracted to area by warmer water temperatures	5

TABLE 2.3-7

Source of Effect	Date(s)	Species Most Affected	Nature of Effect	Reference(s)
Abalone withering syndrome	1988 to present	black abalone	population declines caused by a naturally occurring disease, possibly exacerbated by elevated temperature discharge from power plant	5, 57
Echinoderm wasting disease	1983-'84; 1993-'94; 1997	seastars of several genera	outbreak caused significant population declines; attributed to El Nino-caused warm coastal waters	4, 41, 54

TABLE 2.7-1

COMMUNITY ECONOMIC PROFILE FOR THE CITY OF SAN LUIS OBISPO, CALIFORNIA WITH ADDITIONAL INFORMATION ABOUT SAN LUIS OBISPO COUNTY

(taken from Reference 1)

Prepared by the Research Department of the San Luis Obispo Chamber or Commerce
March 2001

	1970	1980	1990	1992	1994	1996	1998	2000
City Population	28,036	34,252	42,136	42,480	43,919	41,943	42,941	43,050[a]
County Population	105,690	155,435	221,843	221,902	232,445	232,428	233,997	245,200
City Taxable [b] All Outlet Sales	$72,000	$248,800	$533,554	$460,620	$543,789	$593,809	N/A	695,615
County Taxable [b] All Outlet Sales	$164,500	$725,880	$1,730,511	$1,679,076	$1,740,152	$1,997,905	N/A	2,286,870
School Enrollment Grades K-6	2,895	3,415	4,485	4,507	4,573	4,496	4,466	4,482
School Enrollment Grades 7-12	2,541	3,489	3,222	3,368	3,536	3,761	4,127	4,087
Total City Dwellings	9,968	14,391	17,630	18,167	18,269	18,403	18,550	N/A

[a] Daytime population increases approximately 33,000. Approximately 9,000 college students included in this figure.
[b] In thousands of dollars.

Economy

A. The economy of San Luis Obispo remains stabilized due to high employment with government entities. As the single largest employer, it includes City, County and Federal agencies.

B. Other important segments of the economy are tourism and retail.

TABLE 2.7-1 Sheet 2 of 2

THE SAN LUIS OBISPO COUNTY LABOR MARKET

	County
A. Estimated Population (2001):	245,191
B. Median Family Income (2000):	$43,149
C. Estimated total employment (2001):	104,448
Services	23,379
Retail Trade	27,257
Government	23,000
Manufacturing (Durable)	4,180
Manufacturing (Non-Durable)	3,600
Finance/Real Estate/Insurance	5,297
Transportation/Communications	1,724/3,244
Construction	6,059
Agriculture	3,934
Wholesale Trade	2,774
D. County unemployment rate (2001):	3.0%

TABLE 2.8-1

NOISE MEASUREMENT RESULTS [A-WEIGHTED DECIBELS (dBA)]

Location	Average (L_{eq})	Average (L_{10})	Average (L_{50})	Average (L_{90})
Cooling Pond Fence Line	56	59	53	47
Under 500-kV Tower	58	59	44	55
Corner of Reservoir and Tribar Roads	57	60	54	48
Avila Gate	61	66	55	48

TABLE 2.8-2

ANNUAL AVERAGE DAILY TRAFFIC VOLUME (TWO-WAY)

Road	Daily Traffic Volume
US Highway 101	74,000 vehicles/day
State Highway 1	45,000 vehicles/day
Avila Beach Drive	5,400 vehicles/day
San Luis Bay Drive	5,020 vehicles/day

TABLE 2.10-1

DISTANCES AND DIRECTIONS TO ENVIRONMENTAL MONITORING STATIONS[a]

Station Code[c]	Station Name	Radial Direction[b] (True Heading) (Degrees)	Radial Distance[b] from Plant (km)	(Miles)
ØS1	Exclusion Fence-Northwest Corner	320	0.2	(0.1)
ØS2	North Gate	320	0.8	(0.5)
1S1	Wastewater Pond	330	0.6	(0.4)
2S1	Back Road-300 m North of Plant	0	0.3	(0.2)
3S1	Road NW of 230 kV Switchyard	23	0.6	(0.4)
4S1	Back Road between Switchyard	43	0.8	(0.5)
5S1	500 kV Switchyard	58	0.6	(0.4)
5S2	Diablo Creek Weir	65	1.0	(0.6)
5S3	Microwave Tower Road	70	1.0	(0.7)
6S1	Microwave Tower	94	0.8	(0.5)
7S1	Overlook Road	112	0.5	(0.3)
8S1	Target Range	125	0.8	(0.5)
8S2	Southwest Site Boundary (Sec. Met Tower)	128	1.8	(1.1)
9S1	Helicopter Pad/Patton Flat	167	0.6	(0.4)
MT1	Meteorological Tower	185	0.3	(0.2)
DCM	Diablo Cove	270	0.3	(0.2)
WN1	Field's Cove Overlook	290	0.3	(0.2)
7C2	Rattlesnake Canyon	124	7.5	(4.7)
7D1	Avila Gate	118	10.6	(6.6)
OUT	Plant Outfall	270	0.3	(0.2)
DW1	Drinking Water	On site	---	---

[a] Stations are shown in Figure 2.10-1.
[b] The reference point used is the dome of Unit 1 containment.
[c] Station Code (XYZ):

X - First number (0-9) represents the radial sector in which the station is located:

0 - Northwest
1 - North-northwest
2 - North
3 - North-northeast
4 - Northeast
5 - East-northeast
6 - East
7 - East-southeast
8 - Southeast
9 - South-southeast

Y - Letter (S, A-H) represents the distance from the plant:

S - On site
A - 0-2 miles from plant (but off-site)
B - 2-4 miles from plant
C - 4-6 miles from plant
D - 6-8 miles from plant
E - 8-10 miles from plant
F - 10-15 miles from plant
G - 15-20 miles from plant
H - Greater than 20 miles from plant

Z - Second number represents the station number within the zone.

Station Code (DCM, MT1, WN1,OUT, DW1):
The following stations do not follow the coding system: Diablo Cove Marine (DCM), Meteorological Tower (MT1), Northwest guard shack (WN1), Plant Outfall (OUT), and Drinking Water (DW1).

TABLE 2.10-2

TLD MEASUREMENTS – 1998 DATA

Station	Quarterly Exposure (mrem/qtr)	Total Annual Exposure (mrem/yr)
MT1	20.5	82.1
WN1	12.0	47.9
0S1	19.8	79.3
0S2	16.5	66.1
1S1	16.5	66.1
2S1	16.2	65.0
3S1	20.0	80.0
4S1	19.2	76.9
5S1	22.6	90.3
6S1	13.1	52.4
7S1	17.5	69.8
8S1	15.8	63.4
9S1	21.4	85.5
5S3	18.0	72.1
Average	17.8	71.2

TABLE 2.10-3

CORE SOIL SAMPLES[a]

Soil depth	Radium-226 (pCi/kg)	Actinium-228 (pCi/kg)	Potassium-40 (pCi/kg)
15 ft.	3.14×10^3	6.72×10^2	1.01×10^4
29 ft.	4.60×10^3	1.04×10^3	1.30×10^4
57 ft.	3.33×10^3	6.55×10^2	1.20×10^4

[a] Samples collected in May 1998. Soil depth is below current grade where soil sample was collected from the boring.

TABLE 2.10-4

VEGETATION (GRASS) SAMPLES[a]

Sample Location	Radium-226 (pCi/kg)	Berylium-7 (pCi/kg)	Actinium-228 (pCi/kg)	Potassium-40 (pCi/kg)
North	6.72×10^3	3.18×10^3	6.14×10^2	1.59×10^4
South	1.84×10^3	2.33×10^3	8.26×10^2	1.38×10^4

[a] Samples collected on June 17, 1999, from the vicinity of the ISFSI site.

TABLE 2.10-5

AVERAGE AIR PARTICULATE CONCENTRATIONS FOR 1998 SAMPLES

Air Sampling Stations	Average Gross Beta Concentration (pCi/m^3)
MT1	0.009
0S2	0.009
1S1	0.009
8S1	0.011
8S2	0.009
7D1	0.009