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FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

IN REPLY REFER TO
1-1-01-F-0114

June 27, 2003

Jack Blackwell
Pacific Southwest Regional Forester
Forest Service
1323 Club Drive
Vallejo, California 94592

Mike Poole
California State Director
Bureau of Land Management
2800 Cottage Way, Room W-1834
Sacramento, California 95825

Subject: Formal Endangered Species Consultation on the Pacific Gas and Electric Company Transmission Separation Project, located in the Plumas, Sequoia, and Sierra National Forests within Butte, Plumas, Madera and Fresno Counties; in the Redding, Folsom, and Bakersfield Districts within Madera, Fresno, Amador, Calaveras, Tuolumne, Nevada, Placer, Butte, Yuba, Shasta and Tehama Counties; and Various Other Jurisdictions, California.

Dear Messrs. Blackwell and Poole:

This is in response to the Forest Service's (FS) March 20, 2001, and Bureau of Land Management's (BLM) July 1, 2002, request for formal consultation with the U.S. Fish and Wildlife Service (Service) on the Pacific Gas and Electric Company Transmission Separation Project (Project) in the FS's Plumas, Sequoia, and Sierra National Forests, Butte, Plumas, Madera and Fresno Counties and in the BLM's Bakersfield, Folsom and Redding Bureau of Land Management Districts, Madera, Fresno, Amador, Calaveras, Tuolumne, Nevada, Placer, Butte, Yuba, Shasta and Tehama Counties, California.

The Service concurred with the FS's determination that the Project is not likely to adversely affect the bald eagle (*Haliaeetus leucocephalus*), California red-legged frog (*Rana aurora draytonii*) (frog), and Springville clarkia (*Clarkia springvillensis*) on November 21, 2000 (Service file 1-1-00-3149). However, also as stated in our November 21, 2000, letter to the FS,

the Service does not concur with the FS's determination that the proposed project is not likely to adversely affect the threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) (VELB). The Service concurs with the BLM's May 15, 2003, determination that the proposed action is not likely to adversely affect the bald eagle.

This document represents the Service's biological opinion on the effects of the action on the VELB, as described in our August 22, 2002, letter to the FS and memorandum to the BLM (Service files 1-1-02-I-3005 and 1-1-01-I-3006, respectively). This biological opinion has been prepared pursuant to section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*)(Act) and authorizes only incidental take of the VELB on FS, BLM, and private lands.

This biological opinion is based on information provided in, among other things: (1) Pacific Gas and Electric Company's October 1999, *Results of Habitat Assessments and Protocol-Level Field Surveys for the California Red-legged Frog (*Rana aurora draytonii*) Conducted for the Transmission Line Separation Project*; (2) FS's August 2000 *Biological Assessment of Potential Effects of the Pacific Gas and Electric Company Transmission Line Separation Project on Federally Listed Endangered or Threatened Wildlife Species* (Wildlife BA); (3) FS's August 2000, *Biological Assessment of Potential Effects of the Pacific Gas and Electric Company Transmission Line Separation Project on Federally Listed Endangered or Threatened Plant Species* (Plant BA); (4) FS's March 20, 2001, *Addendum to Biological Assessment of Potential Effects of the Pacific Gas and Electric Company Transmission Line Separation Project on Federally Listed Endangered or Threatened Wildlife Species* (Addendum); (5) Pacific Gas and Electric Company's November 19, 2001, *Additional Information on Valley Elderberry Longhorn Beetle for the Pacific Gas and Electric Company Transmission Separation Project*; (6) BLM's July 1, 2002, request for formal consultation; 7) BLM's April 2003 Biological Assessment of Potential Effects of the Pacific Gas & Electric Transmission Separation Project on Threatened Valley Elderberry Longhorn Beetle and Other Listed Species; (8) Garcia and Associates' November 27, 2002 *Valley Elderberry Longhorn Beetle Surveys on Properties Associated with Pacific Gas and Electric Company's Transmission Separation Project*; (9) Garcia and Associate's March 2003 *Supplemental Biological Surveys on BLM Lands Affected by PG&E's Transmission Separation Project* and its March 2003 revision; (10) Pacific Gas and Electric Company and the Service's September 13, 2002 *VELB Conservation Program*, as amended in March 2003; and (11) other published and unpublished sources of information. A complete administrative record of this consultation is on file in our office.

Consultation History

May 6, 1998. The Service provided Pacific Gas and Electric Company with a species list during a meeting in Sacramento for the proposed action in the Eldorado, Plumas, Sequoia, Shasta-Trinity, Sierra, Stanislaus and Tahoe National Forests.

November 30, 1999. Pacific Gas and Electric Company submitted to the Service California red-legged frog habitat assessment and protocol-level surveys for the Project. Enclosed was a copy

of the Results of *Habitat Assessments and Protocol-Level Field Surveys for the California Red-legged Frog (*Rana aurora draytonii*) Conducted for the Transmission Line Separation Project.*

July 5, 2000. Pacific Gas and Electric Company gave the Service a draft biological assessment (BA) with proposed reasonable and prudent measures for the VELB at a meeting in Sacramento. Enclosed was a copy of the *Biological Assessment for Pacific Gas and Electric Company Transmission Separation Project.*

September 5, 2000. The Service received a letter dated August 31, 2000, from the FS requesting informal consultation for the Pacific Gas and Electric Company Project. The FS issued two biological assessments (wildlife and botanical) for the Project and submitted a request for the Service's concurrence on the determination that the proposed authorization of the Project is not likely to adversely affect the bald eagle, California red-legged frog, VELB, and Springville clarkia. Enclosed was a copy of the Wildlife BA and Plant BA.

October 3, 2000. The Service requested additional information during a meeting with Pacific Gas and Electric Company concerning the occurrence of VELB habitat (elderberry plants: *Sambucus* spp.) in the Project area and an annual estimate of effects on plants based on Project maintenance activities.

November 21, 2000. The Service sent FS a letter of non-concurrence for the VELB and request for formal endangered species consultation on the authorization of the Project (Service file 1-1-00-I-3149). The Service concurred with the determination that the Project is not likely to adversely affect the bald eagle, California red-legged frog or Springville clarkia.

March 23, 2001. The Service received a letter dated March 20, 2001, from the FS requesting formal consultation on the VELB in the Plumas, Sequoia, and Sierra National Forests. In response to the Service's November 21, 2000, letter (Service file 1-1-00-I-3149) of nonconcurrence for the VELB and the October 3, 2000, meeting when additional VELB information was requested, the FS submitted an addendum to the wildlife biological assessment detailing VELB habitat and estimates of Project effects. Enclosed was a copy of the *Addendum to Biological Assessment of Potential Effects of the Pacific Gas and Electric Company Transmission Line Separation Project on Federally Listed Endangered or Threatened Wildlife Species.*

October 18, 2001. The Service received a letter dated October 17, 2001, from Pacific Gas and Electric Company concerning the biological opinion (BO) preparation. Pacific Gas and Electric Company proposed Foster-Wheeler, a third party contractor, prepare the BO under the direction of the Service.

November 14, 2001. The Service received a letter dated November 14, 2001, from Pacific Gas and Electric Company that addressed an October 23, 2001, telephone conversation concerning conductor spacing and voltage on the existing lines in the Project. The Pacific Gas and Electric Company stated that they are conforming to the Avian Power Line Interaction Committee

(APLIC) bird safe guideline of 60-inch minimum conductor spacing to prevent raptor electrocution and are replacing the single 12kV line with one at least 70kV (APLIC 1996).

November 19, 2001. The Service received a letter, via electronic mail attachment, dated November 19, 2001, from Foster-Wheeler, a third party contractor, that provided additional information in the forms of observations and assumptions concerning the Service's July 9, 1999, *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (Conservation Guidelines). Attached was a copy of the document entitled *Additional Information on Valley Elderberry Longhorn Beetle for the Pacific Gas and Electric Company Transmission Separation Project.*

February 28, 2002. The Service met with Pacific Gas and Electric Company staff to begin development of a comprehensive conservation program to address the Project's potential adverse effects on the VELB. Subsequent discussions between the Pacific Gas and Electric Company and the Service, and the FS and BLM regarding the proposed program occurred through January 2003.

July 1, 2002. BLM requested formal consultation.

September 10, 2002: The Service issued a biological opinion to the Bureau of Reclamation (Service file 1-1-02-F-0298) to allow the Pacific Gas and Electric Company to prune elderberry shrubs at New Melones Lake, Tuolumne County, California, under the aegis of the impending VELB Conservation Program document.

September 13, 2002: Pacific Gas and Electric Company submitted to the Service the final draft of the VELB Conservation Program document. The Service's formal adoption of this document and its March 2003 amendments will occur upon issuance of this biological opinion.

November 19, 2002. The Service received a draft *Work Plan for Collecting Information on the Occurrence of Valley Elderberry Longhorn Beetle*, prepared by Jones and Stokes Associates for the Pacific Gas and Electric Company.

January 10, 2003. A final Memorandum of Understanding was executed between the Pacific Gas and Electric Company, Service, FS, and BLM, defining the respective roles of each party in the consultation and subsequent implementation of the proposed project. The Pacific Gas and Electric company henceforth gained status as a non-Federal applicant under the Act and its implementing regulations.

February 19, 2003: Pacific Gas and Electric Company provided the Service with initial refinements in VELB effects based on changes in BLM land acreage brought about by active Public Land exchange and disposal programs.

February 20, 2003: A near-final draft biological opinion was transmitted by the Service via electronic mail to representatives of the FS, BLM, and Pacific Gas and Electric Company and their private counsel.

February 21, 2003: The BLM provided the Service with written comments on the near-final draft biological opinion.

March 11, 2003: The Pacific Gas and Electric Company provided the Service with an electronic version of the final VELB Conservation Plan, including revised data for BLM public lands. This concluded the BLM effects revision initiated on February 19, 2003.

March 12, 2003: The Pacific Gas and Electric Company provided the Service with comments on the near-final draft biological opinion via electronic mail.

April 14 and 18, 2003: The Pacific Gas and Electric Company transmitted an electronic version of a draft Biological Assessment for public lands and accompanying data to the BLM.

May 15, 2003: The BLM transmitted an April 2003 final biological assessment (BLM BA) to the Service. The BLM BA's transmission memorandum contained additional comments on the near-final draft biological opinion. Service and BLM staff discussed the memorandum further and on May 19, 2003, the BLM transmitted final comments and clarifications.

BIOLOGICAL OPINION

Description of the Proposed Action

Background and Action Area

Pacific Gas and Electric Company has t a 70,000 square mile service area in northern and central California that includes approximately 113,000 miles of transmission and distribution lines and associated facilities to distribute electricity across the service area and over 42,700 miles of pipeline and associated facilities are used to transmit and distribute natural gas. Portions of these facilities cross various national forests administered by the FS, and certain public lands administered by the BLM, Federal lands surrounding Bureau of Reclamation facilities, and privately-owned lands. These public and private lands constitute the action area for the proposed project.

On December 22, 1998, the Federal Energy Regulatory Commission (FERC) granted license amendments to remove certain non-primary transmission lines and associated facilities located on National Forest System and BLM-administered lands from Pacific Gas and Electric Company's hydroelectric licensed projects (85 FERC §61, 411). FERC also issued two subsequent orders on May 16, 2000, incorporating two existing transmission only facilities located on Forest System lands into the Transmission Separation Project (93 FERC § 62,113 and ¶ 62,114) effective when Pacific Gas and Electric Company receives land use authorization from the FS and the BLM, as appropriate. This "Transmission Separation Project" involves continued occupancy, use and maintenance of existing transmission facilities in ten right-of-way (ROW) corridors occupying approximately 861 acres of National Forest System lands in the Shasta-Trinity, Plumas, Tahoe, Eldorado, Stanislaus, Sierra, and Sequoia national forests as well as

approximately 142 acres of public land within the BLM administered Bakersfield, Folsom and Redding Districts. The term of the respective land entitlements is up to 30 years.

On July 28, 1998, and November 5, 1998, Pacific Gas and Electric Company applied to the FS and the BLM, respectively, for a 30-year authorization to continue to use and maintain these existing transmission facilities. The corridors on Forest Service lands contain existing transmission towers or poles, conductors and associated electrical equipment, which range in voltage from 12kV to 230kV (Table 1). The corridors on BLM lands include existing transmission towers or poles, conductors and associated electrical equipment which range in voltage from 60kV to 230kV (Table 2). Elderberry (*Sambucus* spp.) are only known to occur sporadically on existing right-of-way corridors covering 646 acres within the Plumas, Sierra and Sequoia National Forests and approximately 142 acres of land administered by the BLM.

Table 1. List of National Forests and associated transmission corridors for Pacific Gas and Electric Company Transmission Separation Project.

FERC No.	Hydro Project Name	Transmission Line	Total Acres of FS Lands within Trans. Corridors
#137	Mokelumne	Salt Springs – Tiger Creek 115 kV	72.88
#184	Eldorado	Eldorado – Missouri Flat 1 and 2 115 kV	43.89
#233	Pit 3, 4 and 5	Pit 3 230 kV	23.12
#619	Bucks Creek	Bucks Creek – Rock Creek Junction 230 kV	31.9
#1333	Tule River	Tule – Springville 70 kV	39.78
#1354	Crane Valley	San Joaquin No 3 – Crane Valley 1101 Circuit 12 kV, Wishon to San Joaquin No 3 70 kV, Wishon to Coppermine 70 kV	59.25
#1962	Rock Creek Cresta	Rock Creek PH Tap 230 kV Cresta PH Tap 230 kV	21.74
#1988	Haas - Kings River	Haas – Woodchuck 70 kV Haas – McCall 230 kV Balch – McCall 230 kV	145.97
#2105	UNF Feather River	Caribou – Big Bend Sub 115 kV	328.24
#2118	Donnells – Curtis T/L	Donnells – Curtis 115 kV	69.18
#2130	Spring Gap - Stanislaus	Stanislaus – Manteca No. 1 115kV; Stanislaus – Newark No. 1 and 2 115kV	2.74
#2310	Drum - Spalding	Drum to Halsey Jct. 1 and 2 115kV;	6.61
#2281	Woodleaf – Palermo T/L	Woodleaf – Palermo 115 kV	18.81

Table 2. List of BLM lands and associated transmission corridors for Pacific Gas and Electric Company Transmission Separation Project.

FERC No.	Hydro Project Name	Transmission Line	Total Acres of BLM Lands within Trans. Corridors
#96	Kerckhoff 1 and 2	Kerckhoff - Le Grand 115 kV; Kerckhoff 1- Kerckhoff 2 115kV; Kerckhoff - Clovis No. 1 and 2 115kV	15.87
#137	Mokelumne	Tiger Creek – Newark No. 1 and 2 230 kV; WestPoint – Stockton 60kV	59.74
#803	De Sabla - Centerville	De Sabla to Oroville 60kV	17.95
#1121	Battle Creek	Coleman – Coleman Junction 60kV; Inskip – Coleman 60kV; Volta – Deshutes 60kV; South – Inskip 60kV	44.62
#1354	Crane Valley	Wishon to Coppermine 70kV	5.02
#2130	Spring Gap - Stanislaus	Stanislaus – Manteca No. 1 115kV; Stanislaus – Newark No. 1 and 2 115kV	21.77
#2310	Drum - Spalding*	Drum to Halsey Jct. 1 and 2 115kV; Drum to Alta to Colfax Jct. 69kV; Dutch Flat to Halsey Jct. 115kV; Chicago Park to Halsey Jct. (NID) 115kV	42.20**
#1962	Rock Creek - Cresta	Rock Creek – Rio Oso 1 and 2 230kV	11.14**
#1988	Haas - Kings River	Balch No.2 – McCall 230kV	ca. 1.5

*Existing BLM Right of Way Grants
** Approximately 11.6 to 14.5 acres of this corridor are situated at ca. 3,400 feet, above the nominal elevation range of VELB.

During the course of the consultation, it became apparent that a greater scope of actions should be analyzed in the biological opinion due to, among other things, the unique nature of certain line separation project actions (specifically the effects of routine operations and maintenance on the VELB), which will occur throughout Pacific Gas and Electric Company's transmission and distribution system, regardless of land ownership, and the impracticability of addressing these effects through existing Service Guidelines. Thus, a comprehensive region-wide conservation strategy appeared to be the most sound approach to addressing potential adverse effects on the VELB. This overall conservation strategy is beyond the scope of the FS or BLM-administered lands, but it cannot be readily separated into sub-plans for each jurisdiction. The conservation strategy is an inseparable element of the Project description.

As a result, this consultation has been expanded to include the Pacific Gas and Electric Company's gas and electric service area that overlaps with the potential range of the VELB. This range covers 33,633 square miles and encompasses California's Central Valley, the 3,000-foot contour to the valley's east (Service 1999), and the Central Valley watershed divide to the west (the western valley watershed boundary often exists at altitudes of less than 3,000 feet). The Pacific Gas and Electric Company's linear facilities (those associated with transmission and distribution of gas and electricity, including those located on National Forest System lands and BLM-administered lands) within the potential range of the VELB are summarized in Table 3. These facilities include approximately 55,500 circuit miles of electric transmission and distribution line, the supporting poles and towers, and approximately 648 electrical substations of various size and capacity. There are more than 4,180 miles of gas transmission line within the

project area, linked to 1,470 related facilities of various size and function. These gas facilities include testing stations, metering stations, valve lots, compressor stations, pressure limiting stations, and storage facilities. Additionally, there are more than 10,000 linear miles of existing gas distribution lines. A large portion of the gas distribution system, however, is situated in urban areas.

The project area includes the transmission lines associated with FERC-licensed projects owned and operated by the Pacific Gas and Electric Company, as well as various linear facilities associated with hydroelectric generation projects (e.g., canals, penstocks, dams, weirs, flumes, culverts, powerhouses, and recreational facilities). Within the potential range of the VELB, linear features (e.g., canals, ditches, penstocks, etc.) associated with FERC hydroelectric generation projects amount to less than 200 miles. The Project area encompasses a broad range of habitat types, from annual grassland-oak habitat in the lower elevations to pine-oak woodlands and mixed conifer forest in higher elevations.

Table 3. Length and classification of linear gas and electric facilities and proportion of those facilities within potential range of the VELB

Electric Transmission			
Voltage	Total Circuit Miles	Circuit Miles Within VELB Range	Percent Circuit Miles Within VELB Range
115 kV	6,086.2	3,558.9	58.5
230 kV	5,329.3	3,471.0	65.1
60 kV	3,956.0	1,974.0	49.9
70 kV	1,548.7	1,349.0	87.1
500 kV	1,329.0	1,005.5	75.7
idle (unidentified)	250.0	115.0	46.0
unknown	12.8	11.8	92.6
Total	18,512.0	11,485.2	62.0
Electric Distribution			
Voltage	Total Circuit Miles	Circuit Miles Within VELB Range	Percent Circuit Miles Within VELB Range
12.0 kV	64,744.8	36,623.2	56.6
21.0 kV	11,835.9	4,955.4	41.9
17.2 kV	2,569.6	2,150.6	83.7
4.16 kV	1,529.2	161.4	10.6
2.4 kV	358.2	10.7	3.0
7.2 kV	260.5	66.7	25.6
4.8 kV	61.1	58.1	95.1
44.0 kV	24.8	0.1	0.4
22.0 kV	21.8	5.1	23.2
480 volts	0.1	0.1	100.0
Total	81,405.8	44,031.3	54.1
Gas Transmission			

Pipeline Type	Total Line Miles	Line Miles Within VELB Range	Percent Line Miles Within VELB Range
Local transmission	2,582.6	1,413.9	54.7
Backbone transmission	2,007.1	1,053.6	52.5
Distribution feeder main	1,472.3	846.5	57.5
Gas Gathering	522.8	498.3	95.3
Distribution	232.1	210.0	90.5
Service line	183.8	99.7	54.3
Standard Pacific (joint w/ Chevron)	54.5	20.8	38.1
Underground storage	37.0	35.1	95.0
Blow-down	4.6	2.2	47.1
Total	7,096.9	4,180.0	58.9

Pacific Gas and Electric Company system activities include routine operation and maintenance activity associated with Company transmission facilities on National Forest lands, as described in Transmission Separation Project documents previously submitted to the Service (Foster Wheeler Environmental Corporation 2000a, 2000b, and 2001). In addition to the aforementioned Transmission Separation Project related activities on FS lands, system activities include routine operation and maintenance activity associated with Pacific Gas and Electric Company's facilities within rights-of-way on BLM land, and within rights-of-way, franchises, and easements on other land classifications, including private land not owned by the Pacific Gas and Electric Company. These activities include routine vegetation and non-vegetation management activities (including the use and maintenance of the roads necessary to access the transmission facilities), and to conduct emergency maintenance activities, if needed, as summarized below. These activities are also identified in Table 4 and discussed in more detail in the VELB Conservation Program, Appendix A. Pacific Gas and Electric Company has conducted similar activities with the transmission facilities for the past 30 years. The Company does not intend to undertake any major projects or construction activities such as new electric pole/tower construction, substation expansion, new pipeline installation, or pressure limiting station construction as part of this program. These activities will be subject to separate authorizations.

Operation and maintenance of the Pacific Gas and Electric Company's electrical and natural gas facilities are performed according to standard industry procedures and in accordance with the requirements of State of California law for public health and safety, including California Public Utilities Commission General Order 95, Rule 35, Public Resources Code 4293 (Tree Trimming and Removal), Public Resources Code 4292, and California Public Utilities Commission (CPUC) General Order 112-E, to keep facilities clear of trees and other fire hazards and to inspect and prevent damage to natural gas systems. Their legal requirements are discussed in more detail in the VELB Conservation Program and are incorporated herein by reference. Other government requirements specify maintenance practices to prioritize, inspect, and maintain overhead electrical transmission lines placed under the control of the California Independent System Operator. These state requirements were also developed to protect public health and safety.

Electric System Vegetation Management Activity. Vegetation management activity includes routine inspections of linear facilities and identification of potential hazards/trees that may violate conductor clearance laws and requirements. The degree of needed vegetation management often depends upon type (voltage) of facility involved and the height of the conductor lines. Management of such vegetation may include cutting, trimming, pruning, or clearing vegetation by manual or mechanical means as well as directed herbicide applications or stump treatments (except on FS lands covered by the Transmission Separation Project or as otherwise authorized) to comply with state laws and requirements, protect the integrity of Pacific Gas and Electric Company facilities, and/or maintain safe and reliable access to Company facilities for purposes of inspection and operation. Routine electric system-related activity to manage vegetation also includes clearing of brush, shrubs, and saplings around certain water conveyance/storage facilities (e.g., penstocks, dams, weirs, flumes, culverts, *etc.*) to protect their structural integrity and/or maintain safe access for routine inspection, operation, and maintenance purposes.

Gas System Vegetation Management Activity. Gas line rights-of-way are generally cleared of all vegetation and brush during initial construction of the gas pipelines. Although existing Rights of Way (ROWs) are maintained in a state of reduced vegetative cover, trees and brush that grow into these areas and interfere with these patrols may require periodic trimming and/or removal to prevent damage to the natural gas system and facilitate inspections. Areas within the right-of-way requiring vegetation management are identified during routine patrols, typically at least once or twice per year. Vegetation management is usually accomplished by mechanically or manually removing large-diameter woody stems or other vegetation to achieve a maximum height of 1 foot or less. The vegetation management program is also designed to eliminate weeds, brush, and trees around gas-related facilities to reduce fire hazard, improve safety, and maintain access, including aerial inspection of the right-of-way.

Non-Vegetation Management Activities. Additional routine maintenance activities for gas and electric systems have the potential to affect elderberry plants. These additional activities are also listed in Table 4 and discussed in more detail in Appendix A of the VELB Conservation Program. Additional routine maintenance activities for the electric system include aerial inspections, ground inspections, wood pole test and treat, insulator replacement, cross arm replacement, anchor/guy replacement, incidental pole replacement, and road maintenance (occasional blading of existing roads). Routine maintenance activities for the gas system include aerial and ground inspections of pipelines and related facilities, remedial maintenance, compressor station maintenance, electric test system installation, valve recoating, valve replacement, installation of cathodic protection, coating replacement, telecommunications site maintenance, and access road maintenance.

Emergency Activities. Emergency activities may be required in the event of disaster or acts of God (50 C.F.R. § 402.05). Events such as fire, landslides and intense storms may disable electric and/or gas transmission. Emergency activities would include any of the activities described above undertaken in response to a sudden unusual occurrence such as, but not limited to, fire, wind, flood, earthquake or other soil movement, riot, accident, or damage to a subsurface installation requiring immediate action to prevent or mitigate loss of, or damage to, life, health,

property or essential public services. In these events, Pacific Gas and Electric Company would notify the Service and the FS and/or the BLM, as appropriate, as soon as possible after the activities taken to restore electric power and/or gas service.

Table 4. Proposed routine operation, maintenance and emergency activities.

Electric O&M Activities	
E1	Patrols; aerial, ground
E2	Inspections; tower, pole, and equipment; outage; substation
E3	Electric Insulator Washing
E4	Electric Substation Maintenance
E5	Electric System Outage Repair
E6	Electric System Tower/Pole Replacement or Repair
E7	Facility Installations (Shoo-Fly)
E8	Electric System Pole and Equipment Replacement or Repair
E9	Electric Line Reconductoring
E10	Vegetation Management
E11	Wood Pole Test and Treat
E12	Access Road Maintenance
Gas O&M Activities	
G1	Patrols; aerial, ground, leak detection
G2	Inspections; valves, telecom sites, anode beds
G3	Remedial Maintenance
G4	Compressor Station Maintenance
G5	Pipeline Electric Test System Installation
G6	Pipeline Valve Recoating
G7	Pipeline Valve Replacement
G8	Pipeline Cathodic Protection
G9	Pipeline Lowering
G10	Pipeline Coating Replacement
G11	Pipeline Replacement
G12	Pipeline Telecommunications Site Maintenance
G13	Vegetation Management
G14	Access Road Maintenance
Emergency Activities include the above activities performed under emergency circumstances.	

Description of the Proposed Avoidance, Minimization, and Conservation Measures

The Pacific Gas and Electric Company, with Service input, has developed a comprehensive program to address potential VELB effect issues on lands included in the Transmission Separation Project and on other lands that are affected by similar routine operation and maintenance activities throughout the Pacific Gas and Electric Company service area, and provide funds for VELB recovery plan efforts in California.

Because habitat modification is thought to be one of the leading causes of the VELB's rarity, the intent of the VELB conservation program is to increase or improve VELB habitat through acquisition, development, and/or protection of lands in those areas expected to be the most productive and most at risk, such as along major drainages within the range of the VELB. In order to achieve the desired conservation benefits associated with this conservation program, and consistent with the VELB Recovery Plan (Service, 1984), Pacific Gas and Electric Company will provide incremental funding over eight years, in an escrow or other appropriate account, for acquisition and/or long-term management of up to 1,000 acres of high quality habitat near or adjacent to existing VELB populations of the Sacramento and San Joaquin Valleys. Thus, the acquisition and/or long-term management of 125± acres/year, on an average annual basis, is anticipated, subject to acquisition and management opportunities. These conservation areas will be selected in consultation with the Service, FS, and BLM. Property acquisition and/or long-term management activities will begin within 18 months of issuance of the Biological Opinion and after appropriate habitat identification (discussed below). The properties will be selected based upon the presence of elderberry plants and associated habitat and, if appropriate, the potential for the addition of elderberry plants.

In order to determine the most beneficial habitat areas, the Pacific Gas and Electric Company and the Service, in coordination with FS and BLM, will identify available properties in high quality, priority conservation areas, where VELB protection and restoration activities will improve the long-term viability of the species, near or adjacent to existing VELB habitat. Once prime VELB areas are identified, the tools used in this conservation effort may include, but are not limited to, fee purchase, conservation easement, and dedication of Pacific Gas and Electric Company's fee properties, as well as efforts to preserve, protect, manage, enhance or otherwise take advantage of other available opportunities to consolidate and connect corridors of riparian habitat along California's rivers to ensure VELB survival and recovery, in cooperation with other public and private conservation organizations.

The conservation program also includes required environmental training and education for Pacific Gas and Electric Company personnel and contractors, as well as various requirements to protect, avoid and/or minimize effects on VELB, including flagging areas to avoid VELB habitat, certain limitations on the use of pesticides (where use of pesticides are permitted) near VELB habitat, directional felling of hazard trees, and erosion control, as well as monitoring and reporting of Pacific Gas and Electric Company activities that may affect VELB to the Service. Additionally, the Company has committed to an integrated vegetation management program on its rights-of-way and employs best management practices that are designed to protect wildlife, groundwater, surface water, soils and the general public.

Status of the Species/Critical Habitat

Species/Critical Habitat Description

The VELB, a woodborer, is dependent on its host plant, elderberry, which is a common component of the remaining riparian forests and adjacent grasslands of the Central Valley, and of the elderberry savanna which borders riparian forests in some areas. The VELB appears to be

only locally common, found in population clusters that are not evenly distributed across available habitat. The VELB was listed as a threatened species by the Service on August 8, 1980 (45 **Federal Register (FR)** 52803-52807), pursuant to provisions of the Act, as amended, because the habitat of the species had largely disappeared throughout much of its former range due to, among other things, agricultural conversion, levee construction, and stream channelization. At the time of listing, the beetle was only known from the valley areas of California in Sacramento, Solano, Yolo, and Merced counties (Service 1980). Beetle habitat was described as elderberry thickets in moist valley oak woodland along the margins of the Sacramento and San Joaquin Rivers in California's Central Valley. Two Critical Habitat areas were designated along portions of the American River in Sacramento County (Service 1980). Important VELB habitat was also identified along Putah Creek in Solano County. Elderberry of various species occur throughout California, up to elevations of 10,000 feet. The current range of the VELB, however, encompasses California's Central Valley, the Central Valley watershed to the west, and the 3,000-foot contour to the east (Service 1999). The *Valley Elderberry Longhorn Beetle Recovery Plan* (Recovery Plan) was issued in 1984 (Service 1984).

Life History

Adult VELB lay their eggs in the bark of living elderberry plants and larvae bore into the pith of stems (Lindsley and Chemsak 1972). A variety of branch sizes are utilized for larval development and pupation although most of those measured in Barr's study (1991) were 2 – 4 inches in diameter at the exit hole. Infrequently, smaller branches (less than 1.5 inches in diameter) that contained exit holes were encountered. Lang *et al.* (1989) found no current-year exit holes on stems less than 2.5 cm (1 inch). Thus, larvae appear to be distributed mostly in large, mature plants with stems greater than 1.0 inch in diameter near ground level. Larvae feed within the stems and emerge from pupation as adults after at least 14 months (Halstead 1990) through a 7-10mm exit hole (Barr 1991) in spring at about the same time the elderberry plants are blooming. The entire life cycle from egg to adult was previously thought to take two years (Service 1984; Eng 1984), though the duration of each stage in the cycle is unknown. Barr (1991) observed beetles feeding on elderberry leaves under laboratory conditions. However, data on feeding preferences, reproductive behavior, or mechanisms of host-plant location under natural conditions are unavailable.

Though use of the plants by the VELB is rarely apparent, plants used by the VELB usually show evidence of repeated use over a period of several years, but sometimes only one or two exit holes are present (Jones and Stokes 1987). Exit holes are often the only evidence of beetle presence or, at least, historic occupation of a plant. A review of exit hole data shows the tendency for VELB to utilize lower portions of elderberry plant stems. Barr (1991), from a survey of 122 exit holes, found mean exit hole height to be 38.8 inches. Almost 71 percent of all holes were 48 inches or less in height. These results compare to Eya (1976), Jones & Stokes (1987), and Andrews *et al.* (1987). Jones and Stokes estimated stem heights at 627 exit holes and found that nearly 70 percent were at or below 4 feet, and only about 10 percent were higher than 6 feet. Andrews *et al.* found *D. californicus* holes from ground level up to 7 feet high – of 133 measurements, approximately 65 percent were less than 3 feet high, and approximately 35 percent were between 1 and 2 feet. Eya (1976) reported holes from 0.3 to 10 feet from the ground. Halstead (1990)

reported finding at least one exit hole as high as 25 feet above the ground, but also reported that exit hole occurrences are most common between ground level and four feet. A more recent study by Collinge *et al.* (2001) found exit holes from ground level to approximately six feet above ground.

Field work along the Cosumnes River and in the Folsom Lake area indicates that larval galleries can be found in elderberry stems with no evidence of exit holes; the larvae either die prior to construction of an exit hole or are not far enough along in the developmental process to construct an exit hole. The VELB Recovery Plan (Service 1984) and Barr (1991) contain further details on the VELB's life history.

Status, Distribution and Population Dynamics

When the VELB was federally listed as threatened on August 8, 1980 (45 **FR** 52803: Service 1980), the species was known to occur at less than 10 localities along the American River, the Merced River, and Putah Creek. By the time the VELB Recovery Plan was prepared in 1984, additional species localities had been found along the American River and Putah Creek. As of 1998, the California Natural Diversity Database included 181 occurrences for this species in 44 drainages throughout the Central Valley, from a location along the Sacramento River in Shasta County, southward to an area along Caliente Creek in Kern County (CNDDB 1998). In the foothills of the western Sierra Nevada, adults have been found up to 2,220 feet in elevation, and exit holes up to 2,940 feet in elevation. Although the VELB has been discovered in many localities where it had not been known to occur when the species was federally listed, recent studies indicate that the VELB continues to be threatened by habitat loss and fragmentation, including loss or degradation of the riparian forest ecosystem as a result of agricultural and urban development (Barbour et al 1993; Eng 1984; Kucera and Barrett 1995; Katibah 1984).

Colonization by the Argentine ant (*Linepithema humile*) may also pose a biological threat to VELB through egg predation (Huxel 2000). Other factors such as pesticide drift, exotic plant invasion, and grazing may possibly affect VELB or its habitat. The VELB is a rare habitat specialist that inhabits a highly fragmented landscape. Based on historical evidence regarding riparian habitat in the Central Valley prior to colonization, the VELB probably evolved as a species in the context of continuous wide stretches of riparian habitat. The substantial loss of riparian habitat in the Central Valley since the large human population influx in the mid 19th century may have driven VELB populations to low numbers long before the species was listed in 1980. This habitat loss resulted not only in a decline in VELB numbers, but also in increased habitat fragmentation. Recent studies have indicated that the VELB is highly vulnerable to habitat fragmentation, largely due to the species' limited dispersal abilities (Collinge *et al.* 2001).

Environmental Baseline

Status of the Species Within the Action Area

Continued human population growth in the Central Valley is expected to drive further development of agriculture, cities, industry, transportation, and water resources in the foreseeable

future. This future development, and the associated infrastructure, will further contribute to the continued loss and fragmentation of natural areas, including areas harboring the VELB. With the historic and ongoing loss and fragmentation of this species' habitat, and the likely ongoing effects of anthropogenic factors such as pesticides, invasion of exotic plant species, and spread of the Argentine ant, VELB perseverance will be difficult without well designed and successfully implemented conservation efforts. Moreover, VELB persistence over the next 100 years is unlikely without reversing habitat loss through habitat restoration (Collinge, *et al.* 2001, Huxel and Collinge, in prep.). VELB conservation efforts to date have probably resulted in a net increase in habitat, considering authorized loss only (unauthorized loss cannot be quantified), but the degree of increase is unknown because conservation efforts have not been closely monitored for success. To provide for the long-term persistence of this species, loss of occupied habitat must be limited, and any loss must be addressed by providing additional habitat that is likely to have long-term conservation value for the species. However, habitat restoration may not enhance long-term persistence unless conservation areas (transplant/planting sites) are placed in close proximity to sites where the VELB occurs naturally (Collinge *et al.* 1991; Huxel and Collinge, in prep.). Collinge *et al.* (2001) showed that dispersal among drainages was relatively rare, thus the placement of conservation planting sites within the dispersal range of the VELB is crucial. Prudent choice of conservation areas coupled with limited loss of occupied and potential VELB habitat will ensure the long-term viability of this species.

Factors Affecting Species Environment Within the Action Area

The following discussion analyzes the effects of past and ongoing factors leading to the current status of the species, its habitat and ecosystem, throughout the species' range. It includes an analysis of effects from projects that have received incidental take authorization for the VELB since the species was listed and, based on the best available information, an evaluation of conservation efforts aimed at minimizing these effects. The purpose of this analysis is to provide a baseline with which to compare in determining whether implementation of the proposed project would jeopardize the continued existence of the species, and whether the proposed project would provide for the species' conservation and long-term survivability.

Habitat Loss

Habitat loss has been ranked as the single greatest threat to biodiversity in the United States (Wilcove *et al.* 1998). In the 1980 final rule to list the VELB as threatened, habitat destruction was cited as the primary factor contributing to the need to federally list the species. As stated in the final rule, by the time the species was listed, its habitat had largely disappeared throughout much of its former range due to agricultural conversion, levee construction, and stream channelization. The 1984 Recovery Plan reiterated that the primary threat to the VELB was loss and alteration of habitat by agricultural conversion, grazing, levee construction, stream and river channelization, removal of riparian vegetation, riprapping of shoreline, plus recreational, industrial and urban development (Service 1984). Riparian forests, the primary VELB habitat, have been severely depleted throughout the Central Valley over the last two centuries as a result of expansive agricultural and urban development (Katibah 1984, Thompson 1961, Roberts *et al.* 1977). Since colonization, these forests have been "modified with a rapidity and completeness

matched in few parts of the United States" (Thompson 1961). As of 1849, the rivers and larger streams of the Central Valley were largely undisturbed. They supported continuous bands of riparian woodland 4 to 5 miles in width along some major drainages such as the lower Sacramento River, and generally about 2 miles wide along the lesser streams (Thompson 1961). Most of the riverine floodplains supported riparian vegetation to about the 100-year flood line (Katibah 1984).

Some accounts state that the Sacramento Valley, as of approximately 1848, supported approximately 775,000 to 800,000 acres of riparian forest (Smith 1977, Katibah 1984). No comparable estimates are available for the San Joaquin Valley. Based on early soil maps, however, more than 921,000 acres of riparian habitat are believed to have been present throughout the Central Valley under pre-settlement conditions (Katibah 1984). Another source estimates that out of approximately five million acres of wetlands in the Central Valley in the 1850's, approximately 1,600,000 acres were riparian wetlands (Frayer *et al.* 1989). A large human population influx occurred after 1849, however, and much of the Central Valley riparian habitat was rapidly converted to agriculture and used as a source of wood for fuel and construction to serve a wide area (Thompson 1961). By as early as 1868, riparian woodland had been severely affected in the Central Valley, as evidenced by the following excerpt:

> This fine growth of timber which once graced our river [Sacramento], tempered the atmosphere, and gave protection to the adjoining plains from the sweeping winds, has entirely disappeared-the woodchopper's axe has stripped the river farms of nearly all the hard wood timber, and the owners are now obliged to rely upon the growth of willows for firewood (Cronise 1868, in Thompson 1961).

The clearing of riparian forests for fuel and construction made this land available for agriculture (Thompson 1977). Natural levees bordering the rivers, once supporting vast tracts of riparian habitat, became prime agricultural land (Thompson 1961, 1977). As agriculture expanded in the Central Valley, needs for increased water supply and flood protection spurred water development and reclamation projects. Artificial levees, river channelization, dam building, water diversion, and heavy groundwater pumping further reduced riparian habitat to small, isolated fragments (Katibah 1984). In recent decades, these riparian areas have continued to decline as a result of ongoing agricultural conversion, development, and stream channelization. As of 1989, there were over 100 dams within the Central Valley drainage basin, as well as thousands of miles of water delivery canals and streambank flood control projects for irrigation, municipal and industrial water supplies, hydroelectric power, flood control, navigation, and recreation (Frayer *et al.* 1989). Riparian forests in the Central Valley have dwindled to discontinuous strips of widths currently measurable in yards rather than miles. Based on a California Department of Fish & Game (CDFG) riparian vegetation distribution map, by 1979 there were approximately 102,000 acres of riparian vegetation remaining in the Central Valley. This represents a decline in acreage of approximately 89 percent as of 1979 (Katibah 1984). More extreme figures were given by Frayer *et al.* (1989), who reported that woody riparian forests in the Central Valley had declined to 34,600 acres by the mid-1980s (from 65,400 acres in 1939). Although these studies have differing findings in terms of the number of acres lost (most likely explained by differing methodologies), they attest to a dramatic historic loss of riparian habitat in the Central Valley.

As there is no reason to believe that riparian habitat suitable to the VELB (occupied by elderberry shrubs) would be destroyed at a different rate than other riparian habitat, it can be assumed that the rate of loss for VELB habitat in riparian areas has been equally dramatic. A number of studies have focused on riparian loss along the Sacramento River, which supports some of the densest known VELB populations. Approximately 98 percent of the middle Sacramento River's historic riparian vegetation was believed to have been extirpated by 1977 (CDWR 1979). The California Department of Water Resources estimated that native riparian habitat along the Sacramento River from Redding to Colusa decreased from 27,720 acres to 18,360 acres (34 percent) between 1952 and 1972 (Conrad *et al.* 1977). The average rate of riparian loss on the middle Sacramento River was 430 acres per year from 1952 to 1972, and 410 acres per year from 1972 to 1977. In 1987, riparian areas as large as 180 acres were observed converted to orchards along this river (McCarten and Patterson 1987). Barr (1991) examined 79 sites in the Central Valley supporting VELB habitat. When 65 of these sites were re-examined in 1997 (Collinge *et al.* 2001), seven no longer supported VELB habitat. This represents a decrease in the number of sites with VELB habitat by approximately nine percent in six years.

There is no comparable information on the historic loss of non-riparian VELB habitat such as elderberry savanna and other vegetation communities where elderberry occurs (oak or mixed chaparral-woodland, or grasslands adjacent to riparian habitat). However, all natural habitats throughout the Central Valley have been heavily affected within the last 200 years (Thompson 1961), and it can be assumed that non-riparian VELB habitat also has suffered a widespread decline. This analysis focuses on loss of riparian habitat because the VELB is primarily dependent upon riparian habitat. Adjacent upland areas are also likely to be important for the species, but this upland habitat typically consists of oak woodland or elderberry savanna bordering willow riparian habitat (Barr 1991). The riparian acreage figures provided by Frayer *et al.* (1989) and Katibah (1984) included the oak woodlands concentrated along major drainages in the Central Valley, and most likely included lands we would classify as upland VELB habitat adjacent to riparian drainages. Between 1980 and 1995, the human population in the Central Valley grew by 50 percent, while the rest of California grew by 37 percent. The Central Valley's population was 4.7 million by 1999, and it is expected to more than double by 2040. The American Farmland Trust estimates that by 2040 more than 1 million cultivated acres will be lost due to development and 2.5 million more put at risk (Ritter 2000). This increasing population in the Central Valley and resultant development pressure is likely to result in continuing loss of riparian habitat.

While habitat loss is clearly a large factor leading to the species' decline, other factors are likely to pose significant threats to the long-term survival of the VELB. Approximately 20 percent of riparian sites with elderberry observed by Barr (1991) supported VELB populations, based on observance of exit holes. Collinge *et al.* (2001) observed both historic and recent exit hole data and found 24.3% occupancy rates. Jones and Stokes (1988) found evidence of VELB populations on 65 percent of 4,800 riparian acres along the Sacramento River. The fact that a large percentage of apparently suitable habitat is unoccupied suggests that the populations are limited by factors other than habitat availability, such as habitat quality or limited dispersal ability.

Habitat Fragmentation

Destruction of riparian habitat in central California has resulted not only in loss of acreage, but also in habitat fragmentation. Riparian habitat in the Central Valley, which has experienced greater than 90 percent loss by most estimates, would meet this criterion as habitat vulnerable to effects of fragmentation. Existing data suggests that VELB populations are affected by habitat fragmentation. Barr (1991) found that small, isolated habitat remnants were less likely to be occupied by the VELB than larger patches, indicating that VELB subpopulations are extirpated from small habitat fragments. Barr (1991) and Collinge *et al.* (2001) consistently found VELB exit holes occurring in clumps of elderberry bushes rather than isolated bushes, suggesting that isolated shrubs do not typically provide long-term viable habitat for this species.

Local populations of organisms often undergo periodic colonization and extinction, while the metapopulation (set of spatially separated groups of a species) may persist (Collinge 1996). Habitat fragmentation can be an important factor contributing to species declines because: (1) it may divide a large population into two or more small populations that become more vulnerable to inbreeding depression, genetic drift, and other problems associated with small populations; (2) it may limit a species' potential for dispersal and colonization; and (3) it makes habitat more vulnerable to outside influences by increasing the edge : interior ratio (Primack 1998). These factors, as they relate to the VELB, are discussed below.

Small Populations

Small, isolated subpopulations are susceptible to extirpation from random demographic, environmental, and/or genetic events (Shaffer 1981, Lande 1988, Primack 1998). While a large area may support a single large population, the smaller subpopulations that result from habitat fragmentation may not be large enough to persist over a long time period. As a population becomes smaller, it tends to lose genetic variability through genetic drift, leading to inbreeding depression and a lack of adaptive flexibility. Smaller populations also become more vulnerable to random fluctuations in reproductive and mortality rates, and are more likely to be extirpated by random environmental factors.

Species that characteristically have small population sizes, such as large predators or habitat specialists, are more likely to become extinct than species that typically have large populations (Primack 1998). Also, a species with low population density (few individuals per unit area) tends to have only small populations remaining if its habitat is fragmented. Populations of species that naturally occur at lower densities become extinct more rapidly than populations of species with higher densities (Bolger *et al.* 1991). The species may be unable to persist within each fragment, and gradually die out across the landscape.

The VELB, a specialist on elderberry plants, tends to have small population sizes, and occurs in low densities (Barr 1991, Collinge *et al.* 2001). Collinge *et al.* (2001) compared resource use and density of exit holes between the VELB and a related subspecies, the California elderberry longhorn beetle (CELB). The VELB tended to occur in areas with higher elderberry densities and lower exit hole densities than CELB. With extensive riparian habitat loss and fragmentation,

these naturally small populations are broken into even smaller, isolated populations. Once a small population has been extirpated from an isolated habitat patch, the species may be unable to re-colonize this patch if it is unable to disperse from nearby occupied habitat.

Limited dispersal and colonization

Insects with poor dispersal abilities may persist better in large habitat patches than small patches because small fragments may be insufficient to maintain viable populations when insects are unable to disperse to more suitable habitat (Collinge 1996).

Studies suggest that the VELB may be unable to re-colonize drainages where the species has been extirpated, due to its limited dispersal ability (Huxel 2000, Barr 1991; Collinge *et al.* 2001). Huxel and Collinge (in prep.) used computer simulations of colonization and extinction patterns for the VELB based on differing dispersal distances, and found that the short dispersal simulations best matched the 1997 census data in terms of site occupancy. This suggests that in the natural system, dispersal and thus colonization is limited to nearby sites. At spatial scales greater than 10 kilometers (km), such as across drainages, VELB occupancy appears to be strongly influenced by regional extinction and colonization processes, and colonization is constrained by limited dispersal (Collinge *et al.* 2001). Except for one occasion, drainages examined by Barr occupied in 1991 remained occupied in 1997 (Collinge *et al.* 2001). The one exception was Stony Creek, which was occupied in 1991 but not in 1997. All drainages Barr (1991) found to be unoccupied in 1991 were also unoccupied in 1997. These data suggest that unoccupied drainages are not easily recolonized by the VELB.

Edge Effects

Habitat fragmentation not only isolates small populations, but also increases the interface between habitat and urban or agricultural land, increasing negative edge effects such as the invasion of non-native species (Huxel 2000, Soule 1990) and pesticide contamination (Barr 1991).

Argentine Ants

Recent evidence indicates that the Argentine ant may pose a risk to the long-term survival of the VELB (Huxel 2000). The Argentine ant has negatively affected populations of other native arthropod species (Ward 1987). Predation on eggs is most likely the effect these ants have on the VELB. In Portugal, Argentine ants have been found to be significant egg predators on the eucalyptus borer (*Phoracantha semipunctata*)(Way *et al.* 1992). Egg predation on the VELB could lead to local extirpations, as indicated by a population viability study, suggesting that egg and juvenile mortality are significant factors affecting probability of extinction for the VELB (Huxel and Collinge, in prep.). The Argentine ant has been expanding its range throughout California since its introduction around 1907, especially in riparian woodlands associated with perennial streams (Ward 1987). Huxel (2000) states that, given the potential for Argentine ants to spread with the aid of human activities such as movement of plant nursery stock and

agricultural products, this species may eventually infest most drainages in the Central Valley along the valley floor, where the VELB is found.

Pesticides

Direct spraying or drift of herbicide or insecticide in or near riparian areas (which may be done to control mosquitoes, crop diseases, or other pests) is likely to adversely affect the VELB and its habitat. Elderberries commonly grow along drainage and irrigation ditches and, therefore, are subject to over-spray and pesticide drift, which could effect the beetle. Malathion effects have been found to depress coleopteran populations by as much as 87.9 percent for up to one year after spraying (Quinn *et al.* 1990). As of 1980, the prevalent land use adjacent to riparian habitat in the Sacramento Valley was agriculture, even in regions where agriculture was not generally the most common land use (Katibah *et al.* 1984). Therefore, the species is likely susceptible to pesticide contamination from adjacent agricultural practices. Recent studies of major rivers and streams documented that 96 percent of all fish, 100 percent of all surface water samples and 33 percent of major aquifers contained one or more pesticides at detectable levels (Gilliom 1999). Pesticides were identified as one of the 15 leading causes of impairment for streams included on the Clean Water Act section 303(d) lists of impaired waters. As the VELB occurs primarily in riparian habitat, the contamination of rivers and streams may affect this species and its habitat. Pesticides have been identified as one of a number of potential causes of the decline of pollinator species and other insects beneficial to agriculture (Ingram *et al.* 1996), therefore it is possible that the VELB, typically occurring adjacent to agricultural lands, has suffered a decline due to pesticides.

Other Factors

Competition from invasive exotic plants such as giant reed (*Arundo donax*) may adversely affect riparian habitat supporting the VELB. Giant reed, a native of Asia, has become a serious problem in California riparian habitats, forming dense, homogenous stands essentially devoid of wildlife and native plants. This species, growing up to 2.5 inches per day and yielding 8.3 tons of oven-dry cane per acre, tolerates drought, floods, and extreme temperatures, and is not significantly affected by insects, disease, herbivory, fire, or mechanical disturbance. It has an extensive root system allowing it to resprout rapidly after disturbance and out-compete native riparian vegetation. Giant reed also introduces a frequent fire cycle into the riparian ecosystem, disrupting natural riparian dynamics and eventually forming homogenous climax communities. The extent to which giant reed has affected elderberry specifically, however, has not been studied. Effects of other non-native, invasive plants such as black locust (*Robinia pseudoacacia*), tamarisk (*Tamarix* spp.), and Himalayan blackberry (*Rubus discolor*), on habitat of the VELB are also little studied.

Grazing by livestock may damage or destroy elderberry plants and inhibit regeneration of seedlings. Cattle readily forage on new growth of elderberry, which may explain the apparent absence of VELB at manicured elderberry stands (Service 1984). Habitat fragmentation exacerbates problems related to exotic species invasion and cattle grazing by increasing the edge-to-interior ratio of habitat patches, facilitating the penetration of these influences.

Illegal damage to elderberries is also believed to have a sizeable, but unknown, effect upon the VELB. Various public and private entities are known to periodically trim elderberry shrubs for road maintenance, pole line repair, road construction and brush clearing purposes. Additional losses occur through the removal of shrubs during residential construction or alterations. Since few of these activities are reported or permitted, quantification of such effects is not possible.

Projects Authorized for Incidental Take, and Associated Conservation Efforts

As of July, 2000, the date of the last comprehensive investigation of consultations on projects affecting VELB and its habitat, the Service had processed at least 172 section 7 consultations authorizing take of the VELB since the species was federally listed in 1980. Projects typically affected under ten shrubs (59 of 81 projects sampled, or 73 percent), and sometimes affected over 50 shrubs (8 of 81 projects sampled, or 10 percent). The greatest number of shrubs affected by a single project was 282. These 172 projects affected an estimated 3,784 elderberry shrubs, and 17,372 elderberry stems greater than 1 inch in diameter. Based on an estimated 1,800 square feet for every five shrubs (consistent with the 1996 and 1999 Guidelines), roughly 31 acres of an ecosystem supporting VELB habitat were lost with the removal of 3,784 elderberry shrubs.

As of July 2000, the Service had processed 6 section 10 (A)(1)(a) permits authorizing take of the VELB since the species was federally listed in 1980. No projects affected more than 15 shrubs. These six projects affected an estimated 50 elderberry shrubs. Based on an estimated 1,800 square feet for every five shrubs (consistent with the 1996 and 1999 Guidelines), roughly 0.4 acre of riparian habitat were lost with the removal of 50 elderberry shrubs.

Based on the Service's VELB Conservation Guidelines that were in effect from 1996 to 2000 (when 95 percent of the consultations occurred), roughly 36,000 seedlings with associated native plants were to be planted to address the losses of elderberry shrubs that were authorized for take under these consultations. Based on a minimum 60 percent survival rate, as required under Service Guidelines, 21,847 of the elderberry seedlings would have survived. With 0.57 acre of riparian habitat per five seedlings planted, as required under the Service Guidelines, roughly 4,104 acres of riparian habitat were to have been planted to compensate for losses authorized under the Service's consultations to date. Because of a shortage of staff and funding, however, the Service has been unable to monitor the success of VELB conservation measures implemented through these projects. It is also not known what proportion of these sites are within the 12.4 mile (20 kilometer) VELB dispersal distance from known occupied sites that was noted by Collinge *et al.* (2001), though it is expected that conservation sites adjacent to relatively densely-occupied regions (*i.e.* the lower reaches of the Sacramento and American rivers) would have a higher likelihood of success as VELB habitat than would remote sites not adjacent to vegetated stream courses.

In the nearly 3 years that have passed since the detailed baseline data were compiled, the Service has issued approximately 30 biological opinions allowing limited amounts of take. These biological opinions utilized the 1999 Conservation Guidelines, either as appendages to September 19, 1996, and March 11, 1997, programmatic biological opinions (Service files 1-1-96-F-0066 and 1-1-96-F-0156, respectively) or as stand-alone biological opinions authorizing

larger amounts of take, such as the January 9, 2001, and March 29, 2001, biological opinion on and amendment of the Quarry Ridge project in Sacramento County, California (Service files 1-1-00-F-0075 and 1-1-01-F-0078, respectively). The latter biological opinion and its amendment authorized the incidental take of all VELB inhabiting three guideline-driven stem size classes with 32 elderberry shrubs.

The Service has also increasingly relied upon alternate, non-1999 Conservation Guideline-driven conservation strategies where those strategies are believed to be adequate to protect the VELB. For example, on July 23, 2002, the Service issued to the Federal Highway Administration (Administration) an amended biological opinion (Service file 1-1-02-F-0222 amending 1-1-01-F-0077) on the effects of a comprehensive bike-trail improvement and maintenance program on the lower American River in Sacramento County which involved a large-scale, non-native weed renovation program. In the bike trail biological opinion, the incidental take of 30 shrubs (10 shrubs per year for each of three years) and up to 300 stems greater than 1" in diameter at ground level for initial project implementation was authorized. To offset this take, the County of Sacramento (on behalf of the Administration) would implement a two acre elderberry conservation site and begin renovation of approximately 650 acres of invasive, non-native plants, followed by restoration with native species.

Other projects seek to preserve on or near the project site occupied elderberries, to help address dispersal concerns raised by Collinge *et al.* (2001). The Service is currently engaged in formal consultation with the Administration regarding preservation and/or transplantation of elderberries on sites known to be occupied, rather than relying solely on off-site conservation at a bank.

Huxel and Collinge (in prep.) recently used a modeling approach to examine the effects of various demographic parameters and management strategies on long-term survivability of the VELB. They found that habitat restoration may not enhance long-term survivability of the species unless mitigation sites are placed in close proximity to sites where the VELB occurs naturally. Since dispersal among drainages is relatively rare, VELB compensation sites must be placed within the dispersal range of the species if they are to provide long-term conservation benefits. The spatial dependence of site colonization also suggests caution in allowing further destruction of occupied VELB sites. Collinge *et al.* (2001) stress that placement of compensation sites should consider the proportion of occupied sites within a 12.4 mile (20 kilometer) distance.

As stated by Collinge *et al.* (2001), restoration projects for the VELB have usually not considered the important demographic contributions of other restoration sites and nearby native habitats. Future compensation plans need to consider not only what constitutes usable habitat for a species, but also the details of metapopulation viability and patch occupancy. Based on existing information regarding the projects that have been authorized under the Act for take of the VELB, and the conservation measures implemented to minimize effects on the species, there has likely been a net increase in riparian habitat acreage and numbers of elderberry shrubs as a result of these projects. The degree to which this increase has benefitted the species, however, is uncertain. Furthermore, it is likely that unauthorized destruction of VELB habitat has occurred, although the Service has not been able to quantify such destruction.

Baseline and Baseline Assumptions at the Project Site

The construction of the Pacific Gas and Electric Company transmission facilities included an initial period of relatively intense disturbance, which included major ground disturbance for clearing of corridors, construction of towers, and clearing and construction of access roads. These activities removed habitat and fragmented the remaining habitat to varying degrees. It is difficult to determine to what degree any of the known populations of VELB were affected by the original construction or past maintenance activities.

Information on the location of elderberry plants on National Forest System lands was gathered in 1998 from field surveys prepared by Pacific Gas and Electric Company (1998a, 1998b, and 1998c) in response to two separate FERC Additional Information Requests (AIR's) for the Rock Creek-Cresta, Mokelumne River and Haas-Kings River hydroelectric relicensing project. Additional data on VELB habitat occurrence on Forest Service lands was collected during road surveys (identifying project roads) when incidental observations of occurrence of elderberry plants were recorded and reported to the Service in the wildlife BA. A database search [FS, Pacific Gas and Electric Company and California Natural Diversity Data Base (CNDDB)] for elderberry sites on Forest Service lands revealed 18 known sites within the Plumas National Forest, 42 known sites within the Sierra National Forest and 8 known sites within the Sequoia National Forest. The two surveys completed in 1998 on National Forest System lands resulted in 10 elderberry plants or clumps greater than one inch diameter, four with exit holes, located in Plumas National Forest, 24 plants or clumps greater than one inch diameter, three with exit holes, located in the Sierra National Forest and five plants or clumps greater than one inch diameter, one with an exit hole, located in the Sequoia National Forest. No elderberries were located in Shasta-Trinity, Tahoe, Eldorado or Stanislaus National Forests. In response to an October 3, 2000, request for additional information from the Service, additional elderberry plant surveys were completed during fall of 2000 and the data were presented in an Addendum to the biological assessment. The 2000 VELB surveys on Forest Service lands were conducted as part of special status plant surveys, but no detailed measurements of the plants, observations of VELB exit holes, nor associated habitats were made. Only number of plants and anticipated effects were recorded from each location. The number of elderberry plants reported in the Addendum after the 1998 data gathering and 2000 surveys were 21 elderberry plants in the Plumas National Forest, 86 plants in the Sierra National Forest and ten plants in the Sequoia National Forest for a total of 117 plants. All plants are reportedly within 100 feet of the transmission line corridors. The general locations are along the Caribou-Big Bend transmission corridor in Plumas National Forest, the Wishon-San Joaquin and Haas-McCall transmission corridors in Sierra National Forest and the Haas-McCall and Tule-Springville transmission corridors in the Sequoia National Forest. Pacific Gas and Electric Company did not provide the Service with the exact locations of these plants. Evidence of past beetle occupancy was reported at <4 percent (1 out of 23 plants where exit hole determinations were made). Occupancy was not determined for the remaining 88 plants. (Pacific Gas and Electric Company 1998b, 1998c, Garcia and Associates 2000, Pacific Gas and Electric Company 1999).

Surveys were conducted on BLM administered lands (Garcia and Associates 2003a and 2003b) in 2002 and 2003 that identified 37 elderberry shrubs within the Transmission Separation Project

in three separate areas – Kerckhoff (FERC #96), Spring Gap-Stanislaus (FERC #2130), and Mokelumne River (FERC #137). Based on exit hole observations, historic VELB occupancy of the shrubs surveyed was reported to average73 percent (Table 3).

In Fall 2000, the Pacific Gas and Electric Company began to survey for and identify the locations of elderberry plants that occur within its electric transmission and distribution rights-of-way, licenses and franchises and began developing a comprehensive database of known elderberry plant locations. Elderberry within 20 feet of other vegetation requiring trimming has been documented by address, while elderberry that requires trimming has been surveyed in greater detail (e.g., VELB habitat quality, presence of exit holes, and plant community characteristics). Data have been collected from the following Pacific Gas and Electric Company divisions responsible for vegetation management: North Valley, Sacramento, Sierra, Stockton, Diablo, Yosemite, and Fresno. A limited sampling (10 percent) of known elderberry was surveyed for global position, beetle occupancy, height, canopy width, and general habitat quality.

The number of elderberry plants identified in surveys conducted for the aforementioned projects is shown in Table 5. The average VELB occupancy rate (per shrub, as evidenced by presence of exit holes) in a 2001 O&M systemwide vegetation management study was approximately 22 percent. For all surveys where elderberry shrubs and VELB exit holes were recorded, occupancy averages 28.7 percent. Although surveys were directed toward Pacific Gas and Electric Company land and/or facilities, this value is comparable to the 27.8 percent occupancy (64 out of 230 sites surveyed) reported by Barr (1991). The Pacific Gas and Electric Company is using data from these various projects and activities to develop a database of known elderberry locations along its facilities.

Table 5. Elderberry/VELB Surveys along Pacific Gas and Electric Company Facilities.

Project Type/Name/Description	Survey Period	Survey Area	Plant Nos.	Occupancy	No. Plants Potentially Affected
Transmission Separation Project - FS					
Plumas National Forest	1998-2000	31 miles T/L; 401 acres	21	indeterminable	2
Sierra National Forest	1998-2000	23 miles T/L; 193 acres	86	4% (23 plant sample)	12
Sequoia National Forest	1998-2000	4.6 miles T/L; 52 acres	10	indeterminable	4
Shasta-Trinity National Forest	2000	23.1 acres	0	n/a	0
Tahoe National Forest	2000	No lands below 3,000 feet	0	n/a	0
Eldorado National Forest	2000	11.7 acres	0	n/a	0
Stanislaus National Forest	2000	No lands below 3,000 feet	0	n/a	0
Transmission Separation Project - BLM (FERC non-jurisdictional)					
Kerckhoff 1 and 2 (FERC No. 96)	2002	2.6 miles T/L; 15.9 acres	10	40%	8
Mokelumne (FERC No. 137)	2002	4.5 miles T/L; 59.7 acres	6	83%	3
De Sabla-Centerville (FERC No. 1121)	2002	0.9 miles T/L; 17.9 acres	0	n/a	0

Battle Creek (FERC No. 1121)	2002	11.3 miles T/L; 40.7 acres	11	73%	11
Crane Valley (FERC No. 1354)	2002	0.1 mile T/L; 5.0 acres	0	n/a	0
Spring Gap-Stanislaus (FERC No. 2130)	2002	1.7 miles T/L; 21.8 acres	10	100%	5
Drum-Spaulding (FERC No. 2310)	2002	9.5 miles T/L; 42.2 acres	0	n/a	0
Rock Creek-Cresta (FERC No. 1962)	2002	1.2 miles T/L; 11.1 acres	0	n/a	0
Haas-Kings River (FERC No. 1988)	2002	0.5 mile T/L; 2.3 acres	0	n/a	0
Various Hydro Projects with VELB (Within FERC Boundaries, non-FS, non-BLM)					
Rock Creek-Cresta	1998	73 miles T/L ROW, roads, 775 acres	85	27%	9
Haas-Kings River	1998	40 miles T/L ROW, roads, 1,000 acres	81	20%	7
Mokelumne River Project	1997	45 miles T/L ROW, roads, 1,200 acres	78	40%	6
Ongoing Operation and Maintenance					
Electric Distribution and Transmission Vegetation Management	2001	~55,000 miles transmission and distribution	1,110-6,500 (Est.)	22%*	151
Electric Distribution and Transmission Vegetation Management	2002	~55,000 miles transmission and distribution	1,110-6,500 (Est.)	n/a	172
Previously-Permitted Major Construction Projects					
Gasline 401 Expansion Project	1992	840 miles	1,203	n/a	427
Oakhurst 115kV Pole Replacement	1997	12 miles T/L ROW, 75-foot corridor	56	20%	10

*Systemwide, VELB occupancy was estimated by sampling 10% of documented elderberry shrubs throughout the species' range.

Effects of the Proposed Action

While the localized effects of the proposed action to continue occupancy, use and maintenance of existing transmission facilities will contribute to the local and range-wide trend of habitat loss, fragmentation, and degradation through trimming and potential removal of elderberry bushes, the effects of the proposed action taken together with the protective conservation measures described in the proposed action (see project description), is intended to minimize and compensate for these localized adverse effects.

Additionally, implementation of the proposed action, including the VELB conservation program, is intended to make appreciable contributions to the protection and recovery of the beetle.

Factors to Be Considered

The proposed action extends throughout the range of the VELB where Pacific Gas and Electric Company facilities may be located. Although the proposed action has the potential to affect elderberry over a wide geographic range, the large majority of potential effects are considered

short-term and variable depending upon site-specific needs. Additionally, with the limited exception of small numbers of elderberry that would need to be removed, it is likely that significant portions of Pacific Gas and Electric Company activity will be focused on those portions of elderberry shrubs that may be higher than typically observed exit holes. Likewise, Service staff have observed survival and regrowth of previously-trimmed elderberry bushes.

Analyses for Effects of the Action

The proposed action will have both direct and indirect effects on the VELB. Removing or trimming elderberry shrubs may be a direct effect on the VELB and constitutes take of the VELB via the harassment and mortality of adults, eggs, and larvae, and harm via modification and degradation of habitat. Direct effects include disturbance of habitat (elderberry) associated with operation and maintenance activity of electric transmission lines, electric distribution lines, access roads, gas lines, and linear generation facilities. Although the Pacific Gas and Electric Company operates approximately 5,000 circuit miles of underground distribution lines within potential range of the VELB, most effects on elderberry plants will occur through vegetation management activity around overhead electric transmission and distribution lines. Beetles could be killed during trimming/pruning of elderberry stems during routine vegetation management activity (as adults, post-emergence, or as larvae if stems being removed are >1" at or near the level of the cut).

Additionally, the potential effects on the VELB include the removal of habitat during, among other things, regular vegetation management, anchor/guy or incidental pole replacement, road maintenance, or emergency activities. The proposed project also includes the use of herbicides (but not on Forest Service lands), which may affect VELB and its habitat.

System wide vegetation management activity in 2001 and 2002 occurred across approximately 55,500 miles of electric transmission and distribution lines within the potential habitat range of the VELB. Although no removals occurred, elderberry plants were trimmed or pruned to maintain the regulatory conductor clearance requirements. No VELB, dead or alive, were reported or identified during these activities, though searches were likely not thorough and could not assess latent mortality. From a limited survey (a sub-sample of all sites reported in 2001), evidence of previous beetle occupation occurred in 22 percent of the elderberry shrubs.

The biological assessment for the Forest Service lands addresses effects on the VELB and its habitat within the transmission line corridors and along roads and shoulders of roads on Forest Service lands where 117 elderberry shrubs are reported to occur within 100 feet of potential routine operation and maintenance work on Pacific Gas and Electric Company facilities. The number of elderberry plants with the potential to be directly affected (trimmed, cut or removed) by the Project on FS Forest Service lands associated with the Transmission Separation Project are two in the Plumas National Forest, twelve in the Sierra National Forest and four in the Sequoia National Forest for a total of eighteen plants (Table 5). The biological assessment addendum prepared for FS lands (Foster Wheeler 2000a; 2001) indicates that the number of elderberry plants on FS lands associated with the Transmission Separation Project that may be indirectly affected from potential disturbance near the plant due to routine maintenance and

operation activities was conservatively estimated to be 58. However, implementation of reasonable and prudent measures contained in this biological opinion and incidental take statement will significantly minimize the potential for effect on these elderberry plants. The remaining 29 (of the 117) elderberry plants will be subject to routine maintenance activities within 100 feet of the plants, but are also not anticipated to be affected.

Surveys on BLM land identified a total of 37elderberry shrubs in four of the nine projects surveyed. Approximately 27shrubs on BLM lands could potentially be affected, either directly or indirectly, by the Pacific Gas and Electric Company's routine maintenance and operations activity (Table 5). The effect would be counted at the time of the activity and would be defined as the first time of trimming or, if absolutely necessary, when the plant is removed. These effects would be related to or result from the routine operation and maintenance activities described for that project.

Based on previous information provided to the Service (e.g., electronic mail notifications), routine vegetation management activity within electric transmission and distribution rights-of-way directly affected as many as 151 elderberry plants in 2001 (the first full year of program-level tracking). According to internal Pacific Gas and Electric Company records, as many as 172 plants were trimmed in 2002 as a part of routine electric system maintenance and regulatory compliance. Effects are also anticipated for 22 plants associated with the Mokelumne River, Haas-Kings River, and Rock Creek-Cresta (FERC) projects, although these portions of the facilities are not located within FS or BLM administered lands.

Additionally, elderberry counts are expected to increase where mature plants are located, due to seed dispersal/natural propagation from those mature shrubs. Thus, it is anticipated that trimming of new or previously untrimmed elderberry plants will be required over time, particularly beneath electric lines. A limited ground survey of reported elderberry locations in 2001 showed that approximately 35 percent of plants had been trimmed previously, and potentially repeatedly, during Pacific Gas and Electric Company and non-Company activities (by other agencies or individuals). Based upon the numbers of elderberry located adjacent to Company facilities, including those that are part of hydroelectric projects, and routine maintenance needs, as well as potential increases in elderberry beneath PG&E facilities, it is anticipated that up to 250 plants per year may need to be trimmed or otherwise affected. Additionally, it is anticipated that a relatively small number of plants (20 per year) would need to be removed in their entirety (versus trimming/pruning) due, for example, to their locations within facility access roads.

Finally, potential indirect effects on the VELB resulting from activities associated with the proposed project may also result in the form of fragmentation of habitat where elderberry shrubs and associated vegetation is removed. Removal of associated vegetation (trees/shrubs) can alter the habitat structure and microclimate of the surrounding environment. Changes in habitat structure (vertical and horizontal distribution of plant life) and microclimate (such as solar radiation, temperature, relative humidity, soil moisture) could negatively affect the behavior of VELB in response to these changes in unforeseen ways. Other direct and indirect effects involve damage to the shrub from vehicle use and road and transmission line maintenance. Although

difficult to measure, indirect effects on larvae or beetles may result from effects on (pruning of) individual elderberry plants. Researchers at University of California, Davis are currently conducting a multi-year elderberry management study to help determine the influence of trimming/cutting plants on beetle biology/ecology.

Beneficial Effects

As discussed previously in the Description of the Proposed Avoidance, Minimization, and Conservation Measures, the Proposed Action includes a significant region-wide conservation program for the VELB, which is discussed in more detail below.

Species Response to the Proposed Action

The Service has determined that the anticipated level of effect on VELB resulting of Pacific Gas and Electric Company routine operation and maintenance activities is expected to be offset by implementation of the Company's VELB conservation program, particularly the acquisition of 1,000 acres of elderberry habitat. VELB habitat acquired under the conservation plan is anticipated to be established adjacent to occupied beetle habitat, which Collinge *et al.* (2001) has identified as a key factor in increasing the likelihood a conservation site will be colonized by VELB. The avoidance and protection measures are designed to minimize effects on elderberry shrubs, thus reducing the likelihood of indirect effects on and take of the VELB.

The actual acreage and magnitude of benefits, however, are not presently known; sites have not yet been identified, acquired, or restored. Also, the actual number of elderberries that will be planted on the acreage is unknown at this time.

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section, because they require separate consultation pursuant to section 7 of the Act.

The entire Project Area is within the right-of-way, easements or franchises of the transmission lines and associated access roads. However, Pacific Gas and Electric Company does not have exclusive easement rights on private lands nor is the Company always the sole occupant of franchise areas. Other state or private activities affecting the VELB are expected to occur within these rights-of-way, easements or franchises. Any major project maintenance or reconstruction activities planned by Pacific Gas and Electric Company will have advance and separate authorization from appropriate agencies.

There are numerous concurrent, ongoing resource management activities within the project area that contribute to potential adverse cumulative effects. The major management activities that have the potential of influencing the VELB include cattle grazing, extensive agricultural development, timber harvesting, fuel wood cutting, fire suppression, road building, levee

maintenance, and herbicide use. Continued human population growth in the Central and San Joaquin Valley's and foothills, in general, is expected to drive further development of agriculture, cities, industry, transportation, and water resources in the foreseeable future. These future activities may not be subject to Section 7 consultation (and thus are considered to enter into cumulative effects), and are likely to result in loss of riparian and other habitats where elderberry shrubs and the VELB occur. These activities are not associated with the proposed project.

Some of the aforementioned activities affecting the VELB involve effects on elderberry shrubs located within riparian ecosystems adjoining or within jurisdictional wetlands. These projects will be evaluated via formal section 7 consultation between the Service and the: (1) Army Corps of Engineers via section 404 of the Clean Water Act; (2) the BLM via issuance of rights-of-way or other BLM activities; and (3) the FS via issuance of special use authorizations or other Forest Service activities. There are, however, a number of projects for which there is no Federal permitting, authorization, or funding involved and for which no assistance, coordination, consultation or incidental take permitting is sought. These projects include unauthorized riprapping, levee maintenance, small-scale development and natural events such as fire and flood. These unauthorized projects and/or natural events, taken together, pose a significant threat to the recovery of the VELB, particularly when they result in the removal of elderberry savannah ecosystems. These foothill/upland landscapes often consist of mixed stands of elderberry shrubs and oak (*Quercus* spp.) trees interspersed with open grasslands. Elderberry shrubs in these savannah systems often achieve great size, due perhaps to the lack of light competition from broadleaf trees and/or entanglement with California wild grape (*Vitus californica*) vines, as often occur in riparian communities. Elderberry savannah communities are important in that they represent a large portion of the diverse habitat in which elderberry shrubs occur and because urban sprawl threatens a significant acreage of these systems. The loss of this habitat negatively affects the environmental baseline of the subspecies and is difficult to quantify.

Conclusion

After reviewing the current status of the valley elderberry longhorn beetle, the environmental baseline for the action area, the effects of the proposed project, and the cumulative effects, it is the Service's biological opinion that the project, as proposed, is not likely to jeopardize the continued existence of the valley elderberry longhorn beetle. Critical habitat has been designated for the valley elderberry longhorn beetle, however, this action does not affect these areas.

INCIDENTAL TAKE STATEMENT

Section 9(a)(1) of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened wildlife species, respectively, without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not

limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are non-discretionary, and must be implemented by the FS and BLM so that they become binding conditions of any grant, permit, or license issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The FS and BLM have a continuing duty to regulate the activity covered by this incidental take statement on lands administered by those agencies and consistent with the Memorandum of Understanding ("MOU") signed by the Service, the FS, the BLM and the Pacific Gas and Electric Company on January 10, 2003. If the FS and/or BLM (on their respective jurisdictional lands, as appropriate and within the scope of the MOU) (1) fail to adhere to the terms and conditions of the incidental take statement and/or (2) fail to retain oversight to ensure compliance with these terms and conditions consistent with said MOU, the protective coverage of section 7(o)(2) may lapse.

Amount or Extent of Take

The Service expects that incidental take of the valley elderberry longhorn beetle will be difficult to detect or quantify. The cryptic nature of the species and their relatively small body size make the finding of a dead specimen unlikely. The species occurs in habitat that makes them difficult to detect. Due to the difficulty in quantifying the number of beetles that will be taken as a result of the proposed action, the Service is quantifying take incidental to the project as based upon the numbers of elderberry located adjacent to Pacific Gas and Electric Company facilities, including those that are part of hydroelectric projects, as well as those expected due to future growth in and around Company facilities, and which are affected by Company activities for the 30-year term of the respective FS and BLM permits.

It is thus anticipated that all beetles inhabiting up to 250 plants per year for 30 years (a total of 7,500 elderberry shrubs) may need to be trimmed or otherwise directly affected as a result of this proposed action. It is also anticipated that a relatively small number of plants (20 per year, for 30 years; a total of 600 elderberry shrubs) would need to be removed in their entirety (versus trimming or pruning) as a result of this proposed action, due, for example, to their locations within facility access roads.

If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring review of the reasonable and prudent measures provided. The Pacific Gas and Electric Company, through the FS and/or BLM, must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

Upon implementation of the reasonable and prudent measures, below, incidental take of the beetle associated with the Project in the form of harm, harassment, or mortality from habitat loss or direct mortality, will become exempt from the prohibitions described under section 9 and regulations pursuant to section 4(d) of the Act; in addition, incidental take in the form of harm, harassment, injury, or mortality associated with indirect effects of the Project will be exempted.

Note that the overall incidental take identified above is relevant to system-wide effects on Federal and non-Federal lands. The following subsections describe the estimated incidental take that would occur by Federal land jurisdiction covered in the transmission separation projects that are the subject of this consultation (i.e. certain National Forest System Lands and Public Lands administered by the BLM) and in the remainder of the project area (including private lands, State, County, and City lands, Federal lands administered by the Bureau of Reclamation, National Wildlife Refuges, non-transmission separation project lands administered by the FS and BLM, etc.).

National Forest System Land Incidental Take Associated with Transmission Separation Project

The Pacific Gas and Electric Company previously estimated that up to 30 elderberry shrubs would be directly affected (pruned or removed) by vegetation management activities on 646 acres of NFS Lands within the Plumas, Sierra and Sequoia National Forests over the 30-year project life (900 plants). Some potential indirect affects close to project activities also were estimated in the BA, although specific indirect take assumptions and allowances are not required in the context of this incidental take statement, which relies upon the implementation of the VELB Conservation Program and reasonable and prudent measure identified herein.

It is thus anticipated that the Pacific Gas and Electric Company will incidentally take all valley elderberry longhorn beetles inhabiting up to 900 plants on 646 acres of NFS lands in the Plumas, Sierra and Sequoia National Forests will be incidentally taken (killed or injured).

Public Land Incidental Take Associated with Transmission Separation Project

The Pacific Gas and Electric Company previously estimated that up to 27 elderberry shrubs would be directly affected (pruned, removed, or indirectly affected) by vegetation management activities on 200 acres of Public Lands administered by the BLM acres over the 30-year project life (810 plants).

It is thus anticipated that the Pacific Gas and Electric Company will incidentally take all valley elderberry longhorn beetles inhabiting up to 810 elderberry shrubs on 200 acres of Public Lands administered by the BLM acres over the 30-year project life.

Project-Wide Incidental Take Other Lands

The net difference between the total effects identified in the second of the introductory paragraphs in the Amount or Extent of Take section, above, represents the estimated in incidental take on lands not administered by the FS or BLM as part of the Transmission Separation Project. It is thus anticipated that the Pacific Gas and Electric Company will incidentally take (kill or injure) all valley elderberry longhorn beetles inhabiting up to 213 elderberry shrubs per year directly affected by the proposed action on other-than NFS or BLM lands that are part of the Transmission Separation Project (270 elderberry shrubs per year, minus 30 elderberry shrubs on NFS Transmission Separation Project Lands and 27 per year for BLM Transmission Separation Project Public Lands). In the event there is less than the permitted quantity of incidental take on NFS or BLM Transmission Separation Project lands (30 and 27 elderberry shrubs, respectively), additional take on non-NFS or BLM Transmission Separation Project lands shall be allowed, but only insofar as the total take for public or private lands herein does not exceed 270 shrubs per year.

Effect of the Take

The Service has determined that this level of anticipated take is not likely to result in jeopardy to the valley elderberry longhorn beetle or result in destruction or adverse modification of its critical habitat.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measure is necessary and appropriate to minimize the effects of incidental take of the beetle from the Project:

Minimize the effects of project effects on the beetle and its habitat (elderberry shrubs).

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the FS, BLM and Pacific Gas and Electric Company as an applicant must comply with the following non-discretionary terms and conditions[1], which implement the reasonable and prudent measure described above.

The BLM indicated to the Service in a February 21, 2003, letter (BLM file number 6840(P), CA-930) that the agency will include in its right-of-way grants, either by reference or as an enclosure,

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[1]The Terms and Conditions herein, including the specific Reporting Requirements, serve to incorporate the measures already proposed under the Pacific Gas and Electric Company VELB Conservation Plan into this biological opinion. The Service has noted that FS and BLM jurisdictions associated with the Transmission Separation Project are limited to 646 and 200 acres of NFS and Public Lands, respectively.

the Terms and Conditions contained herein as they apply to the 200 acres of Public lands subject to the proposed action. Similarly, the Service is limiting the FS's nondiscretionary adherence to these terms and conditions to Pacific Gas and Electric Company actions on the 646 acres of NFS lands containing beetle habitat and subject to the proposed action. The activities conducted by the Pacific Gas and Electric Company as an applicant on other-than-NFS and Public Lands are subject to the Terms and Conditions below, as was established in the MOU.

The following terms and conditions implement the reasonable and prudent measure:

1. The Pacific Gas and Electric Company, in accordance with the VELB Conservation Program and MOU executed between the Company, the Service, FS and the BLM on all project-related activities, shall provide incremental funding over eight years, in an escrow or other appropriate account, for acquisition and/or long-term management of 1,000 acres of high quality habitat near or adjacent to existing VELB populations of the Sacramento and San Joaquin Valleys (125± acres/year, on an average annual basis). This provision of funding shall begin within 18 calendar months of the date of issuance of this Biological Opinion and after appropriate habitat identification.

2. The Pacific Gas and Electric Company, the FS, and the BLM shall minimize the effect of direct effects (trimming, removing) and indirect effects by implementing the avoidance and minimization measures contained in the Conservation Program as follows:

   A. When the Pacific Gas and Electric Company is undertaking routine maintenance activities in an area of potential VELB habitat, a qualified individual will survey for the presence of elderberry plants within a minimum of 20 feet from the work site within the utility easement, right-of-way, franchise or license and flag those areas needed to avoid or minimize potential effect on elderberry plants. Potential VELB habitat is defined as elderberry plants with one or more stems measuring one inch or greater in diameter at ground level at sites throughout California's Central Valley and associated foothills from about 3,000 feet in elevation on the east to the watershed divide of the Central Valley on the west (the western valley watershed divide is often at altitudes of less than 3,000 feet). If no elderberry plants meeting these criteria are present, no additional minimization, avoidance and protective measures are required.

   B. Routine Vegetation Management-Related Operations and Management Activities associated with Gas and Electric Transmission/Distribution Facilities Operation and Maintenance covered in the VELB Conservation Program.

      i. When elderberry occurs within the work area (e.g. actual work on an elderberry or other vegetation management work within 20' of an elderberry), a qualified individual (Pacific Gas and Electric Company employee or contractor) shall survey and "flag" at least twenty feet from

the drip line of each elderberry plant with pin-flagging, or other appropriate means, prior to commencing maintenance activities. Work crews shall be briefed on the location of habitat and shall review the avoidance, protection and minimization measures set forth herein. Briefings shall be each morning prior to commencing planned work and shall be tailored to the specific work area to be covered during the day. Pacific Gas and Electric Company shall be responsible for ensuring that personnel minimize any ground disturbance within 20 feet of elderberry.

ii. Pacific Gas and Electric Company shall not use herbicides (where use of herbicides is permitted) within approximately 20 feet of elderberry, except for cut stump treatment of removed trees and to help ensure compliance with California Public Resources Code Section 4292 (i.e., subject pole clearing at base of certain power poles or towers).

iii. Trees in the vicinity of an elderberry plant shall be directionally felled away from the plant so as to avoid the 20-foot zone around the elderberry plant, where possible. If there is potential to inadvertently fell a tree into the 20-foot zone, the tree shall be removed in sections. When a fallen tree is lopped and scattered, resulting material shall not be placed within the 20-foot zone around the elderberry plant.

iv. When trimming non-elderberry plants or trees in the vicinity of an elderberry plant, only trim shrubs or trees when necessary to comply with Public Resources Code Sections 4292 and 4293, or other applicable State laws. The Pacific Gas and Electric Company shall ensure that trimmed materials do not fall into the elderberry plant and that, to the extent practicable, no other disturbance occurs to the elderberry plant.

v. If the ground is disturbed during a vegetation management activity, appropriate erosion control measures shall be implemented to prevent movement of soil or other material into the 20-foot zone around elderberry plants.

vi. Vehicles required to perform vegetation management activities shall avoid the 20-foot zone around an elderberry plant to the extent practicable.

vii. Trimming, rather than removal of elderberry plants, shall be preferentially used where feasible and except where otherwise authorized by the Service consistent with the biological opinion.

C. Routine Non-Vegetation Management-Related Management and Maintenance Activities associated with Gas and Electric Transmission/Distribution Facilities and other Pacific Gas and Electric Company Facilities Covered by the VELB Conservation Program.

i. When Pacific Gas and Electric Company is undertaking routine maintenance activities in an area of potential VELB habitat, a qualified individual (Company employee or contractor) shall survey for the presence of elderberry plants within a minimum of 20 feet from the work site (defined as the area of actual work and potential ground disturbance including access and material and equipment staging and lay down area). The qualified individual shall "flag" at least twenty feet from the drip line of each elderberry plant with standard construction tape, or other appropriate means, prior to commencing maintenance activities.

ii. When elderberry occurs within the work area or within 20' of the work area, the qualified individual shall brief field workers on the location of the plant(s) and shall review the avoidance, protection and minimization measures set forth herein. Pacific Gas and Electric Company qualified individuals shall be responsible for insuring that maintenance personnel minimize any ground disturbance within 20 feet of elderberry.

iii. If ground-disturbing activities are planned, the qualified individual shall incorporate erosion control measures into the work plan to prevent movement of soil or other materials into the 20-foot zone around each elderberry plant. The work plan shall also consider maintaining the site's hydrological condition so as not to increase or decrease the flow of water to an elderberry plant.

iv. The qualified individual shall survey all project access roads prior to performing routine road maintenance or road grading associated with a routine transmission/distribution facility maintenance activity. The qualified individual shall "flag" at least twenty feet from the drip line of each elderberry plant with pin flagging, or other appropriate means, prior to commencing maintenance activities. In certain situations, elderberry plants are located on or immediately adjacent to project access roads. If at all possible, road maintenance activities shall avoid removing the elderberry plant. In addition, the qualified individual shall develop a work plan to prevent movement of soil within the 20-foot zone of an elderberry plant.

v. Any vehicles that travel near elderberry plants shall avoid the 20-foot zone around the elderberry plants unless the plants are immediately on or adjacent to an existing project access road.

D. Emergency Activities.

If Pacific Gas and Electric Company must undertake emergency activities in areas of potential VELB habitat, Pacific Gas and Electric Company shall not remove or otherwise disturb any elderberry plant or any vegetation within twenty feet of the drip line of elderberry unless required to do so to restore utility service or to meet public safety or fire prevention regulations. Following restoration of utility service Pacific Gas and Electric Company shall inspect the emergency work site area for damage to elderberry and restore the disturbed surface area to natural conditions as much as practical.

3. Transmission System Corridor Management

Pacific Gas and Electric Company shall manage its utility corridors for public safety and reliable electric and gas service by converting right-of-way plant communities from predominately tall-growing plant species to communities dominated by low-growing plant species, utilize an integrated vegetation management program on its right-of-ways, and employ best management practices that are designed to protect wildlife, groundwater, surface water, soils and the general public, all within the limits of state law requirements and landowner restrictions. In addition, Pacific Gas and Electric Company shall promote the Wire Zone/Border Zone, or successor approach, to vegetation management along electric transmission right-of-ways.

4. Argentine Ants.

The VELB Conservation Program calls for the acquisition of habitat, and not for replanting of elderberry shrubs. In the event, however, that elderberries and associated native vegetation are planted in the conservation areas, such plants shall be visually inspected for Argentine ants to make best efforts to ensure no Argentine ants will be introduced from seedling sources (nurseries, cuttings, etc.).

5. Reporting Requirements.

Ensure compliance with the Reporting Requirements below.

Conclusion

The reasonable and prudent measure, with its implementing terms and conditions, are designed to minimize the effect of incidental take on the beetle that might otherwise result from the

proposed action. With implementation of these measures, the Service believes that (1) all beetles associated with the 250 elderberry plants per year for 30 years anticipated to be affected by the proposed project shall be minimized; (2) no more than 20 elderberry plants per year for 30 years shall be removed; and (3) no more than the number of beetles inhabiting these elderberry plants will be incidentally taken as a result of Company routine operation and maintenance activities. If, during the course of the action, this level of incidental take is exceeded, such incidental take would represent new information requiring review of the reasonable and prudent measures provided. The FS and/or BLM, as appropriate, and Pacific Gas and Electric Company, as the applicant, must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the incidental take statement and its reasonable and prudent measures. This incidental take statement authorizes take at the above-referenced levels for a term of 30 years.

Reporting Requirements and Monitoring Plan

The Pacific Gas and Electric Company will identify VELB habitat locations during routine operation and maintenance of its facilities (where VELB could be affected) and will continue to develop and maintain, a database of this information. The Company will track effects (pruning, removal, or other acute disturbances) to individual elderberry plants on an annual basis. The Company will provide the Service with a biennial monitoring report, for the first six years of the program (three reports), and every five years thereafter. This monitoring report will summarize VELB habitat locations associated with annual effects on elderberry. The monitoring report will also describe the results of a more detailed representative survey of a limited and mutually agreed upon percentage of VELB habitat affected by Pacific Gas and Electric Company routine operation and maintenance activities. The detailed survey will be conducted by a qualified biologist on an appropriate limited sampling of VELB habitat affected during the preceding year.

The sampling will be conducted across a representative range of potential VELB habitat affected by routine Company operation and maintenance activities. The detailed survey described in the monitoring report will collect information on global position, habitat type, evidence of historic beetle occupancy, effect type and date, and the general condition of the plant. Maps of survey locations, cumulative effect tallies, and analyses of effects, beetle sign, and habitat types will be provided in the report. Any occurrence of dead or injured beetles or larvae will also be described in the report. The monitoring report will also include information on the progress of the Company's VELB Conservation Program toward the acquisition, development, and/or protection of VELB habitat or the status of areas already acquired.

Monitoring of project effects and implementation of conservation measures will provide a foundation for adaptive management and allow for modification of the plan based upon the mutual agreement of the Company and the Service. Any adaptive management evaluation will take into consideration the level of conservation provided by the program, which may exceed, by a significant margin, the potential effects associated with the activities covered.

The Sacramento Fish and Wildlife Office is to be notified immediately of the finding of any listed species or any unanticipated harm to the valley elderberry longhorn beetle. The Service contact person for this is the Division Chief for Endangered Species at (916) 414-6600. Any dead or severely injured beetles found (adults, pupae, larvae, or eggs) shall be deposited in the Entomology Department of the California Academy of Sciences. The Academy's contact is the Senior Curator of Coleoptera at (415) 750-7239. All observations of valley elderberry longhorn beetles in any life stage-live, injured, or dead-or fresh beetle exit holes shall be recorded on CNDDB field sheets and sent to California Department of Fish and Game, Wildlife Habitat Data Analysis Branch, 1416 Ninth Street, Sacramento, California 95814. Any dead or severely injured beetle shall be transferred to the Fish and Wildlife Service's Law Enforcement Office at 2800 Cottage Way, W-2605, Sacramento, California, 95825-1846.

The Pacific Gas and Electric Company shall notify the Service immediately if any listed species are found on site, and will submit a report including date(s), location(s), habitat description, and any corrective measures taken to protect the species found. A Service-approved biologist shall submit locality information to the CDFG, using completed California Native Species Field Survey Forms or their equivalent, no more than 90 calendar days after completing the last field visit of the project site. Each form shall have an accompanying scale map of the site such as a photocopy of a portion of the appropriate 7.5 minute U.S. Geological Survey map and shall provide at least the following information: township, range, and quarter section; name of the 7.5' or 15' quadrangle; dates (day, month, year) of field work; number of individuals and life stage (where appropriate) encountered; and a description of the habitat by community-vegetation type. The Service-approved biologist shall also provide a high quality copy of this information to the staff biologist, California Department of Fish and Game, 1807 13th Street, Sacramento, California 95814.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities that can be implemented to further the purposes of the Act, such as preservation of endangered species habitat, implementation of recovery actions, or development of information and data bases. The FS, BLM, and Pacific Gas and Electric Company should assist in the recovery of the valley elderberry longhorn beetle by funding and/or undertaking an assessment of where beetle habitat is most needed within its range (for example, where gaps in suitable habitat occur). This information should then be made available to the Service, other agencies, project applicants, and conservation organizations, in an effort to coordinate the needs of both the development and environmental conservation communities.

The FS, BLM and Pacific Gas and Electric Company should assist in recovery of the valley elderberry longhorn beetle by funding and/or undertaking a research effort to study (1) the factors that promote VELB occupancy and abundance; (2) VELB's natural enemies; and (3) the effects

of commonly used landscaping practices on elderberry and VELB, including vegetation management practices (pruning) of electric utilities.

The FS, BLM and Pacific Gas and Electric Company should assist the Service in implementing recovery actions identified in the Valley Elderberry Longhorn Beetle Recovery Plan.
In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION–CLOSING STATEMENT

This concludes formal consultation on the Pacific Gas and Electric Company Transmission Separation Project, located in the Plumas, Sequoia, and Sierra National Forests within Butte, Plumas, Madera and Fresno Counties; in the Redding, Folsom, and Bakersfield Districts within Madera, Fresno, Amador, Calaveras, Tuolumne, Nevada, Placer, Butte, Yuba, Shasta and Tehama Counties; and Various Other Jurisdictions, California. As provided in 50 C.F.R. § 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals that the agency action may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect on the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the anticipated amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Please address any questions or concerns regarding this response to Jason Douglas or Justin Ly of my staff at (916) 414-6645.

Sincerely,

Wayne S. White
Field Supervisor

cc:
ARD-ES, Portland, OR
NOAA Fisheries, Sacramento, CA (Attn: Mike Aceituno)
NOAA Fisheries, Santa Rosa, CA (Attn: James Bybee)
CDFG, North Coast Region, Redding, CA (Attn: Don Koch)

CDFG, Central Sierra Region, Rancho Cordova, CA (Attn: Banky Curtis)
CDFG, Central Coast Region, Napa, CA (Attn: Rob Floerke)
CDFG, Southern Sierra Region, Fresno, CA (Attn: Bill Loudermilk)
Latham and Watkins, Washington D.C. (Attn: David Hayes, Janice Schneider)
Pacific Gas and Electric Company, San Ramon, CA (Attn: Diane Ross-Leech, Robert Knutson)

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