
E-11: Line 407 West Valley Elderberry Longhorn Beetle Survey

Valley Elderberry Longhorn Beetle Survey

**PG&E Line 407 West Natural Gas Transmission Pipeline
Yolo and Sutter Counties, California**

August 2007



Prepared for:

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Appendix A – PG&E Line 407 West Natural Gas Transmission Pipeline VELB Survey Summary.

**PG&E Line 407 West Natural Gas Transmission Pipeline
Yolo and Sutter Counties, California**

July 2007

Summary of Findings and Conclusions

On May 8 and 14, 2007, Gallaway Consulting, Inc. conducted an elderberry (*Sambucus mexicana*) stem count and valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) survey within the PG&E line 407 West Natural Gas Transmission Pipeline biological survey area (BSA). The valley elderberry longhorn beetle (VELB) is federally listed as threatened and the US Fish and Wildlife Service (USFWS) has designated critical habitat for this species. Although designated critical habitat for VELB does not occur within the BSA, suitable VELB habitat does occur and was surveyed. Surveys focused on classifying the number of elderberry stems measuring ≥ 1 inch at ground height, and documenting the presence of VELB.

We detected emergence holes on 43% (10 out of 23 bushes) of mapped elderberry bushes occurring within the BSA. Only clean-cut holes of the proper size and shape were considered to be evidence of VELB habitation. No adult beetles were observed during surveys. The physical condition of the elderberry plants varied from poor to good with overall vegetative condition being good.

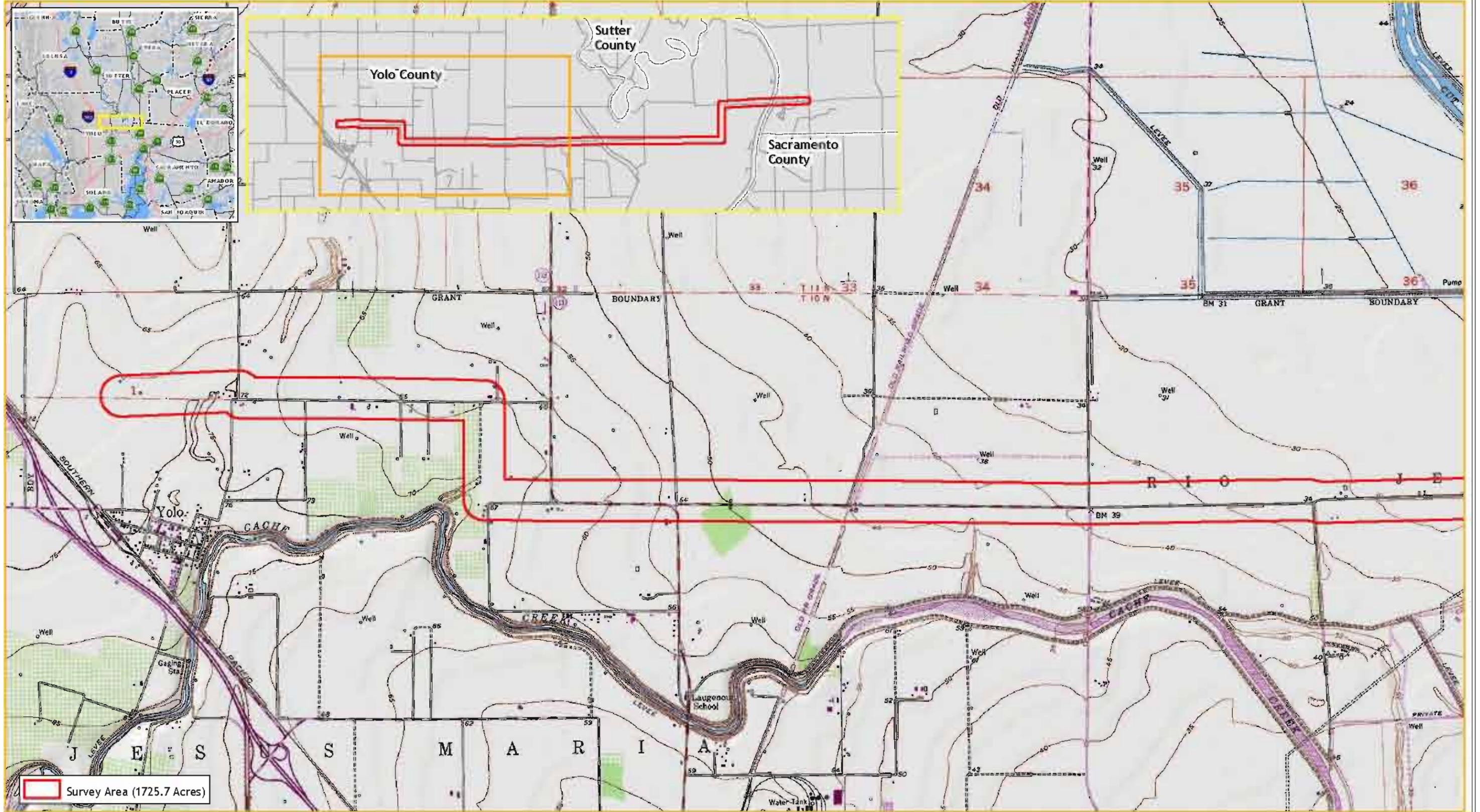
The USFWS considers complete avoidance of elderberry bushes to occur when all project activities remain at a distance greater than 100 feet from existing bushes. Proposed construction activities will occur within 100 feet of elderberry plants and potentially within the minimum 25-foot buffer required by the USFWS. Construction activities that cannot avoid VELB habitat when these buffers are applied will require appropriate mitigation, as set forth in the *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS 1999). Section 7 consultation will be required and the U.S. Army Corps of Engineers (USACE) will initiate consultation with the USFWS.

I. Introduction

PG&E is planning to construct the Line 407 West Natural Gas Transmission Pipeline Project (Project) to address the need for additional natural gas supply to serve on-going residential and commercial growth in the greater Sacramento River Valley region within Yolo and Sutter Counties. Line 407 West is one of three natural gas transmission pipeline segments that are planned for construction between 2009 and 2012 to supply natural gas to the region. The project includes approximately 13.5 miles of 30-inch-diameter pipeline operating at 975 pounds per square inch gauge (psig) and transporting up to 180,000,000 cubic feet of natural gas per day between existing Line 172A and the tie-in with proposed Line 407 East near the intersection of Powerline and Riego roads in Sutter County. Line 407 West will run east from Line 172A through an area rich in agricultural production, and will cross Knights Landing Ridge Cut, the Yolo Bypass, Tule Canal, a number of unnamed irrigation canals, and the Sacramento River.

Gallaway Consulting, Inc. (GCI) performed an elderberry stem count and valley elderberry longhorn beetle (VELB) survey within the Project biological survey area (BSA) in Yolo and Sutter Counties, California (**Figure 1**). Surveys were conducted on May 8 and 14, 2007 and were focused on classifying the number of elderberry stems measuring ≥ 1 inch at ground height, and documenting the presence of VELB emergence holes.

The valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) is federally listed as threatened and critical habitat has been designated by the USFWS. The beetle is endemic to riparian systems along the margins of rivers and streams, and in adjacent grassy savannas in California's Central Valley. The VELB feed on two species of elderberry including blue elderberry (*Sambucus mexicana*) and red elderberry (*Sambucus racemosa*). The adult female beetle deposits eggs in the crevices of the bark of living plants. The larvae bore into the pith of the larger elderberry stems where the majority of the animal's life span is spent. Following pupation in the spring, the adult beetle emerges, creating a hole in the bark of the stem or branch. Adults feed on foliage and are present from March through early June. Because the adult stage is short lived, survey techniques focus on the presence of emergence holes for evidence of VELB. Emergence holes have been observed in shoots or branches with diameters as small as 0.5 inches (13 mm) but are more common in older, larger branches (DWR 2000). Exit holes are circular or slightly oval and are usually 7-10 mm in diameter. The VELB is the only insect species known to inhabit live elderberry wood and/or make exit holes of a similar size and shape in the Central Valley (USFWS 1991). The VELB is known to occur throughout the California Central Valley and its associated foothills from the valley floor up to 3,000 feet of elevation.



Within the Rio Jesus Maria Land Grant and Sect 1 of T10N & R1E, Sect 1 of T10N & R2E, Sects 9, 10, 11, 12 of T10N & R2E, Sects 5, 6 of T10N & R4E, Sect 36 of T11N & R3E, and Sect 31 of T11N & R4E
 On El Dorado Bend, Knights Landing, Verona, Woodland, Grays Bend, and Taylor Monument at 7 1/2 USGS Quads
 Map Date 6/29/07

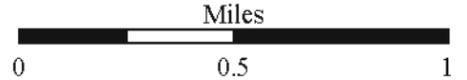
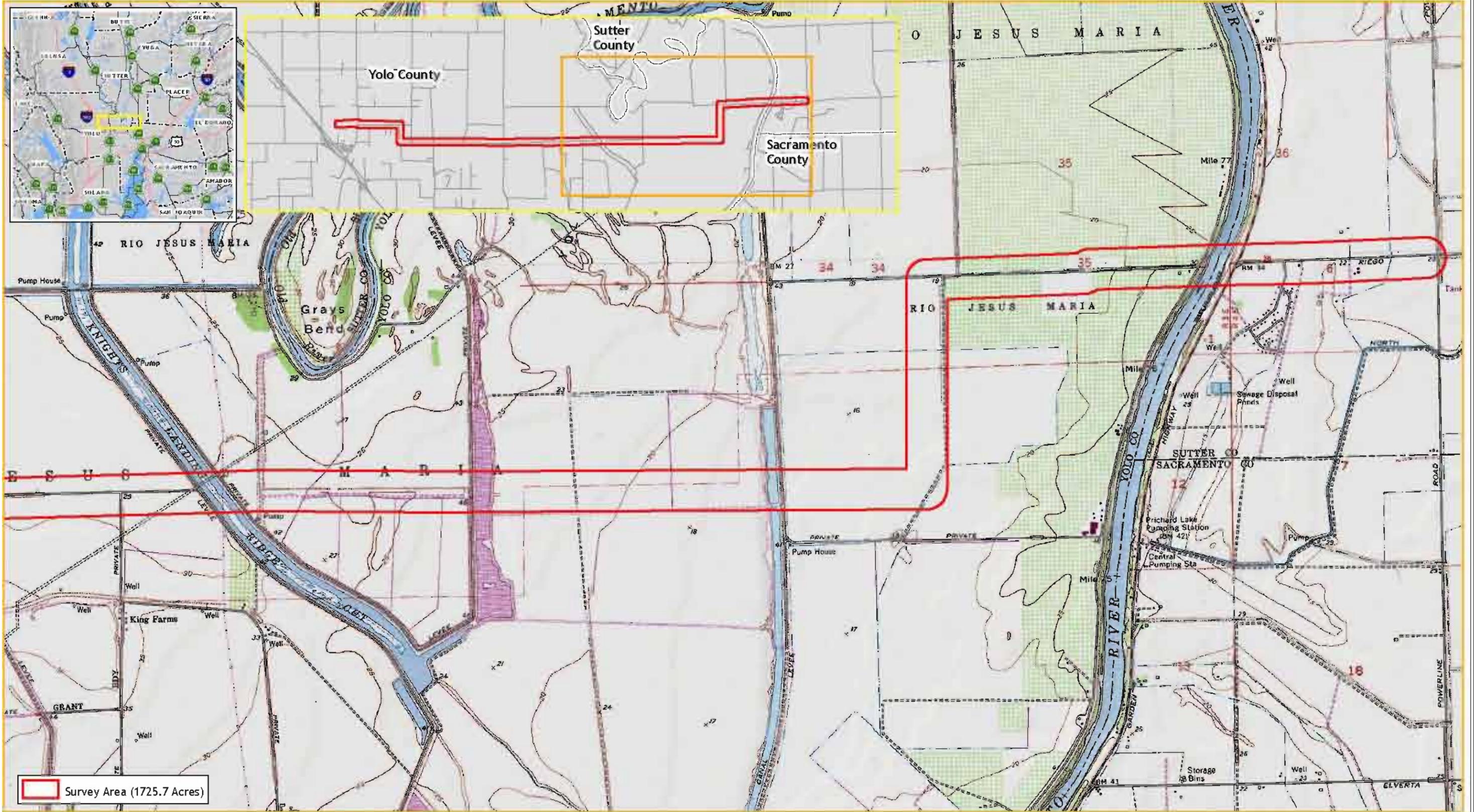


Figure 1a



Survey Area (1725.7 Acres)

↑
 Within the Rio Jesus Maria Land Grant and
 Sect 1 of T10N & R1E, Sect 1 of T10N & R2E,
 Sects 9, 10, 11, 12 of T10N & R2E, Sects 5, 6 of T10N & R4E
 Sect 36 of T11N & R3E, and Sect 31 of T11N & R4E
 On El Dorado Bend, Knights Landing, Verona, Woodland,
 Grays Bend, and Taylor Monument 7 1/2 USGS Quads
 Map Date 6/29/07

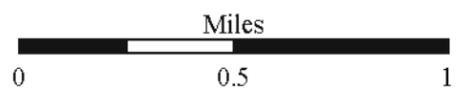


Figure 1b

II. Study Methods

Survey Area

The study area encompasses a 1725.75-acre corridor of rural, urban, and developed land in portions of Grays Bend, Woodland, Verona, and Taylor Monument USGS 7.5' quadrangles (**Figure 1**). Topography is flat due to historical farming and grading practices with project elevation ranging from 15-125 feet above sea level. Rural residential, agricultural structures, and agricultural fields occupy the extent of the study area.

Field Techniques

Efforts focused on classifying the number of elderberry stems measuring ≥ 1 inch at ground height, and documenting the presence of VELB emergence holes. For the purposes of the survey, riparian habitat was defined as habitat occurring within 25-feet of the waterway. A bush was defined as an assemblage of individual elderberry plants, including discrete bush-like groups with multiple shoots/stems/trunks, or larger discrete clumps. Stems of mapped elderberry bushes measuring ≥ 1 inch at ground height were quantified and examined for evidence of the VELB by scanning the foliage, trunk and branches for exit holes. Binoculars were sometimes used to scan the external canopy of larger, denser stands, while the trunks and branches were checked with the unaided eye.

All holes with the following characteristics were assumed to be VELB emergence holes: 1) recent (i.e. current-year), clean-cut with fresh, light colored wood inside; 2) old (i.e. not made this year), but clean-cut and undamaged, wood inside discolored; 3) partly healed (i.e. hole partially closed by growth); and 4) healed (i.e. hole completely occluded resembling an opening closed by a drawstring), cut-out circle usually still obvious in the bark. Old holes, or holes that were substantially eroded and/or enlarged by other insects, rot, or birds were not counted. Only holes in good condition and of the proper size and shape (i.e., clean-cut, circular or slightly oval, and 7-10 mm in diameter) were recorded as VELB exit holes.

III. Results

Elderberry stem counts and VELB surveys were conducted within the BSA on May 8 and 14, 2007 by Brooks Taylor, biologist, and Elena Alfieri, botanist. Twenty-three elderberry bushes occur within the BSA. Twenty-two elderberry bushes were evaluated for the potential presence of VELB, and one bush (**E23**) was not evaluated for potential presence of VELB due to its location within a homeowners yard. **Figure 2** depicts the location of elderberry bushes in relation to the Project area. Of these 23 bushes, 19 occurred along a canal adjacent to the Sacramento River in riparian habitat and four shrubs were within upland areas, one was inaccessible. Also, the survey area is not within designated critical habitat for VELB.



Elderberry surveying by EA, BT
Aerial Feb 2005 (NAIP)
Map Date June 27, 2007



Figure 2

Emergence holes were detected on a total of 10 elderberry shrubs within the BSA.

Out of 78 stems $\geq 1''$ in diameter at ground height counted, 64% were 1-3'', 22% were 3-5'' and 14% were $>5''$. Surveys were conducted during the period of adult emergence (March – early June); although, no adult beetles were observed. The physical condition of the elderberry plants varied from poor to good. **Table 1** summarizes the results of the survey. A complete survey summary is presented in **Appendix A**.

Table 1. Number of Elderberry Stems and Emergence Holes Found within the PG&E Line 407 West Natural Gas Transmission Pipeline BSA.

| Location (Percent of total) | | Number and size class of elderberry stems $\geq 1''$ at ground height for all bushes | | | Total number of VELB emergence holes detected | Total number of elderberry bushes with VELB emergence holes | Percent (%) of elderberry bushes with VELB emergence holes |
|--------------------------------|--------------|--|----|----|---|---|--|
| | | | | | | | |
| Riparian | Non-riparian | | | | | | |
| 19 | N/A | 38 | 16 | 11 | 10 | 10 | 53% |
| N/A | 4 | 12 | 1 | 0 | 0 | 0 | 0% |

IV. Conclusions and Determinations

In the Sacramento Valley, VELB is closely associated with blue elderberry, which is an obligate host for beetle larvae. The VELB appear to be attracted to “stressed” or unhealthy elderberry bushes (Kellner 1986). Stressed bushes have more yellow in the leaves and have leaves that fall earlier in the year than healthy bushes. Kellner (1986) found that elderberry bushes containing VELB holes appeared to be less healthy and have less foliage than trees without emergence holes.

Besides exhibiting a preference for “stressed” elderberry, VELB prefers bushes with stems of a certain size class. Exit holes have been found more frequently in trunks or branches that are 5 to 20 cm (2-8 in) in diameter (Kellner 1986), or at least 1.0 inch or greater at ground height (USFWS 1999) and less than one meter off the ground (Collinge *et al.* 2001). Research also shows that exit holes more consistently occur in clumps or stands than in isolated bushes (Collinge *et al.* 2001). In two different studies, occurrence frequencies in elderberry by VELB ranged from 20-50% along the American River (USFWS 1984), to usually less than 20% along the Sacramento River (Jones and Stokes 1985). Within the BSA, VELB occurred in 43% of all elderberry bushes surveyed.

Since the spatial distribution of VELB is often minimal (USFWS 1991), the beetle has been assumed to be a poor disperser (Collinge *et al.* 2001). Due to low dispersing ability and naturally low population densities (USFWS 1984), the beetles are thought to be more vulnerable to impacts from habitat fragmentation (USFWS 1999). Thus, non-fragmented stands of elderberry are essential for dispersal corridors for the species and may be necessary to maintain long-term gene flow over large areas.

Threats to the survival of VELB include the alteration and fragmentation of suitable habitat from urban and recreational development. Insecticide use and vegetation control practices may also impact beetle populations (USFWS 1999). In addition, Huxel (2000) postulated that the introduced, invasive Argentine ant (*Linepithema humile*) may exclude or displace populations of VELB from otherwise suitable habitat.

The proposed construction activities will occur within 100 feet of some elderberry plants onsite. Per USFWS 1999 Guidelines, when construction does occur within 100 feet of elderberry plants, where possible a minimum buffer of 25 feet from drip line will be implemented and strictly adhered to and the USFWS will be consulted. Since construction may occur within 25 feet of several elderberry plants impacts to one or several of the plants may occur, and mitigation will be required as set forth in the Guidelines. Section 7 consultation will be required and the U.S. Army Corps of Engineers (USACE) will initiate consultation with the USFWS. All areas to be avoided during construction will be fenced and flagged, and contractors and work crews will be briefed on the need to avoid damaging elderberry during construction and the possible penalties for not complying with these requirements. In areas where elderberry bushes cannot be avoided, they will be transplanted to a suitable area and re-planted along with additional elderberry seedling and associate plantings as described in **Table 2** if required by the USFWS. If construction impacts are of a brief enough duration and the USFWS approves, it may be possible to temporarily remove bushes from direct impact areas and replace them once trenching and installation of the pipeline is complete. Associated native plant and elderberry seedling planting ratios may be required even if impacts to elderberry bushes are temporary.

Table 2. Minimization Ratios Based on Location (Riparian vs. Non-riparian), Stem Diameter of Affected Elderberry Plants at Ground Level, and Presence or Absence of Exit Holes.

| Location | Stems (maximum diameter at ground level) | Exit Holes on Shrub Y/N (quantify) ¹ | Elderberry Seedling Ratio ² | Associated Native Plant Ratio ³ |
|--------------|--|---|--|--|
| Non-riparian | stems $\geq 1''$ & $\leq 3''$ | No: | 1:1 | 1:1 |
| | | Yes: | 2:1 | 2:1 |
| Non-riparian | stems $> 3''$ & $< 5''$ | No: | 2:1 | 1:1 |
| | | Yes: | 4:1 | 2:1 |
| Non-riparian | stems $\geq 5''$ | No: | 3:1 | 1:1 |
| | | Yes: | 6:1 | 2:1 |
| Riparian | stems $\geq 1''$ & $\leq 3''$ | No: | 2:1 | 1:1 |
| | | Yes: | 4:1 | 2:1 |
| Riparian | stems $> 3''$ & $< 5''$ | No: | 3:1 | 1:1 |
| | | Yes: | 6:1 | 2:1 |
| Riparian | stems $\geq 5''$ | No: | 4:1 | 1:1 |
| | | Yes: | 8:1 | 2:1 |

¹ All stems measuring one inch or greater in diameter at ground level on a single shrub are considered occupied when exit holes are present anywhere on the shrub.

² Ratios in the Elderberry Seedling Ratio column correspond to the number of cuttings or seedlings to be planted per elderberry stem (one inch or greater in diameter at ground level) affected by a project.

³ Ratios in the Associated Native Plant Ratio column correspond to the number of associated native species to be planted per elderberry (seedling or cutting) planted.

Mitigation Guidelines

Elderberry bushes impacted as a result of this project will require mitigation consistent with the 1999 *USFWS Conservation Guidelines for Valley Elderberry Longhorn Beetle* (Guidelines). According to the Guidelines, complete avoidance (i.e., no adverse effects) may be assumed when a 100-foot buffer is established and maintained around elderberry plants containing stems measuring 1.0 inch or greater in diameter at ground level. As a protective measure, all bushes within the project area should be fenced during the course of construction, and clean-up, to prevent disturbance. The USFWS must be contacted if encroachment within the 100-foot buffer is expected, and Section 7 Federal Endangered Species Act consultation is required if elderberry bushes will be disturbed as a result of project activities.

If complete avoidance of elderberry plants is not possible, transplantation may be necessary as prescribed by the Guidelines. However, at the discretion of the USFWS, a plant that would be extremely difficult to move because of access problems may be exempted from transplantation (USFWS 1999). Planting of additional seedlings or cuttings may be required under the mitigation guidelines, depending upon the absence or percentage of elderberry plants with emergence holes found in the project area.

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Appendix A

PG&E Line 407 West Natural Gas Transmission Pipeline VELB Survey Summary

Number of Elderberry Stems and Emergence Holes for Elderberry Bushes in the PG&E Line 407 West Natural Gas Transmission Pipeline, Yolo and Sutter Counties, California.

| Stand ID | Location | Exit Holes on Shrub Y/N | Number of Stems | | | Date Surveyed | Surveyor |
|----------|----------|----------------------------|-----------------|------|-----|---------------|----------|
| | | | 1-3" | 3-5" | >5" | | |
| 1 | Riparian | N | 4 | 2 | 0 | 5/14/2007 | BT |
| 2 | Riparian | Y(old) | 0 | 0 | 1 | 5/14/2007 | BT |
| 3 | Riparian | N | 3 | 0 | 0 | 5/14/2007 | BT |
| 4 | Riparian | Y | 6 | 0 | 1 | 5/14/2007 | BT |
| 5 | Riparian | N | 2 | 0 | 0 | 5/14/2007 | BT |
| 6 | Riparian | Y | 2 | 0 | 1 | 5/14/2007 | BT |
| 7 | Riparian | Y | 6 | 3 | 1 | 5/14/2007 | BT |
| 8 | Riparian | N | 3 | 2 | 0 | 5/14/2007 | BT |
| 9 | Riparian | Y | 2 | 1 | 1 | 5/14/2007 | BT |
| 10 | Riparian | Y | 2 | 2 | 1 | 5/14/2007 | BT |
| 11 | Riparian | Y | 2 | 2 | 2 | 5/14/2007 | BT |
| 12 | Riparian | N | 1 | 0 | 0 | 5/14/2007 | BT |
| 13 | Riparian | N | 2 | 0 | 0 | 5/14/2007 | BT |
| 14 | Riparian | N | 1 | 0 | 0 | 5/14/2007 | BT |
| 15 | Riparian | Y | 0 | 0 | 1 | 5/14/2007 | BT |
| 16 | Riparian | N | 1 | 1 | 0 | 5/14/2007 | BT |
| 17 | Riparian | N | 1 | 0 | 0 | 5/14/2007 | BT |
| 18 | Riparian | Y | 1 | 0 | 0 | 5/14/2007 | BT |
| 19 | Riparian | Y | 1 | 3 | 1 | 5/14/2007 | BT |
| 20 | Upland | N | 3 | 0 | 0 | 5/14/2007 | BT |
| 21 | Upland | N | 3 | 0 | 0 | 5/14/2007 | BT |
| 22 | Upland | N | 6 | 1 | 0 | 5/14/2007 | BT |
| 23* | Upland | * | * | * | * | 5/14/2007 | BT |

* This bush was not evaluated due to its location in a private backyard.