
APPENDIX 4.3-3
ELDERBERRY INVENTORY REPORT
ENTOMOLOGICAL CONSULTING SERVICES
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Appendix B Elderberry Inventory Report

ELDERBERRY INVENTORY REPORT
FOR THE CERES MARKETPLACE
PROJECT IN CERES, CA

Prepared for:
Denise Duffy & Associates, Inc.
947 Cass Street, Suite #5
Monterey, CA 93940

Prepared by:
Richard A. Arnold, Ph.D.
Entomological Consulting Services, Ltd.
104 Mountain View Court
Pleasant Hill, CA 94523
(925) 825-3784

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INTRODUCTION

Blue elderberry (*Sambucus mexicana*: Caprifoliaceae) grows in one location on the proposed Ceres Marketplace project site in the City of Ceres (Stanislaus County), CA. The proposed Ceres Marketplace is a 26-acre site that is located immediately east of Highway 99, and is bounded by Don Pedro Road on the north, Mitchell Road on the east, and East Service Road on the south. Development of the proposed Ceres Marketplace shopping center and other associated site improvements could adversely affect the elderberry plants growing there.

Blue elderberry is the sole food plant for the Valley Elderberry Longhorn beetle (VELB), *Desmocerus californicus dimorphus* (Coleoptera: Cerambycidae). The VELB is recognized as a threatened species pursuant to provisions of the federal Endangered Species Act of 1973, as amended. Removal of the beetle's elderberry food plant is interpreted as "take" of the threatened beetle's habitat as defined by the Endangered Species Act. Lawful removal of the elderberry food plant of the VELB can be performed after obtaining a permit for incidental take from the U.S. Fish & Wildlife Service (USFWS).

This report describes the findings of an inventory survey of the resident elderberry plants that was performed in March 2007 at the Ceres Marketplace project site. The purpose of the inventory was to acquire information on the resident elderberry plant to identify potential impacts of the proposed shopping center project and to determine appropriate mitigation measures.

Inventory data were collected at this site in accordance with the procedures described by the VELB conservation guidelines (USFWS 1999). Data from the inventory were used to perform a mitigation analysis for the elderberry plants that will be impacted by the project. The findings of the analysis were used to prepare a mitigation plan that discusses two alternative mitigation solutions, namely:

- a) purchase VELB conservation credits from an USFWS-approved conservation bank whose service territory includes the Ceres Marketplace project site; or
- b) obtain and protect a suitable mitigation site and revegetate it with the requisite number of elderberries and associated native plants and monitor it for a minimum of 10 years to demonstrate that the habitat restoration is successful.

BACKGROUND INFORMATION

In 1980, the USFWS recognized the Valley Elderberry Longhorn beetle (VELB) as a threatened species and designated two sites along the American River in the city of Sacramento as critical habitat (U.S. Fish & Wildlife Service 1980). The International Union for the Conservation Nature (IUCN) recognized the VELB as a vulnerable species in its 1990 Red List of Threatened Animals (IUCN 1990). The vulnerable category of the IUCN is essentially equivalent to the threatened category of the USFWS. The California Natural Diversity Database

recognizes the beetle as a G3T2S2 taxon (California Dept. of Fish & Game 2007). A recovery plan for the VELB was published by the USFWS in 1984 (USFWS 1984).

The VELB was recognized as a threatened species because of loss and alteration of its riparian habitat and because it naturally occurs at low population densities. The VELB is generally found along waterways and in floodplains that support remnant stands of riparian vegetation. In particular, elderberry must be present, as both larvae and adults feed on this shrub or small tree. Larvae of the VELB feed internally on the pith of the trunk and larger branches, while adult beetles appear to feed externally only on elderberry flowers and foliage. Prior to metamorphosing into the adult life stage, VELB larvae chew an emergence or exit hole in the trunk of the elderberry, through which the adult beetle later exits the plant. The VELB's exit hole is about the diameter of a standard wooden pencil and somewhat oval in shape. Often there is some swelling on the trunk where the exit hole is found. Exit holes in the lower trunk of elderberries are characteristic of past VELB infestations. Several studies (cited in USFWS 1984 and Barr 1991) have found that exit holes generally occur between ground level and about six feet in height. Similar appearing holes in the upper trunk and branches may be due to other wood-feeding insects. However, Halstead (1991) has observed bona fide VELB exit holes as high as 25 feet in an elderberry.

Exit holes remain in the trunks of the elderberries even after the VELB has ceased to use a particular elderberry. For this reason, the exit hole can be used as an indicator of past infestation. Most exit holes that are observed on elderberries are older and difficult to date. However, recent holes can be readily distinguished based on the presence of larval frass or a pupal case of the VELB, fresh wood shavings, and non-oxidized wood. Unfortunately, these signs usually disappear within a few weeks after a VELB leaves the elderberry. As such, recent exit holes are detected rather infrequently. Several other types of insects usually live in the tunnels created by the VELB larvae. These invading insects and insect-feeding birds often enlarge or modify older VELB exit holes to feed on these secondary insect inhabitants in the VELB tunnels.

Surveys conducted subsequent to the beetle's recognition as a threatened species have demonstrated that the VELB is more widespread than originally believed. At this time, the VELB is known from widely scattered localities in the Central Valley. Adult specimens have been collected in locations ranging from the Kaweah River in Tulare County by Jeff Halstead (Barr 1991) to Red Bluff in Tehama County by Jones & Stokes Associates, Inc. (Jones & Stokes Associates, Inc. 1987). Exit holes have been observed in elderberries growing as far north as the Shasta-Tehama county line (Barr 1991) and as far south as Caliente Creek in Kern County (Shields 1990a and 1990b). The VELB has also been observed in the Sierran foothills, particularly in Fresno, Madera, and Placer counties. At these foothill locations, the VELB is not restricted to riparian habitats. The VELB is known from a few locations north of the City of Ceres, primarily from locations along the Tuolumne River (California Natural Diversity Data Base 2007; BUGGY Database 2007).

SURVEY METHODS

The Ceres Marketplace site was visited on March 1, 2007 to inventory the resident elderberry plants growing there. Prior to visiting the project site I drove throughout the surrounding neighborhood in an attempt to observe any nearby elderberry plants. The inventory of the resident elderberries was conducted in accordance with the Conservation Guidelines for Valley Elderberry Longhorn beetle (USFWS 1999). Based on this document, USFWS considers elderberries with a basal trunk diameter equal to or greater than (\geq) 1.0 inch to be habitat for the VELB.

All portions of the Ceres Marketplace project site were inspected to determine the presence or absence of any elderberry plants. As individual elderberry plants were observed, their locations were noted on the site map. At some unknown time prior to my site visit, someone had nailed numbered arborist tags to each elderberry using the numbers 936 through 940. These id numbers are used in Table 1. The following additional information was collected for each of the elderberry locations:

- a) total number of elderberry plants;
- b) growth form (i.e., clusters of plants, solitary plants, or plants with multiple trunks);
- c) number of trunks whose basal diameters measured \geq 1.0 inches;
- d) basal diameters of any trunks \geq 1.0 inch; and
- e) presence of verifiable VELB exit holes.

SURVEY RESULTS

Four elderberry plants were found growing at a single location in the southwestern portion of the Ceres Marketplace project site. No elderberry plants were observed at nearby properties in the surrounding neighborhood, so the four elderberry plants growing at the project site appear to be an isolated occurrence. Although a prior surveyor had attached five id tags to the elderberries, my survey indicates there are only four plants. Characteristics of the resident elderberries growing at these locations are summarized in Table 1. These characteristics are described in further detail in the remainder of this section.

The Ceres Marketplace project site supports only mature elderberry plants. Elderberries were observed growing as solitary plants and as single-trunk or multi-trunk trees. Basal trunk diameters ranged from 1.5 to 16 inches.

During the March 2007 inventory, a total of 4 elderberry plants were counted whose basal diameters were \geq 1 inch, a size considered to be habitat for the threatened VELB. The four plants grow in close proximity to one another and may share a common root below ground, but above ground they appear to be four distinct plants. These 4 plants supported 6 stems whose basal diameters measure \geq 1 inch. No bona fide exit holes of the VELB were observed on any of

these elderberries.

These findings were compared to the criteria that must be satisfied for inclusion under the USFWS's programmatic permitting for projects with relatively small effects on the VELB (USFWS 1996). Since the total number of elderberry plants (n = 4) to be impacted by the proposed project, does not exceed the maximum number of elderberry plants (n = 25) allowed to be impacted by a single project, it may be possible to permit the Ceres Marketplace under the aforementioned programmatic permit.

ELDERBERRY MITIGATION ANALYSIS AND PLAN

Mitigation Analysis.

The data collected during both elderberry inventories were used to prepare a mitigation analysis in accordance with the USFWS's (1999) VELB conservation guidelines. Because the full extent of potential impacts due to the proposed Ceres Marketplace project cannot be identified at this time, my mitigation analysis assumes that **all** elderberry plants growing at the project site will be within 100 feet from any project improvements and will be lost or otherwise affected.

In some instances, USFWS will allow work activities to occur as close as 20 feet from the dripline of elderberry plants, but this must be approved by USFWS after a review of descriptions of work procedures near the elderberries, access routes, laydown areas, equipment storage areas, and parking areas, plus the project's work schedule. General protective measures are discussed in the next section of this report. If the protective measures are followed and USFWS approves, the mitigation requirements for this project could be substantially reduced from the scenario presented in this report.

The elderberry inventory information is used to:

- a) identify the number of existing elderberries that will be transplanted to a secure mitigation site;
- b) calculate the numbers of replacement elderberry seedlings that need to be propagated and planted at the mitigation site;
- c) calculate the numbers of associated native trees and shrubs that need to be propagated and planted at the mitigation site; and
- d) calculate the amount of acreage that needs to be secured to mitigate for the loss of VELB habitat.

The following points from the USFWS's (1999) VELB conservation guidelines were considered in the mitigation analysis:

- a) each trunk with a basal diameter ≥ 1.0 inch that is directly or indirectly impacted should be transplanted;
- b) each stem with a basal diameter of 1.0 inch or greater that is impacted will be replaced with seedling elderberry plants using a minimal replacement ratio of 2:1 to 8:1, and this ratio depends upon the type of habitat, basal stem diameters of affected elderberries, the presence of VELB exit holes in the affected plants;
- c) representative native tree and shrub species that grow in association with the elderberries will be planted at a ratio of one or two specimens for every replacement elderberry seedling (1:1 or 2:1 ratios);
- d) 1800 square feet should be provided for every five replacement elderberry seedlings, five associated natives, and transplant; and
- e) a mitigation site, which will serve as habitat for the VELB in perpetuity, must be secured for the transplants and replacement plantings, and the size of the site is determined by the total planting square footage required for all replacement elderberries and associated natives.

Using this inventory information, Table 2 presents the anticipated mitigation requirements for potential impacts to elderberries. The number of replacement plants necessary to compensate for the anticipated loss of 6 stems ≥ 1 inch is 14 elderberries and 14 associated native plants. The 4 resident elderberry plants with basal stem diameters > 1 inch (#937 and #938 are treated as a single plant) must also be transplanted to the secure mitigation site. The required mitigation acreage for these replacement plants is 5,400 ft.² or approximately 0.124 acres.

Depending upon the location of and characteristics of the mitigation site, various associated native trees and shrubs would be appropriate to plant in conjunction with the replacement elderberries to restore the riparian habitat. For example, Box Elder, Valley Oak, Black Walnut, and California Rose, are some riparian tree and vine species that often grow in close association with the elderberry food plant of the VELB in the greater Ceres area.

In addition, the findings of the aforementioned analysis are converted to an equivalent number of VELB conservation credits. Since the project sponsors may decide to satisfy their mitigation requirements through the purchase of such credits from a conservation bank. This proposed project will require 3 VELB conservation credits.

Mitigation Plan.

Assuming that all elderberries at the project site will be impacted by the Ceres Marketplace project, two alternatives are available to the project sponsors to resolve their mitigation requirements, including:

- a) secure a mitigation site, protect it in perpetuity, revegetate it with the required

numbers of elderberries and associated natives, and monitor it annually for a minimum period of 10 years to demonstrate that the habitat restoration is successful;
or

- b) purchase VELB conservation credits at a USFWS-approved conservation bank whose service territory includes the project site.

The remainder of this section discusses each of these mitigation options in more detail.

Option #1 – Mitigation Site and Habitat Restoration: Under this option, the project sponsors would secure a mitigation site, protect it in perpetuity, revegetate it with the required numbers of elderberries and associated natives, and monitor it annually for a minimum period of 10 years to demonstrate that the habitat restoration effort is successful (i.e., at least 60 % survival of mitigation plantings at the end of 10 years). Specific features of this option for anticipated impacts to elderberries are detailed as follows:

- a) at least 14 elderberry seedlings will need to be propagated and planted at a secure mitigation site;
- b) at least 14 associated natives will need to be propagated and planted at a secure mitigation site;
- c) 4 elderberry plants with stems \geq 1 inch basal diameter that grow at the project site will be transplanted to a secure mitigation site; and
- d) the mitigation site will need to include a minimum of 0.124 acre to insure adequate planting space for all of the mitigation plants.

The USFWS (1999) VELB conservation guidelines discuss additional measures that should be followed, including acceptable planting design standards, success criteria, monitoring, other implementation activities, and reporting requirements. Depending upon the location and characteristics of the mitigation site, the USFWS may provide additional recommendations for the habitat restoration effort.

This option is likely to be the most expensive and lengthy of the two alternative mitigation solutions available to the project sponsors for the following reasons. First, a suitable mitigation site may need to be purchased if the sponsor does not currently own a site appropriate for restoration of VELB habitat. Because a suitable site, measuring exactly 0.124 acre, is unlikely to be available, the project sponsors may need to purchase a larger site to obtain the required acreage. Secondly, depending upon the condition of the mitigation site, the costs of site preparation, habitat restoration, and security may be considerable. Finally, annual monitoring and reporting to USFWS is required for a minimum of 10 years, or until all criteria for successful restoration are actually achieved.

Option #2 – Purchase VELB Conservation Credits: For anticipated impacts at the Ceres Marketplace project site, the project sponsor could purchase 3 VELB conservation credits (also referred to as “habitat units”) from a USFWS-approved conservation bank whose service territory includes the project site. The 3 conservation credits are determined by dividing the total number of required mitigation elderberries by 5 (i.e., 14/5), which yields 2.8. No additional credits are needed for the associated native plants. Since conservation banks generally do not sell partial VELB credits, this number was rounded up to 3 credits. Also, the 4 elderberries at the project site, whose basal stem diameters are > 1 inch, should also be transplanted to the conservation bank.

The service territory of at least one USFWS-approved conservation bank, River Ranch Conservation Bank, includes the Ceres Marketplace project site. This bank usually charges \$3,500 per VELB credit. Transplanting of impacted elderberries is usually an extra cost that will be estimated by the bank operator after visiting the project site. The USFWS (1999) VELB conservation guidelines provide information about the best time to transplant elderberries and recommended procedures for preparing the elderberries for transplant. These guidelines recommend transplanting the elderberries when they are dormant, usually between mid-November through mid-February. If transplanting occurs outside of this period, then the USFWS may impose higher mitigation ratios for elderberries and associated natives.

Advantages of this option are that the conservation bank assumes all responsibilities and liabilities for insuring that the required VELB mitigation is successful. Thus, once the project sponsor completes its purchase of the VELB credits, it will have fulfilled its mitigation obligation for the project.

PROTECTIVE MEASURES DURING AND AFTER CONSTRUCTION

If any elderberry plants remain at the Ceres Marketplace project site during grading and construction activities, the following protective measures are recommended by USFWS (1999).

- a) A buffer zone will be established around the perimeter of all elderberry plants that provide potential habitat for the VELB (i.e., \geq 1 inch basal stem diameter). Preferably, the buffer zone should be at least 100 ft. wide and cannot include firebreaks, access routes, equipment storage areas, parking areas, or laydown areas. The perimeter of the buffer zone should be fenced during grading and construction activities.
- b) All construction personnel will be briefed on the need to avoid damage to elderberries, as well as the penalties for non-compliance.
- c) Warning signs will be erected every 50 feet along the edge of the buffer perimeter. The signs should state: “This area is habitat for the Valley Elderberry Longhorn Beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to

prosecution, fines, and imprisonment.” The signs should be clearly readable from a distance of 20 feet, and must be maintained for the duration of construction.

- d) All construction personnel will receive training on the status of the VELB and the need to protect its elderberry food plant.

In some instances the USFWS may reduce the buffer width to 20 feet around the dripline of elderberries. Additional protective measures are required and must be approved by USFWS, but may include precautions such as:

- a) avoid the adult flight period of the VELB, which is generally between March 1st and June 30th;
- b) conduct earthwork and other dust generating activities during the dormant period of the elderberry, i.e., mid-November through mid-February;
- c) implement stringent measures for dust control;
- d) no use of insecticides or herbicides at the project site; and
- e) increased frequency of biological monitoring, for example once per week, to insure that the elderberries are adequately protected during the work.

USFWS may also request other protective measures after reviewing the project.

Indirect impacts to the elderberry plants, such as the accumulation of dust on foliage and flowers of the elderberry, can also adversely affect the VELB. Thus appropriate dust control measures should be followed throughout the grading and construction periods. Dust may also be generated by vehicular and equipment operation along temporary roads. Appropriate dust control measures include:

- a) sprinkle water on all active construction areas at least twice daily and more often when conditions warrant;
- b) cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least two feet of freeboard;
- c) pave, apply water three times daily, or apply non-toxic soil stabilizers on all unpaved access roads, parking, areas, and staging areas at construction sites;
- d) sweep streets daily if visible soil material is carried onto adjacent public streets;
- e) hydroseed or apply non-toxic soil stabilizers to inactive construction areas;
- f) enclose, cover, water twice daily, or apply non-toxic soil binders to exposed soil

stockpiles;

- g) limit traffic speed on unpaved roads to 5 mph;
- h) replant vegetation in disturbed areas as quickly as possible;
- i) suspend grading activities when winds exceed 25 mph or when visible dust clouds cannot be prevented from extending beyond active construction area; and
- j) limit the areas subject to excavation, grading, and other dust generating activities at any one time.

Similarly, appropriate erosion control measures should be implemented to prevent any damage to the elderberries. The particular erosion control measures that may be needed should be recommended by a soils engineer.

Finally, if any elderberry plants remain at these project sites after completion of these projects, they will need to be protected and monitored to insure that subsequent site maintenance or other activities do not adversely impact them. The USFWS (1999) VELB conservation guidelines discuss measures for restoration, maintenance, and protection of buffer areas in more detail. The requirements are generally similar to those for off-site mitigation areas. A written plan for the restoration, protection, and maintenance of buffer areas needs to be approved by USFWS.

OBTAINING THE INCIDENTAL TAKE PERMIT

The four elderberry plants at the Ceres Marketplace site are located within the historical and current geographic ranges of the VELB. For this reason, even if there is no obvious evidence of infestation by the VELB, the USFWS generally requires an incidental take permit to be acquired by a project proponent and mitigation to compensate for any potential impacts. Due to the apparent isolation of these elderberries and lack of evidence of infestation, the USFWS should be informally consulted to determine whether an incidental take permit will definitely be acquired.

When you speak with USFWS, you should also inquire about the programmatic take permit for projects with low effects for the VELB. Since there are only four elderberry plants growing at the Ceres Marketplace site, this project should qualify for inclusion in the programmatic take permit, however the programmatic permit's take limits may have been fulfilled by now. This would alleviate the need to obtain an individual incidental take permit.

Assuming that an incidental take permit is required and the programmatic permit is unavailable, the project proponent may apply for an individual permit under Section 10(a) of the FESA, if no other federal permits are required for the project, or under Section 7 of this regulation if other federal permits are needed. For example, endangered species permit are frequently "piggybacked" on wetlands permits issued by the U.S. Army Corps of Engineers.

In either case, mitigation generally includes on-site protection in perpetuity or off-site protection. Because of the degraded habitat conditions at the project site and apparent isolation from other nearby elderberries, protection of off-site habitat probably will have a greater conservation value for the VELB. However, the costs of site acquisition, protection, restoration, and monitoring are probably prohibitive for the few impacted plants. For this reason, I suggest purchasing VELB conservation credits as the most cost-effective and best conservation solution.

If an individual take permit is necessary, the proposed Ceres Marketplace project should qualify as a low-effect project. Thus a low-effect habitat conservation plan (HCP) should be prepared and reviewed by USFWS to obtain the incidental take permit. The HCP describes the impacts, the mitigation solution, and identifies the parties involved to complete the conservation measures. The review process generally takes about one year by USFWS.

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**Table 1. Elderberry Inventory for the Ceres Marketplace Project Site
March 1, 2007**

Plant Location ID Number	Stem Numbers ≥ 1" to ≤ 3" diameter	Stem Numbers > 3" to < 5" diameter	Stem Numbers ≥ 5" diameter	VELB Exit Hole	Number of Plants	Notes
# 936	-	-	1	-	1	
#937	1	-	2	-	1	Tagged as #937 and #938
# 939	-	1	-	-	1	
# 940	-	1	-	-	1	
Totals for impacted plants	1	2	3	0	4	

**Table 2. VELB Mitigation Requirements for the Ceres Marketplace Project
(all elderberries grow in non-riparian habitat)**

Stem Size Class	Number of Stems	VELB Exit Holes	Elderberry Seedling Ratio	Number of Mitigated Elderberries	Associated Natives Ratio	Number of Associated Natives
Number of Stems ≥ 1" to ≤ 3"	1	N	1:1	1	1:1	1
	0	Y	2:1	0	2:1	0
Number of Stems > 3" to < 5"	2	N	2:1	4	1:1	4
	0	Y	4:1	0	2:1	0
Number of Stems ≥ 5"	3	N	3:1	9	1:1	9
	0	Y	6:1	0	2:1	0
Totals	6	0 exit holes		14		14