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Endangered and Threatened Wildlife and Plants; Removal of the Valley Elderberry Longhorn Beetle From the Federal List of Endangered and Threatened Wildlife; Proposed Rule

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R8–ES–2011–0063; FXES11130900000C6–123–FF09E32000]

RIN 1018–AV29

Endangered and Threatened Wildlife and Plants; Removal of the Valley Elderberry Longhorn Beetle From the Federal List of Endangered and Threatened Wildlife

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule; 12-month petition finding.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), propose to remove the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) from the Federal List of Endangered and Threatened Wildlife. This action is based on a review of the best available scientific and commercial data, which indicates that the subspecies no longer meets the definition of endangered or threatened under the Endangered Species Act of 1973, as amended (Act). This proposed rule, if made final, would remove the valley elderberry longhorn beetle as a threatened species from the List of Endangered and Threatened Wildlife, and would remove the designation of critical habitat for the subspecies. This document also constitutes our 12-month finding on a petition to delist the valley elderberry longhorn beetle.

DATES: We will accept comments until December 3, 2012. We must receive requests for public hearings, in writing, at the address shown in **FOR FURTHER INFORMATION CONTACT** by November 16, 2012.

ADDRESSES: You may submit comments by one of the following methods:

(1) *Electronically:* Go to the Federal eRulemaking Portal: *http://www.regulations.gov.* In the Search field, enter FWS–R8–ES–2011–0063, which is the docket number for this rulemaking. On the search results page, under the Comment Period heading in the menu on the left side of your screen, check the box next to ''Open'' to locate this document. Please ensure you have found the correct document before submitting your comments. If your comments will fit in the provided comment box, please use this feature of *http://www.regulations.gov,* as it is most compatible with our comment review procedures. If you attach your comments as a separate document, our preferred file format is Microsoft Word. If you attach multiple comments (such as form letters), our preferred format is a spreadsheet in Microsoft Excel.

(2) *By hard copy:* Submit by U.S. mail or hand-delivery to: Public Comments Processing, Attn: FWS–R8–ES–2011–0063; Division of Policy and Directives Management; U.S. Fish and Wildlife Service; 4401 N. Fairfax Drive, MS 2042–PDM; Arlington, VA 22203.

We request that you send comments only by the methods described above. We will post all comments on *http://www.regulations.gov.* This generally means that we will post any personal information you provide us (see Public Comments below for more information).

FOR FURTHER INFORMATION CONTACT: Susan Moore, Field Supervisor, Sacramento Fish and Wildlife Office, 2800 Cottage Way, Suite W–2605, Sacramento, CA 95825; telephone 916–414–6600; facsimile 916–414–6712. If you use a telecommunications device for the deaf (TDD), call the Federal Information Relay Service (FIRS) at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Executive Summary

This document contains: (1) A 12-month finding in response to a petition to delist the valley elderberry longhorn beetle (beetle); and (2) a proposed rule to remove the valley elderberry longhorn beetle as a threatened species from the List of Endangered and Threatened Wildlife, and to remove the designation of critical habitat.

Species addressed. The valley elderberry longhorn beetle *(Desmocerus californicus dimorphus*), is found within the Central Valley of California. At listing, it was known from 10 occurrence records at 3 locations: Merced County, Sacramento County, and Yolo County. Currently, it is known from 201 occurrence records at 26 locations, including much of the San Joaquin and Sacramento Valleys from Shasta County in the northern Sacramento Valley to Kern County in the southern San Joaquin Valley. This subspecies is a wood borer that is dependent on its host plant, the elderberry (*Sambucus* species), which is a common shrub component of riparian forests and adjacent upland vegetation along river corridors of the Central Valley.

Purpose of the Regulatory Action. Under the Endangered Species Act of 1973, as amended (Act), we may be petitioned to list, delist, or reclassify a species. In 2010, we received a petition from the Pacific Legal Foundation requesting that the Service remove the valley elderberry longhorn beetle, which is currently listed as a threatened species under the Act, from the Federal List of Endangered and Threatened Wildlife. In 2011, we published our 90-day finding on the petition, which concluded that the petition contained substantial information that delisting the beetle may be warranted. Therefore, we also announced that we were initiating a status review for this subspecies as required under the Act. As the result of that status review, we find that delisting the valley elderberry longhorn beetle is warranted, and we propose to remove the beetle from the List of Endangered and Threatened Wildlife, and remove designated critical habitat.

Basis for the Regulatory Action. Under the Act, a species may be determined to be endangered or threatened based on any of five factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence.

We reviewed all available scientific and commercial information pertaining to the five threat factors in our status review of the valley elderberry longhorn beetle. The results of our status review are summarized below.

- While there are minimal surveys to comprehensively evaluate current presence or population trends over time, we believe the available data are sufficient to conclude that the beetle persists in several more locations that were not known at the time of listing under the Act, some of which are either restored or protected, or both. Records since listing show the beetle may currently occupy most of the 26 locations identified and continues to persist in these locations, as is expected for some period of time into the future.
- Notwithstanding data uncertainties and the absence of protections or enhancements at many locations, we believe sufficient habitat will remain within this range into the foreseeable future, and the subspecies no longer meets the definition of endangered or threatened under the Act. Varying levels of protections have been applied to 15 of the 23 locations discovered since listing (10 locations contain well-protected lands and portions of 5 other locations are managed for natural and open space values), and management is being applied to occupied and unoccupied sites within these locations

(including habitat restoration to increase the amount of suitable habitat for potential use by the beetle). Additionally, we believe the beetle will continue to persist based on: (1) The increase in number of beetle occurrence records; (2) increase in number of locations where the beetle is found, including over a larger range than what was known at the time of listing; (3) past and ongoing riparian vegetation restoration; and (4) persistence of elderberry shrubs in restored areas, as well as on a variety of public lands managed for natural values as open space.

Public Comments

We intend any final action resulting from this proposal to be based on the best scientific and commercial data available, and be as accurate and as effective as possible. Therefore, we request comments or information from other governmental agencies, tribes, the scientific community, industry, or other interested parties concerning this proposed rule. We particularly seek comments concerning:

(1) Location-specific information concerning the cause and extent of past, recent, and projected future losses of total riparian vegetation and elderberry shrubs within the 26 individual river or watershed systems (referred to hereafter as locations) considered in this document to be, or to have previously been, occupied by the beetle, including the north Central Valley (Sacramento River; Thomes, Stony, Big Chico, Butte, Putah, and Cache Creeks; Feather, Yuba, Bear, and lower American Rivers; and the upper American River vicinity and the Ulatis-Green Valley Creeks vicinity) and the south Central Valley (Cosumnes River and vicinity, including Laguna and Dry Creek; Mokelumne River and vicinity, including Bear River; the lower Stanislaus River; upper Stanislaus hills vicinity, including the foothill systems between and around New Melones and Don Pedro Reservoirs; the Calaveras, Tuolumne, Merced, Kings, Kaweah, Tule, Kern, and San Joaquin Rivers; and Caliente Creek).

(2) Location-specific information (including Geographic Information System (GIS) data or tabular geographic coordinate data) on the range, distribution, population size, or population trends of the valley elderberry longhorn beetle, with particular emphasis on data collected since, or not included in, our 2006 5-year review.

(3) Location-specific information on protections in each of the above-mentioned locations (river systems or watersheds) with emphasis on discerning the geographic locations and extent of protected and unprotected areas, including, but not limited to: vegetative allowances, vegetative maintenance, monitoring programs with adaptive management actions, conservation easements, public land ownership and associated permanent protections, and any other form of location-specific protection.

(4) Location-specific information regarding male specimen observation and subspecies identification, with particular interest in recently reported locations in the eastern portion of the range in foothill elevations.

(5) Location-specific information on future anticipated level of threat of additional habitat loss, and the source of such loss (such as agricultural and urban development, or flood control). Where threats are not yet elevated in the absence of formal protection, we seek information on rationales for why threats may or may not be elevated in the future. We also seek information on future reduction in threats of habitat loss, where appropriate.

(6) Information, including geographic coordinates of the locations, about any additional populations of the valley elderberry longhorn beetle in other locations not considered in this proposed rule, or regarding the loss of previously existing populations.

(7) Information on all other threats, such as from scientific study of the valley elderberry longhorn beetle, inferred from study of a similar species, or location-specific threats information, including potential impacts from predators such as the Argentine ant, effects of small population size, and pesticides.

(8) New information and data on the projected and reasonably likely impacts to valley elderberry longhorn beetle associated with climate change.

(9) Documentation of the effectiveness (or lack thereof) of current mitigation, habitat restoration, and other conservation measures, particularly those mentioned in Talley *et al.* 2006a, pp. 46–48, tables 2.3.1.1–2.3.1.2 (available at *http://www.regulations.gov* and *http://www.fws.gov/sacramento/es/documents/VELB_5yr_review_Talley_etal.pdf);* and, specifically, location-specific quantities of riparian vegetation (length, area, and proportion of the overall location conserved or restored), beetle habitat (elderberry shrubs) in particular, and occupancy of that habitat by the subspecies.

(10) Information on the spatial extent of occupation within locations at which the beetle has been observed in relation to habitat and threats within these areas.

(11) Location-specific information on the present quantity of riparian vegetation, elderberry within riparian vegetation, and elderberry within the watershed or vicinity, but not associated with riparian vegetation.

(12) Information regarding how best to conduct post-delisting monitoring, should the proposed delisting lead to a final delisting rule (see Post-Delisting Monitoring Plan Overview section below, which briefly outlines the goals of the draft plan that is available for public comment concurrent with publication of this proposed rule). Such information might include suggestions regarding the draft objectives, monitoring procedures for establishing population and habitat baselines, or for detecting variations from those baselines over the course of at least 10 years.

You may submit your comments and materials concerning this proposed rule (and associated draft post-delisting monitoring (PDM) plan) by one of the methods listed in **ADDRESSES**. We will not accept comments sent by email or fax or to an address not listed in **ADDRESSES**. If you submit a comment via *http://www.regulations.gov,* we will post your entire comment—including your personal identifying information—on *http://www.regulations.gov.* If your written comments provide personal identifying information, you may request at the top of your document that we withhold this information from public review. However, we cannot guarantee that we will be able to do so. We will post all hardcopy comments on *http://www.regulations.gov.* Please include sufficient information with your comment to allow us to verify any scientific or commercial data you submit.

Comments and materials we receive, as well as supporting documentation we used in preparing this proposed rule, will be available for public inspection on *http://www.regulations.gov,* or by appointment, during normal business hours, at the U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**).

Public Hearings

Section 4(b)(5) of the Act provides for one or more public hearings on this proposal, if requested. We must receive your request within 45 days after the date of this **Federal Register** publication. Send your request to the address shown in **FOR FURTHER INFORMATION CONTACT**. We will schedule public hearings on this proposal, if any are requested, and announce the dates, times, and places of those hearings, as

well as how to obtain reasonable accommodations, in the **Federal Register** and local newspapers at least 15 days before the hearing.

Peer Review

In accordance with our joint policy on peer review published in the **Federal Register** on July 1, 1994 (50 FR 34270), we will seek the expert opinions of at least three appropriate and independent specialists regarding this proposed rule and the draft PDM plan. The purpose of peer review is to ensure that decisions are based on scientifically sound data, assumptions, and analyses. A peer review panel will conduct an assessment of the proposed rule and draft PDM plan, and the specific assumptions and conclusions regarding the proposed delisting. This assessment will be completed during the public comment period.

We will consider all comments and information we receive during the comment period on this proposed rule as we prepare the final determination. Accordingly, the final decision may differ from this proposal.

Background

Previous Federal Actions

The valley elderberry longhorn beetle was proposed as a threatened species with critical habitat on August 10, 1978 (43 FR 35636). A rule re-proposing critical habitat was issued on May 2, 1980 (45 FR 29373), to comply with amendments made to the Act. A final rule listing the beetle as threatened and designating critical habitat was published in the **Federal Register** on August 8, 1980 (45 FR 52803). A final Recovery Plan was approved for the beetle on June 28, 1984 (Service 1984, pp. 1–62). On July 7, 2005, we announced in the **Federal Register** that we were initiating 5-year reviews for 31 listed species, including the beetle (70 FR 39327). Information from the public was accepted until September 6, 2005. On November 3, 2005, we announced in the **Federal Register** an extension of the period for submitting information to be considered in the 5-year review to January 3, 2006 (70 FR 66842). The Service completed a 5-year review on September 26, 2006, that recommended the Service delist the valley elderberry longhorn beetle. The 5-year review is available to the public on the Internet at *http://www.fws.gov/cno/es/VELB%205-year%20review.FINAL.pdf.*

Petition History

On September 13, 2010, we received a petition dated September 9, 2010, from the Pacific Legal Foundation, as representative for Reclamation District Number 108, *et al.,* requesting that the valley elderberry longhorn beetle be removed from the Federal List of Endangered and Threatened Wildlife under the Act. The petition clearly identified itself as such, and included the requisite identification information for the petitioners, as required by 50 CFR 424.14(a). The petition included the Service's 5-year review as supporting information (Service 2006a). On August 19, 2011, we published a 90-day finding in response to the Pacific Legal Foundation's petition stating that the petition presented substantial scientific or commercial information indicating that delisting the valley elderberry longhorn beetle may be warranted (76 FR 51929). This proposed rule also constitutes our 12-month finding for the petition to delist the valley elderberry longhorn beetle. As the result of our status review, we find that delisting the valley elderberry longhorn beetle is warranted, and we propose to remove the beetle from the List of Endangered and Threatened Wildlife, and remove designated critical habitat.

Species Information

Description and Basic Biology

The valley elderberry longhorn beetle (beetle) (*Desmocerus californicus dimorphus*) is a medium-sized red and dark green (to red and black) insect approximately 0.8 inch (in) (2 centimeters (cm)) long. It is endemic to the Central Valley of California (Fisher 1921, p. 207; Doane *et al.* 1936, p. 178; Linsley and Chemsak 1972, p. 7). The similar-looking California elderberry longhorn beetle (*Desmocerus californicus californicus*) is primarily known from coastal regions of California (Collinge *et al.* 2001, p. 104). The two subspecies can be identified with certainty only by adult male coloration, where males of the listed subspecies have predominantly red elytra with four dark spots, whereas males of the common, unlisted subspecies (California elderberry longhorn beetle) have dark metallic green to black elytra with a red border. The ranges of the two subspecies may abut or overlap along the foothills of the eastern Coast Range and the southern San Joaquin Valley; dark males have also been noted in Placer and Yolo Counties (Talley *et al.* 2006a, pp. 5–6). Beetles meeting the description of the California elderberry longhorn beetle have also been recorded in the Sierra Nevada foothills as far north as Mariposa County (Halstead and Oldham 2000, pp. 74–75), suggesting that the ranges of the two subspecies may also abut or overlap in that area.

The valley elderberry longhorn beetle is a wood borer, dependent on (and found only in association with) its host plant, the elderberry (*Sambucus* spp. of the Caprifoliaceae [honeysuckle] family) (Barr 1991, p. 4; Collinge *et al.* 2001, p. 104). The elderberry is a common shrub component of riparian forests and adjacent upland vegetation along river corridors of the Central Valley (Hickman 1993, pp. 474–475; Sawyer and Keeler-Wolf 1995, pp. 171, 229; Halstead and Oldham 2000, p. 74). Adult beetles feed on elderberry nectar, flowers, and foliage, and are generally active from March through June (Eng 1984, p. 916; Barr 1991, p. 4; Collinge *et al.* 2001, p. 105). They are uncommon (see ''Occurrence Information and Population Size and Distribution'' below) and rarely observed, despite their relatively large size and conspicuous coloration.

The females lay eggs, singly or in small groups, on the leaves or stems of living elderberry shrubs (Barr 1991, p. 4). The larvae hatch in a few days, and bore into living stems that are at least 1 in. (2.5 cm) in diameter. The larvae remain within the elderberry stem, feeding on the pith (dead woody material) until they complete their development. Each larva creates its own gallery (set of tunnels) within the stem by feeding (Talley *et al.* 2006a, pp. 8–9). The larva eventually cuts an exit hole out of the stem, but plugs the hole up again from within using wood shavings. This allows the beetle to eventually exit the stem after it becomes an adult, as the adults are not wood borers. The larva remains within the stem, becomes a pupa, and finally emerges from its single exit hole as an adult between mid-March and mid-June (Lang *et al.* 1989, p. 242; Barr 1991, p. 5; Talley *et al.* 2006a, p. 9). There is thus one exit hole per larva. The complete life cycle is thought to take either 1 or 2 years (depending on the amount of time the larva stays in the elderberry stem), with adults always emerging in the spring. Adults live from a few days to a few weeks after emerging, during which time they mate and lay their eggs (Talley *et al.* 2006a, p. 7). Shrub characteristics and other environmental factors appear to have an influence on use by the valley elderberry longhorn beetle in some recent studies, with more exit holes in shrubs in riparian, than nonriparian, scrub habitat types (Talley *et. al.* 2006a, p. 18), and increased beetle colonization of larger shrubs (and greater beetle extinction from smaller shrubs) (Zisook 2007, p. 1).

Lost Historical Range

Although there are insufficient valley elderberry longhorn beetle records to directly assess changes in distribution from historical times to the present, it is probable that beetle habitat distribution was coarsely related to the extent of riparian forests of which the host plant, elderberry, is often a component. However, we note that elderberry does not occur in all areas where riparian vegetation exists. Thus, we are unable to provide an accurate assessment of potential lost historical range of valley elderberry longhorn beetle habitat; rather, estimates are based on historical losses of riparian vegetation.

Historically, California's Central Valley riparian forests have experienced extensive vegetation loss during the last 150 years due to expansive agricultural and urban development (Katibah 1984, p. 23). These Central Valley riparian forests include those along the Sacramento and San Joaquin Valleys that comprise the north and south range, respectively, of the valley elderberry longhorn beetle, as discussed in detail below in ''Occurrence Information and Population Size and Distribution.'' Since colonization, these forests have been ''* * * modified with a rapidity and completeness matched in few parts of the United States'' (Thompson 1961, p. 294). As of 1849, the rivers and larger streams of the Central Valley were largely undisturbed (Thompson 1961, p. 305), supporting continuous bands of riparian woodland 4 to 5 mi (6.4 to 8 km) wide along some major drainages such as the lower Sacramento River, and generally about 2 mi (3.2 km) wide along the lesser streams (Thompson 1961, p. 307). Most of the riverine floodplains supported riparian vegetation to about the 100-year flood line (Katibah 1984, p. 25). A large human population influx occurred after 1849; however, much of the Central Valley riparian vegetation was rapidly converted to agriculture and used as a source of wood for fuel and construction to serve a wide area (Thompson 1961, p. 311). 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, p. 312).

Based on the historical riparian woodlands information summarized in the paragraph above, we conservatively estimate that over 90 percent of that riparian vegetation in the Central Valley has been converted to agriculture or urban development since the middle of the 1800s (Thompson 1961, pp. 310–311; Katibah *et al.* 1984, p. 314). We also note that estimates of historical riparian vegetation loss in the Central Valley and acreage of current riparian vegetation vary. Based on a California Department of Fish and Game (CDFG) riparian vegetation distribution map, about 102,000 ac (41,278 ha) out of an estimated 922,000 ac (373,120 ha) of Central Valley riparian forest remained at the turn of the century (Katibah 1984, p. 28). This represents a decline in acreage of approximately 89 percent as of 1979 (Katibah 1984, p. 28). Another source indicates that 132,586 ac (53,656 ha) of riparian vegetation remained across the Central Valley in 2003 (Geographic Information Center 2003, p. 14), which represents a 50 percent decline since 1960. More extreme figures are provided by Frayer *et al.* (1989, pp. ii), who reported that approximately 85 percent of all wetland acreage in the Central Valley was lost before 1939; and that from 1939 to the mid-1980s, the acreage of wetlands dominated by forests and other woody vegetation declined from 65,400 ac (26,466 ha) to 34,600 ac (14,002 ha). Differences in methodology may explain the differences between these estimates. In any case, the historical loss of riparian vegetation in the Central Valley strongly suggests that the range of the valley elderberry longhorn beetle has been reduced (because elderberry is a component of riparian vegetation), and its distribution has been fragmented.

For the purposes of this analysis, we are utilizing what we believe is a reliable estimate for remaining riparian vegetation within the Central Valley (i.e., 132,586 ac (53,656 ha) as reported by Geographic Information Center (2003)); this value will be used as a reference point when discussing impacts to remaining riparian vegetation in this document. The causes of this lost historical riparian vegetation are described in the following paragraphs as background information for this discussion on valley elderberry longhorn beetle's lost historical range. Causes of ongoing and future loss of riparian vegetation within the range of the beetle are discussed below in Summary of Factors Affecting the Species.

The historical clearing of riparian forests for fuel and construction in the Central Valley made this land available for agriculture (Thompson 1961, p. 313). Natural levees bordering the rivers, which once supported vast tracts of riparian vegetation, became prime agricultural land (Thompson 1961, p. 313). 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 have further reduced riparian vegetation to small, isolated fragments (Katibah 1984, p. 28). In recent decades, these riparian areas in the Central Valley have continued to decline as a result of ongoing agricultural conversion, urban development, and stream channelization. As of 1989, there were more than 100 dams within the Central Valley drainage basin, as well as thousands of miles of water delivery canals and stream bank flood control projects for irrigation, municipal and industrial water supplies, hydroelectric power, flood control, navigation, and recreation (Frayer *et al.* 1989, p. 5). Riparian forests in the Central Valley have dwindled to discontinuous strips of widths measurable in yards rather than miles.

Between 1980 and 1995, the human population in the Central Valley grew by 50 percent, while the rest of California grew by 37 percent (American Farmland Trust 2011). The Central Valley's population was 4.7 million in 1999, and it is expected to more than double by 2040 (American Farmland Trust 2011). The American Farmland Trust estimates that by 2040, more than one million cultivated acres will be lost and 2.5 million more put at risk (American Farmland Trust 2011). With this growing population in the Central Valley, increased development pressure could affect native vegetation communities.

A number of studies have focused on riparian vegetation loss along the Sacramento River, which supports some of the densest known populations of the beetle. Approximately 98 percent of the middle Sacramento River's historical riparian vegetation was believed to have been extirpated by 1977 (DWR 1979, entire). The State Department of Water Resources estimated that native riparian vegetation along the Sacramento River from Redding to Colusa decreased 34 percent from 27,720 ac (11,218 ha) to 18,360 ac (7,430 ha) between 1952 and 1972 (Conard *et al.* 1977, p. 47). The average rate of riparian loss on the middle Sacramento River was 430 ac (174 ha) per year from 1952 to 1972, and 410 ac (166 ha) per year from 1972 to 1977 (Conard *et al.* 1977, p. 47).

There is no comparable information on the historical loss of beetle habitat (i.e., the component of riparian vegetation that contains elderberry, which includes elderberry savanna and other vegetation communities where elderberry occurs, such as oak or mix-chaparral woodland, or grasslands adjacent to riparian vegetation). However, all natural habitats throughout the Central Valley have been heavily impacted within the last 200 years (Thompson 1961, pp. 294–295), and it can, therefore, be concluded that beetle habitat also has declined. Accordingly, loss of beetle habitat (also described in literature as nonriparian vegetation where elderberry occurs), and of specific areas where the beetle has been recorded (Barr 1991, entire), further suggests reduction of the beetle's range and increased fragmentation of its upland habitat.

We cannot conclude that the losses of riparian and aquatic vegetation described in this section are representative of the lost historical habitat for the valley elderberry longhorn beetle, because we have no way of knowing which of these lost areas were actually historically occupied by the beetle.

Occurrence Information and Distribution

Historically and currently, the valley elderberry longhorn beetle is rarely observed (although we expect infrequent observations because there is infrequent survey data). For example, survey efforts conducted by Barr (1991, pp. 45–46), Collinge *et al.* (2001, p. 107), and Talley *et al.* (2006a, p. 11) have documented very few adult valley elderberry longhorn beetles. Consequently, the past and current presence of beetles in a given area is usually established based on the presence of recent or old exit holes in elderberry stems (Jones & Stokes 1987, p. 2; Barr 1991, p. 12). Recent exit holes (made within the current year) are typically distinguishable from holes made in previous years by the presence of wood shavings and light-colored wood within the hole. Thus, trained surveyors are generally able to distinguish current beetle presence from presence of the beetle in previous years (Collinge *et al.* 2001, p. 105). Trained surveyors are also typically able to distinguish between exit holes made by the beetle and exit holes made by other species of wood borers (Talley *et al.* 2006a, pp. 9–10; River Partners 2007, p. 7). However, exit holes made by the valley elderberry longhorn beetle are not distinguishable from exit holes made by the California elderberry longhorn beetle, except by inference, based on where the observation occurred within the range of either beetle (River Partners 2007, p. 9).

When the valley elderberry longhorn beetle was listed in 1980, it was known from 10 occurrence records at three locations: the Merced River (Merced County), the American River (Sacramento County), and Putah Creek (Yolo County) (45 FR 52805, August 8, 1980; Service 2006a, p. 5; Talley *et al.* 2006a, p. 23). Subsequent survey efforts have expanded our knowledge of the beetle's range to include much of the San Joaquin and Sacramento Valleys, from Shasta County in the northern Sacramento Valley to Kern County in the southern San Joaquin Valley, California. Currently, 201 beetle occurrence records are identified in the California Natural Diversity Database (CNDDB), in addition to some other records not yet reported to CNDDB (CNDDB 2010, pp. 1–202; Table 1). The CNDDB is an electronic inventory of observation records for California's rare plants, animals, and communities, managed by CDFG (CDFG 2009, p. 1).

In Table 1, we present information for 201 occurrence records representing 26 locations that we believe represent the best available data regarding the distribution of this subspecies. These selected records include all of the major riparian systems within the Central Valley proper and a few foothill systems immediately above major reservoirs. We do not include 12 occurrence records from other riparian systems (i.e., they are not included in Table 1 nor are they discussed further in this rule), because we do not regard them as verified for various reasons, including that they: Are isolated records that contain extremely limited habitat; occur exclusively at higher elevations adjacent to the range of the California elderberry longhorn beetle (Oakhurst vicinity, Auberry vicinity, North Fork Willow Creek, Mariposa Creek, Los Banos Creek, Lawrence Livermore National Laboratory, North Fork Feather River); are extirpated (Middle River); represent a single shrub in rural development (Dixon); contain records from dead wood or old exit holes only (Honcutt Creek, Paynes Creek); or occur in a location within heavily maintained channels (Chowchilla). Additionally, there are also locations (Deer Creek, Battle Creek) that are represented by a single non-CNDDB report, and are not discussed.

TABLE 1—LOCATIONS AND OCCURRENCE RECORDS OF THE VALLEY ELDERBERRY LONGHORN BEETLE IN THE NORTH AND SOUTH CENTRAL VALLEY OF CALIFORNIA [1]

Locations (north to south) [2]	Number of occurrence records [3]	Years of occurrences [4]
1.a. Sacramento River (SR), Redding-Red Bluff	10	87, 89, 91, 03A, 08A.
1.b. SR, Red Bluff-Chico	13(3)	85, 86, 87, 91, (00A), 01A, (03), (10).
1.c. SR, Chico-Colusa	18(1)	86, 87, 88, (03), 06.
1.d. SR, Colusa-American River confluence	7	85A.
1.e. SR, American River confluence south	2(1)	05A, 06A, (08).
2. Thomes Creek	1	91, absent 97.
3. Stony Creek	1	91, absent 97.
4. Big Chico Creek	2(1)	91, 97, (10).
5. Feather River	6(1)	85, 91, (07), 10A.
6. Butte Creek	4	93, absent 91, 95, absent 97.
7. Yuba River	7	98.
8. Bear River	4(2)	91, 98, 03, (04A, 10A).
9. Lower American River	11(4)	84A, 85A, 90A, 95A, 96, 00, 08A, (02, 03, 04,10).
10. Upper American River vicinity (Miner and Secret Ravine, Coon, Anderson and Linda Creeks) (foothill location >1,000 ft elevation).	8	84, 91, 02, 10.
11. Putah Creek	4(2)	82A, 91A, 95, 00A, (04, 10).
12. Cache Creek	7	91, 01A, 07A.

TABLE 1—LOCATIONS AND OCCURRENCE RECORDS OF THE VALLEY ELDERBERRY LONGHORN BEETLE IN THE NORTH AND SOUTH CENTRAL VALLEY OF CALIFORNIA [1]—Continued

Locations (north to south) [2]	Number of occurrence records [3]	Years of occurrences [4]
13. Ulatis-Green Valley Creeks	6	91, 02, 04, (08).
14. Cosumnes-Laguna-Dry Creeks	7(3)	64A, 84, 87, 91, (02, 03, 04).
15. Mokelumne-Bear Rivers	6	84, 91A, 06.
16. Stanislaus River	4(1)	84A, 85, 89, 91, (10).
17. Upper Stanislaus hills (vicinity above and between New Melones and Don Pedro Reservoirs, including Sullivan Creek) (foothill location >1,000 ft elevation).	6	99, 00, 02A, 07A.
18. Calaveras River-Stockton Diverting Canal	5	84A, 91, 00.
19. Tuolumne River	4	84, 91, 99.
20. Merced River	3(1)	85, 86, 90A, absent 91, (10).
21. Kings River	18	89A, 90A, 91, 94, 98A, absent 10.
22. Kaweah River	5	37, 86A, 91, 94.
23. Tule River-Deer Creek	5(1)	91A, 93, (10).
24. Kern River (excluding Caliente Creek)	1(2)	91, (08, 10).
25. Caliente Creek (foothill location >1,000 ft elevation)	3	91.
26. San Joaquin River	3(1)	84, 89, 92, 04

[1] Non-CNDDB source information includes survey from review of a section 7 consultation, literature sources such as Holyoak and Graves 2010, River Partners 2007, Collinge *et al.* 2001, and Talley 2005, and other verified sources (such as information from scientific experts or Service biologists who have evaluated data for accuracy) compiled in a GIS database by the Service's Sacramento Fish and Wildlife Office.

[2] The locations presented in this table are based on available data that provide detailed information about valley elderberry longhorn beetle presence. Additional locations were not included in this table due to a lack of sufficient information that provides certainty on valley elderberry longhorn beetle presence (see preceding text for explanation).

[3] Occurrence records are a combination of CNDDB source data and non-CNDDB source data, the latter of which is presented as a value between parentheses. For example, the Big Chico Creek location has a total of three occurrence records, including two from CNDDB source data and one from non-CNDDB source data.

[4] Data provided in this column show: (1) Years when surveys were conducted and beetles were found (e.g., ''99'' indicates that beetle evidence was observed in the year 1999, or ''90A'' indicates adult beetles were observed in 1990), and (2) years when surveys were conducted and beetles or evidence of beetles were not found (e.g., ''absent 91'' indicates that a survey was conducted in 1991 but no beetles or evidence of beetles were observed). Additionally, there could be existing known locations, or new locations (in addition to the 26 locations listed in this table) where valley elderberry longhorn beetles occur today, but it is uncertain because we know of no recent surveys that have been conducted.

An occurrence (or ''element occurrence'') is a term used in the CNDDB to refer to an observation at a location where a species has been documented to occur, such as a sighting of a valley elderberry longhorn beetle, or of an exit hole (recent or otherwise), that indicates possible presence of the subspecies. CNDDB data do not represent the results of a systematic survey, but rather reflect a compilation of observations from multiple contributors and studies over time. Depending on information provided by contributors, many beetle occurrence records are merely points on the map, whereas others include information regarding the size of the occupied area. Beetle occurrences are distributed across the Central Valley, generally occurring singly and in small, relatively isolated clusters along river corridors. Noticeably larger clusters of beetle records occur along the northern portions of the Sacramento River (around Tehama, Glenn, and Butte Counties), along the lower American River (primarily in Sacramento County), and along the Kings River (in Fresno County). One hundred and twenty-five beetle occurrences have been recorded in the northern portion of the Central Valley (north of the line formed by the southern boundaries of Sacramento and Amador Counties), as compared with 76 south of that line. CNDDB presumes all 201 occurrences in the Central Valley are currently extant (CDFG 2007, p. 4). Based on this information, we understand these occurrences to be currently extant.

This rule uses the term ''occurrence'' to refer to the valley elderberry longhorn beetle observations reported in CNDDB records. We use the terms ''site'' and ''survey site'' to refer to a specific local area that is surveyed for evidence of beetle presence (Barr 1991, pp. 9, 19; Collinge *et al.* 2001, p. 105). We use the term ''location'' to refer to the river system, major river reach, or watershed vicinity in which several records in general proximity to one another may occur.

The number and area of occurrences do not necessarily indicate the number and size of interbreeding populations (defined as groups of interbreeding valley elderberry longhorn beetles). This is because CNDDB generally groups sightings of beetles or exit holes within 0.25 mi (0.4 km) of each other into the same occurrence (CDFG 2009, pp. 2–3). In addition, while beetle movement is restricted, dispersal is believed to occur over a scale of around 12 mi (20 km), and metapopulations (a set of partially isolated subpopulations between which dispersal is limited) form at a scale of 25 mi (40 km) or less, within which there can be many occurrences (Collinge *et al.,* 2001, p. 108; Talley *et al.* 2006a, pp. 10–11). Beetles may, or may not, persist in any given elderberry shrub within an occurrence, or may inhabit more or fewer elderberry shrubs over time, but there is rarely documentation of these temporal changes to an occurrence. Although CNDDB presumes all occurrences in the Central Valley are extant, CNDDB generally does not identify an occurrence as extirpated, or possibly extirpated, unless it receives positive information (such as complete loss of habitat) to indicate the population is no longer at the site (CDFG 2007, p. 4). Occurrence records are thus primarily useful for demonstrating the extent of a species' range, and the general distribution within that range, as well as for noting information such as the date the species was last seen at a given location.

The infrequency of sampling data, and particularly the lack of recent sampling, makes it difficult to precisely determine population size and distribution of this subspecies. Dates last seen range from 1937 to 2008, with the vast majority occurring in the late 1980s and early 1990s (Service 2007, p. 11). For most of these sites, the date the subspecies was last seen and the date

the site was last visited are the same, possibly because of the infrequency with which sites are resurveyed. Only 26 of the CNDDB occurrence records are from 2000 or later. Regardless, data collected have shown a larger distributional range and a greater number of known occurrences when compared to the time of listing. We considered all information in the CNDDB and other sources not yet reported to the CNDDB to evaluate the subspecies' range and occurrences.

Although the majority of valley elderberry longhorn beetle occurrence records are those recorded in CNDDB, other occurrence records (not necessarily reported to the CNDDB) originate from projects reviewed under section 7 or section 10 of the Act, monitoring of elderberry plantings, and a few location-specific surveys (see below, this section). There are not a large number of records from any of these other sources. The most extensive of these other records are from National Wildlife Refuge (NWR) units along the Sacramento River north of Colusa. For example, in 2003, while monitoring elderberry shrubs planted at five Sacramento River NWR units, surveyors found 449 beetle exit holes in 299 (3.8 percent) of the 7,793 shrubs surveyed (River Partners 2004a, pp. 2–3; Talley *et al.* 2006a, p. 51), which were represented across all 5 refuge units surveyed. A greater percentage of beetle exit holes were found at sites with older elderberry plantings or near existing riparian vegetation (River Partners 2004a, pp. 4–5). Another example of beetle information beyond CNDDB records includes section 7 consultations. A total of 500 section 7 consultations dating since 2000 have been conducted because project sites contained riparian vegetation that may support the beetle (and potentially beetle habitat); 13 were reported to contain exit holes. Only 1 of these 13 observations was in the south Central Valley (Kern River). Outside of CNDDB, adult beetles have been observed six times at monitoring, restoration, or mitigation sites in the north Central Valley (Feather, Bear, and Sacramento River areas).

Within the range of the valley elderberry longhorn beetle, local beetle populations tend to be sporadic, small, and clustered, independent of the availability of larger areas of mature elderberry. For example, a study conducted in 1985–1987 focused on areas of native riparian vegetation along 183 mi (295 km) of the Sacramento River floodplain north of Sacramento. Researchers found that 95 percent of surveyed sites contained elderberries, while exit holes (old and recent) occurred in 64 percent of surveyed sites (Lang *et al.* 1989, pp. 243, 246). Lang *et al.* (1989, pp. 243–245) also found that habitat occupancy was substantially higher at the northern end of the study area, which is consistent with the pattern of distribution in the occurrence records. In the 48 river miles north of Chico Landing, 94 percent of study sites were occupied, while occupancy declined to 28 percent for the 85-mi (137-km) reach between Colusa and Sacramento. The authors noted that this pattern reflected the fact that riparian vegetation below Colusa was confined by levees to narrow strips, whereas between Colusa and Chico Landing setback levees allowed wider areas of riparian vegetation, and above Chico Landing habitat was unconstrained by levees.

Barr (1991) conducted an extensive study of riparian vegetation in 1991 along major rivers and streams in both the Sacramento and San Joaquin Valleys, and the adjacent foothills. Barr (1991, pp. 15, 42) found evidence of valley elderberry longhorn beetle occupancy (recent and old exit holes) in 28 percent of surveyed sites (64 of 230 sites), and in about 20 percent of the 504 groups of elderberry shrubs examined at those sites (each site had one to several shrub groups). The author noted general observations (such as rarity of the beetle and clustered nature of occurrences (Barr 1991, p. 49)), and specific results that include recent exit holes occurring at only 14 percent of sites surveyed (33 of 230 sites). In 1997, Collinge *et al.* (2001, p. 105) resurveyed 65 of the 79 sites that Barr (1991) had surveyed (25 of which showed evidence of occupancy) in the Sacramento Valley portion of the 1991 study. Collinge *et al.* (2001, p. 105) found that 20 percent of surveyed sites (13 of 65 sites) had recent exit holes, while 46 percent (30 of 65 sites) had either recent or old holes (Collinge *et al.* 2001, p. 107). The repetition of the earlier study further supported the relatively rare and clustered nature of beetle presence. Because the two surveys were completed using the same methods, the study also allowed a limited assessment of temporal changes in beetle presence or absence (Collinge *et al.* 2001, p. 105), which is further discussed below under the ''Population Status and Trends'' section.

Evaluating available data on old and recent valley elderberry longhorn beetle exit holes to aid in the determination of current occupancy of locations and current distribution across the subspecies' range has proven difficult. For example, in the San Joaquin Valley surveyors for two recent studies along the Stanislaus and San Joaquin Rivers found relatively recent beetle exit holes at six sites (Kucera *et al.* 2006, pp. 7–10, 12; River Partners 2007, pp. 9–11). Unfortunately, the two studies did not define ''recent'' the same way. One study (River Partners 2007, p. 8) included ''old'' recent holes with worn margins, while the other (Kucera *et al.* 2006, p. 4) followed the sampling methodology of Talley (2005, p. 14), which identifies ''recent'' holes as having crisp margins and minimal evidence of healing.

Beetle occupancy appears to be lower in the south Central Valley as compared to the north Central Valley. In the south Central Valley, Kucera *et al.* (2006, pp. 4–9) surveyed approximately 153 mi (246 km) of the San Joaquin River from Friant Dam to the confluence with the Merced River, and found 1 shrub with 6 recent exit holes and 16 shrubs with a total of 122 nonrecent holes. The recent holes, and all but three of the nonrecent holes, were located within 22 mi (35 km) of Friant dam (Kucera *et al.* 2006, pp. 8–9). Also in the south Central Valley, River Partners (2007, p. 1) surveyed 59 mi (95 km) of the Stanislaus River from Goodwin Dam to the confluence with the San Joaquin River, as well as 12 mi (19 km) of the San Joaquin River from the confluence with the Stanislaus River up to the confluence with the Tuolumne River. River Partners (2007, pp. 10, 26, 28, 38, 40, 42, 49) found one site with recent exit holes, four sites with both recent and nonrecent holes, and one site with nonrecent holes. However, two of the five sites with recent exit holes were high enough in elevation in the Sierra foothills that the surveyors considered it possible that the exit holes had been made by either valley elderberry longhorn beetles or California elderberry longhorn beetles (River Partners 2007, pp. 9, 26, 28). Numbers of recent exit holes at each site in the two studies ranged from 0 to 6 (Kucera *et al.* 2006, pp. 4, 8, 9) and 0 to 44 (River Partners 2007, pp. 10, 26, 28, 38, 40–43), showing the difficulty of comparing results across nonstandardized surveys.

In summary, multiple factors limit our ability to draw direct comparisons between all studies and over time, but, taken together, these studies consistently indicate a patchy distribution of the valley elderberry longhorn beetle throughout its range. As discussed above, the earliest study (Lang *et al.* 1989, pp. 242, 246) did not distinguish between old and new exit holes in determining that a site was actively occupied by beetles, while most of the later studies relied on the

presence of recent holes in determining occupancy of extant populations (Barr 1991, pp. 46, 47; Collinge *et al.* 2001, p. 107; Kucera *et al.* 2006, pp. 7–11; River Partners 2007, pp. 8, 11, 16). Additionally, survey timing varied between studies and often overlapped the beetle's emergence period. Despite these differences in survey methodology, species experts have determined that the beetle is patchily distributed throughout its range, even where suitable habitat is present (Barr 1991, p. 49; Collinge *et al.* 2001, p. 107; River Partners 2007, p. 23). The beetle occurs in clusters (Barr 1991, p. 49), with small populations everywhere that it occurs (Collinge *et al.* 2001, p. 107). Most occupied sites are located in the northern portion of the range along the Sacramento River (Collinge *et al.* 2001, p. 111). Site occupancy by the beetle appears to be higher in the northern Central Valley and lower in the south Central Valley (Kucera *et al.* 2006, pp. ii, 10). The reasons for patchy beetle distribution patterns and the low occupancy in the south Central Valley generally remain unclear, but appear to go beyond what may be explained by the simple presence or absence of elderberry shrubs. Thus, population characteristics such as patchy distribution and low occupancy in the south Central Valley, coupled with the infrequency of sampling data and, particularly, the lack of recent sampling, make it difficult to precisely determine population size and distribution of this subspecies.

Population Status and Trends

There are no long-term population data available for the valley elderberry longhorn beetle; rather, the only available data are the CNDDB occurrence records and limited records from other sources (Table 1). The Collinge *et al.* (2001) study attempted to provide information relevant to population trends by surveying and comparing the same sites within the Sacramento Valley as had been surveyed 6 years earlier by Barr (1991), using the same survey methods. They found fewer occupied groups of elderberry shrubs at each site (on average) because the average density of elderberry shrubs had decreased (Collinge *et al.* 2001, pp. 108, 109; Talley *et al.* 2006a, p. 13). The authors did not offer reasons for the observed decrease of elderberry bush density.

For comparisons regarding valley elderberry longhorn beetle site occupancy, Collinge *et al.* (2001, pp. 106–107) identified four types of changes evident from comparison of the 1991 and 1997 surveys: short-term extinctions (recent exit holes in 1991, no recent exit holes in 1997), short-term colonizations (no recent holes in 1991, recent holes in 1997), long-term extinctions (holes of any age in 1991, no holes in 1997), and long-term colonizations (no holes in 1991, holes of any age in 1997). Collinge *et al.* (2001, pp. 106–107) related findings on both short- and long-term changes because they felt that the long-term values tended to underestimate actual numbers of extinctions and colonizations, whereas the short-term values tended to overestimate them. For instance, they noted that a local extinction would not register as a long-term extinction if old holes remained in the area. Similarly, because the beetle can remain as a larva in an elderberry stem for up to 2 years, a survey for exit holes during a given year might miss its presence and thus register as a short-term extinction. We also note that the number of short-term extinctions and colonizations is subject to additional error based on timing of surveys, because the Barr (1991) and Collinge *et al.* (2001) surveys were conducted from April to July (Barr 1991) or April to June (Collinge *et al.* 2001, p. 105), while the adult beetles emerge (and thus create new exit holes) from mid-March to mid-June (Talley *et al.* 2006a, p. 9). In other words, an error documenting beetle presence could occur in a given year because (for example) beetles could potentially emerge in June after a survey is conducted in April.

The overall trend of valley elderberry longhorn beetle occupancy was moderately downward when comparing the 1991 and 1997 survey data (described above), as indicated by both short- and long-term extinctions and colonization sites with elderberry shrubs and by occupied shrub groups within each site (Talley *et al.* 2006a, p. 13). Collinge *et al.* (2001, pp. 107–108) reported that of 65 sites with mature elderberry visited in both surveys, 9 sites suffered short-term extinctions while 6 underwent short-term colonizations. They also related two long-term extinctions, as compared to four long-term colonizations. However, as Talley *et al.* (2006a, p. 13) noted, there were actually 9 long-term extinctions out of 72 sites that Barr had surveyed in 1991, because 7 of those sites had lost all their elderberry shrubs between studies (Collinge *et al.* 2001, p. 105), and so were not included in the statistics reported by Collinge *et al.* (2001, p. 107). According to Collinge *et al.* (2001, p. 110), the location discussed in this rule that exhibited no recent holes at any site in 1997, but did so in 1991, is Stony Creek. Several other entire watersheds with multiple elderberry sites examined revealed no beetles in either 1991 or 1997 (Paynes, Deer, and Butte Creeks). Collinge *et al.* (2001) did not identify the sites (or systems) lacking elderberry; however, Barr (1991, pp. 20–21, 25) did identify drainages without elderberries at any site examined (Cow, Battle, Cottonwood Creeks; Colusa and Sutter Basins). Barr (1991, p. 47) also noted eight localities where there was no sign of the beetle (exit holes or adults) where it had been previously reported.

Collinge *et al.* (2001) suggested that each drainage surveyed functions as a relatively isolated valley elderberry longhorn beetle metapopulation, separated from other such metapopulations by distances of 25 mi (40 km) or more (Collinge *et al.* 2001, pp. 108–110; Talley *et al.* 2006a, p. 10). Occupied sites within each metapopulation were found to be subject to extirpation, and also to recolonization from other occupied sites in the drainage within 12 mi (20 km) (Collinge *et al.,* 2001, p. 108). Accordingly, Collinge *et al.* (2001, p. 112) recommended that a proportion of occupied sites within a 12-mi (20-km) distance be considered in decisions regarding loss of riparian vegetation and placement of newly restored habitat for the beetle. Collinge *et al.* (2001, p. 110) concluded that, due to limited dispersal among metapopulations, when all the beetles in an entire drainage are extirpated, the drainage is unlikely to be naturally recolonized.

Of the 14 drainages surveyed by both Barr (1991) and Collinge *et al.* (2001), 7 were occupied by valley elderberry longhorn beetles in 1991. Six of those seven were found to still be occupied in 1997 (Collinge *et al.* 2001, pp. 106, 108; Talley *et al.* 2006a, p. 11). We note however that rather than surveying every elderberry shrub and branch, Collinge *et al.* (2001, p. 105) randomly selected distinct groups of elderberry shrubs to survey at each site.

In summary, minimal trend information exists related to valley elderberry longhorn beetle's rangewide population status. Collinge *et al.* (2001, pp. 106–107) identified four types of changes evident from comparison of the 1991 and 1997 surveys that included both short- and long-term extinctions and colonizations. Available survey data from Collinge *et al.* (2001) indicate that some river or watershed systems continue to harbor the beetle while others may not. However, because Collinge *et al.* (2001) did not survey all potential beetle habitat at each location, the beetle could still be present at

locations where it appears to be absent. Holyoak and Graves (2010, p. 20) found that because the beetle's local population levels and densities are typically very low, sampling levels must be very high in order to detect large population declines within a watershed. Regardless of extinctions or colonizations, each watershed system that is occupied by the beetle may serve as an isolated metapopulation with limited dispersal capabilities; thus the ability for natural recolonization (following an extirpation event) within an individual watershed system may be unlikely (Collinge *et al.* 2001, p. 110).

Recovery Planning and Implementation

Section 4(f) of the Act directs us to develop and implement recovery plans for the conservation and survival of endangered and threatened species unless we determine that such a plan will not promote the conservation of the species. The Act directs that, to the maximum extent practicable, we incorporate into each plan:

(1) Site-specific management actions that may be necessary to achieve the plan's goals for conservation and survival of the species;

(2) Objective, measurable criteria, which when met, would result in a determination, in accordance with the provisions of section 4 of the Act, that the species be removed from the list; and

(3) Estimates of the time required and cost to carry out the plan.

Revisions to the list (adding, removing, or reclassifying a species) must reflect determinations made in accordance with sections 4(a)(1) and 4(b) of the Act. Section 4(a)(1) that requires that the Secretary determine whether a species is endangered or threatened (or not) because of one or more of five threat factors. Objective, measurable criteria, or recovery criteria contained in recovery plans, must indicate when we would anticipate an analysis of the five threat factors under 4(a)(1) would result in a determination that a species is no longer endangered or threatened. Section 4(b) of the Act requires the determination made be ''solely on the basis of the best scientific and commercial data available.''

While recovery plans are intended to provide guidance to the Service, States, and other partners on methods of minimizing threats to listed species and on criteria that may be used to determine when recovery is achieved, they are not regulatory documents and cannot substitute for the determinations and promulgation of regulations required under section 4(a)(1) of the Act. Determinations to remove a species from the list made under section 4(a)(1) of the Act must be based on the best scientific and commercial data available at the time of the determination, regardless of whether that information differs from the recovery plan.

In the course of implementing conservation actions for a species, new information is often gained that requires recovery efforts to be modified accordingly. There are many paths to accomplishing recovery of a species, and recovery may be achieved without all criteria being fully met. For example, one or more recovery criteria may have been exceeded while other criteria may not have been accomplished, yet the Service may judge that, overall, the threats have been minimized sufficiently, and the species is robust enough, that the Service may reclassify the species from endangered to threatened or perhaps delist the species. In other cases, recovery opportunities may have been recognized that were not known at the time the recovery plan was finalized. These opportunities may be used instead of methods identified in the recovery plan.

Likewise, information on the species may be learned that was not known at the time the recovery plan was finalized. The new information may change the extent that recovery criteria need to be met for recognizing recovery of the species. Overall, recovery of species is a dynamic process requiring adaptive management, planning, implementing, and evaluating the degree of recovery of a species that may, or may not, fully follow the guidance provided in a recovery plan.

Thus, while the recovery plan provides important guidance on the direction and strategy for recovery, and indicates when a rulemaking process may be initiated, the determination to remove a species from the Federal List of Endangered and Threatened Wildlife is ultimately based on an analysis of whether a species is no longer endangered or threatened.

When the Service completed the final Valley Elderberry Longhorn Beetle Recovery Plan (Recovery Plan) in 1984 (Service 1984, pp. 1–62), there was little information regarding the beetle's life history, distribution, and habitat requirements to develop specific recovery objectives (Service 1984, p. 21). The development of these objectives was left for a later date (Service 1984, p. 39), and the Recovery Plan instead described four primary interim objectives (Service 1984, pp. 22). This was followed by an outline and narrative (referred to as the Step-Down Outline that includes many discrete recovery actions), including three of the four primary interim objectives, and four additional objectives that are interpreted as recovery actions (these latter four additional objectives are further described below in the section titled ''Additional Recovery Objectives.'') The determination of delisting criteria is considered a discrete action within the Recovery Plan's narrative, Step 3—Determine ecological requirements and management needs of VELB (Service 1984, pp. 35–39). The four primary interim objectives were (Service 1984, p. 22):

(1) Protect the three known locations of the beetle;

(2) Survey riparian vegetation along certain Central Valley rivers for the beetle and habitat;

(3) Protect remaining beetle habitat within its suspected historical range; and

(4) Determine the number of sites and populations necessary to eventually delist the species.

In the following paragraphs, we address the extent to which the four primary interim objectives (criteria) have been accomplished.

Primary Interim Objective 1—Protect the Three Localities of Valley Elderberry Longhorn Beetles

The intent of this primary interim objective was to ensure that the three localities of the valley elderberry longhorn beetle known at the time the Recovery Plan was written in 1984 (American River in Sacramento County, Putah Creek in Yolo and Solano Counties, and Merced River in Merced County) would continue to sustain the subspecies and the necessary habitat components on which the subspecies depends at those locations.

The Recovery Plan states that the American River sites may be adequately protected through provisions of the American River Parkway Plan (Service 1984, p. 32). The River Corridor Management Plan for the Lower American River (Lower American River Task Force 2002, p. 94) refers to a future funded action to develop a valley elderberry longhorn beetle management plan that would include mapping, identification of stressors, and management protocols to avoid impacts. More recently, the American River Parkway Plan (County of Sacramento 2008) refers to an Integrated Vegetation and Wildlife Management Plan as pending, and references the 2002 Lower American River Corridor Plan for interim guidance. It includes generalized measures to maintain the beetle and its habitat into the foreseeable future (Talley *et al.* 2006a, p.

61; County of Sacramento 2008, pp. 9, 17, 52). Habitat supporting the American River beetle population is intended by respective local jurisdictions to remain as open space in which natural values are maintained and enhanced. These areas are important public recreational areas, and so, are not without localized manmade disturbances such as trail maintenance and trampling, but overall are not presently at risk of loss to agricultural or urban development. However, the 2002 Lower American River Corridor Plan does not identify specific monitoring or reporting requirements, remedial actions to address remaining threats, or the mechanism by which the plan goals are to be funded and implemented over the long term.

Similar guiding documents have been developed for Putah Creek, which may (if implemented) maintain the valley elderberry longhorn beetle at publicly accessible locations, where management focuses on maintaining natural habitat rather than protecting the beetle specifically (University of California at Davis 2005, pp. 24–33, App. A, p. 1; Gates and Associates 2006, pp. 13–15; Talley *et al.* 2006a, p. 61; University of California at Davis 2009, pp. 24–29). Portions of Putah Creek are in parkland while the remaining privately owned areas are not currently developed. Similar to the American River Parkway Plan, the Putah Creek Management Plan lacks specificity on monitoring, reporting, and funding.

The Recovery Plan states that the beetle location on the Merced River is from the McConnell State Recreation Area (Service 1984, p. 31). Evidence of the beetle (exit holes) was not observed by Barr (1991), but was noted in a 2010 non-CNDDB record (Table 1). We are unaware of the status of management of beetle habitat at this site.

Primary Interim Objective 1—Achievement Evaluation and Summary

Completion of Primary Interim Objective 1, with respect to the original intent of the Recovery Plan, would be represented by three locations that are preserved or protected with a reduction of threats to the valley elderberry longhorn beetle and its habitat. Threats would be addressed through ongoing management actions outlined in respective management plans. The Recovery Plan describes long-term administrative actions appropriate to protect and secure known colonies, to include coordinated long-term agreements (such as cooperative agreements, memoranda of understanding, or conservation easements) among primary resource management agencies (such as California Department of Water Resources, California Water Resources Control Board, U.S. Bureau of Reclamation, U.S. Army Corps of Engineers, County governments, and private landowners) (Service 1984, p. 30).

This objective is partially met by management planning efforts along the American River and Putah Creek; we are uncertain of the status of protection and management planning and implementation at the Merced River location. The development of management plans that emphasize open space and natural values for riparian areas that support the valley elderberry longhorn beetle along the American River Parkway and Putah Creek are considered beneficial to the beetle and its habitat into the future. As we discuss in further detail below, parklands such as these are facing increased pressures from human use as population centers have expanded since listing, and management plans lack sufficient specificity with respect to the subspecies or its host plant to ensure long-term persistence. We are unaware of regular monitoring of beetles or elderberry shrubs in these areas, from which recovery might be assessed. While there is no monitoring of beetles or elderberry shrubs in these areas, nor funding targeted on restoration or enhancement specifically for the beetle and its habitat, the beetle derives long-term benefit and prospects for persistence at these sites from management emphasis on maintaining riparian vegetation on the American River and Putah Creek.

Primary Interim Objective 2—Survey Riparian Vegetation Along Certain Central Valley Rivers for Additional Valley Elderberry Longhorn Beetle Colonies and Habitat

As discussed throughout this document, the valley elderberry longhorn beetle was known at the time of listing from only three locations. Since listing, observations of the beetle have been recorded at 26 locations throughout the Central Valley (Table 1). The occurrence of additional populations was anticipated in both our listing rule and Recovery Plan (Service 1980, p. 52804; Service 1984, p. 32). The Recovery Plan recommended surveys within the suspected range of the beetle along portions of the Sacramento, Feather, Tuolumne, Stanislaus, Mokelumne, Calaveras, Cosumnes, and San Joaquin Rivers (Service 1984, pp. 23, 32–35). The intent of this interim objective was to document the existence of additional populations so that they could then be protected as described in Primary Interim Objective 3.

Primary Interim Objective 2—Achievement Evaluation and Summary

Achievement of this objective with respect to the original intent of the Recovery Plan is represented by completion of surveys in the above-named locations that resulted in the reporting of 23 additional locations of the valley elderberry longhorn beetle throughout the Central Valley. Many of these surveys are old, and the subspecies would benefit from further survey information throughout the Central Valley to update information and provide guidance for additional protection and restoration actions, as was originally contemplated in the Recovery Plan. The subspecies is more widespread than had been documented at the time of listing. The cumulative increase in beetle occurrences and increase in the known range of the subspecies in the Central Valley is considered sufficient to meet the original intent of Primary Interim Objective 2.

Primary Interim Objective 3—Protect Remaining Beetle Habitat Within Its Suspected Historical Range

The intent of this recovery criterion was to ensure that newly discovered valley elderberry longhorn beetle habitat would be protected. The Recovery Plan (Service 1984, p. 40) describes administrative actions to protect newly discovered habitat, including a cooperative agreement or memorandum of understanding with the U.S. Army Corps of Engineers (Corps) to conduct surveys for valley elderberry longhorn beetle for activities they permit in riparian areas, as well the interagency consultation requirements of section 7 of the Act.

Of the 23 locations discovered since the Recovery Plan was prepared, 10 contain well-protected lands such as State or Federal wildlife areas, or areas with conservation easements (Bear River, Cosumnes River, Feather River, Sacramento River, Stony Creek, Big Chico Creek, Butte Creek, Tuolumne River, Kaweah River, and San Joaquin River). Portions of five locations are managed for natural and open space values, are partially on city parks or Forest Service lands, and have current protections against urban development, but no specific protections for the valley elderberry longhorn beetle or elderberry shrubs (Big Chico Creek, Lower Stanislaus River, Kings River, Upper Stanislaus Hills, and a portion of the Kaweah River upstream of Lake Isabella). The remaining locations, or

portions of locations, are on lands without protections, some of which are private lands or designated floodways that experience activities that may adversely affect the beetle (primarily vegetation suppression from bank protection and vegetation removal on levees and within floodway channels), or protections are unknown. This includes some sections of the Sacramento River from Colusa to the American River confluence, Thomes Creek, Yuba River, Upper American River, Cache Creek, Ulatis-Green Valley Creeks, Upper Stanislaus Hills, Calaveras River-Stockton Diverting Canal, Mokelumne-Bear Rivers, Kings River, Tule River-Deer Creek, Kern River, and Caliente Creek.

Primary Interim Objective 3—Achievement Evaluation and Summary

Achievement of criterion 3 with respect to the original intent of the Recovery Plan would be represented by protection of the remaining suitable habitat at newly discovered occupied beetle locations. This criterion is considered partially met because the protections discussed in our Recovery Plan have been applied to all or portions of 13 of the 23 newly discovered locations. Protections at all or portions of 12 locations described above are either lacking or unknown. Some locations have varying degrees of protection in different areas and have been counted in more than one category. Several of the newly discovered localities are now preserved and managed for at least the conservation of natural values associated with riparian vegetation, including, if not specifically for, the beetle. Such management is being applied to occupied and unoccupied sites within these locations. Management activities at these locations include habitat restoration to increase the amount of suitable habitat for potential use by the beetle. We consider Primary Interim Objective 3 to be partially met.

Primary Interim Objective 4—Determine the Number of Sites and Populations Necessary To Eventually Delist the Species

The intent of this primary interim objective was to utilize the results of surveys and other information to determine the areal extent and number of populations of valley elderberry longhorn beetle that would be needed to delist the subspecies. Our 1984 Recovery Plan stated that this would be determined (Service 1984, p. 39) ''in part * * * by the remaining habitat and beetles found during survey work.'' Thus, the delisting criteria would not be solely based on survey information, but also based on information derived from other actions described in the step-down narrative, including but not limited to, life history, population structure, limiting factors, adult behavior, site-specific management needs, tests of the effectiveness of various management practices, and other factors. To date, specific delisting recovery criteria have not been developed.

Primary Interim Objective 4—Achievement Evaluation and Summary

A greater number of beetle occurrences have been discovered than we previously anticipated, which has resulted in a total of 26 locations known today compared to 3 locations known at the time of listing. The new detections of the beetle in riparian vegetation throughout the Central Valley (as compared to only Sacramento, Yolo, Solano, and Merced Counties at the time the Recovery Plan was written) have altered our understanding of the subspecies' range and distribution. This improved understanding, together with restoration, habitat management, and protection implemented at various locations to date, have led us to determine that the beetle can persist without the protections of the Act. The status review and five-factor analysis contained in this proposed rule provide the information on which our delisting proposal is based.

Additional Recovery Objectives

As discussed above in this section, the Recovery Plan described four primary interim objectives (Service 1984, p. 22). The Recovery Plan also includes an outline and narrative (referred to as the Step-Down Outline), which contains four additional recovery objectives that are interpreted as recovery actions. These four additional recovery objectives (hereafter referred to as additional recovery actions) are a sample of the actions outlined in the narrative of the Recovery Plan that have been implemented for the benefit of the valley elderberry longhorn beetle. The four additional recovery actions summarized here are directly related to the primary interim objectives and include: (1) Determining the beetle's ecological requirements and management needs, (2) reestablishing the beetle at rehabilitated sites, (3) increasing public awareness of the beetle, and (4) enforcing existing laws and regulations protecting the beetle (Service 1984, pp. 22–26). A summary of our evaluation of these additional recovery actions is shown in the following four paragraphs, thus providing information for the public on the extent to which we have implemented and completed these actions.

1. Determine the valley elderberry longhorn beetle's ecological requirements and management needs. Significant progress has been made in our understanding of the beetle's autecology, life history, and habitat restoration, but aspects of the beetle's population dynamics and dispersal remain less well understood (Talley *et al.* 2006a, p. 62). The draft PDM Plan includes monitoring that will help address deficiencies.

2. Reestablish the valley elderberry longhorn beetle at rehabilitated sites. Rehabilitated sites can be divided into those established in conjunction with incidental take of existing habitat under section 7 of the Act, and those established without associated incidental take. Approximately 400 to 1,900 ac (162 to 769 ha) of land fall into the first category (i.e., rehabilitated sites associated with section 7 consultation incidental take permits), based on a review of 110 out of 526 section 7 consultations involving the beetle (Service 2006a, p. 7). Of that restored habitat, about 43 to 53 percent (172 to 1,007 ac; 70 to 408 ha) has successfully been colonized by the beetle (Holyoak and Koch-Munz 2008, p. 1; Holyoak *et al.* 2010, p. 50). Approximately 4,000 ac (1,619 ha) of land fall into the second category of rehabilitated sites (i.e., rehabilitated sites that are not associated with incidental take permits) (see Factor A, ''Conservation—Habitat Restoration and Protection'' section below for additional information on restored beetle habitat). The extent of that restored habitat that has been colonized by the beetle remains unknown at this time (Talley 2006a, p. 50).

3. Increase public awareness of the valley elderberry longhorn beetle. We maintain information on the beetle at *http://www.fws.gov/sacramento/es_species/Accounts/Invertebrates/es_species-accounts_invertebrates.htm,* and the University of California at Berkeley maintains an informational Web site on the beetle (*http://essig.berkeley.edu/endins/desmocer.htm*). Additionally, organizations involved in habitat restoration for the beetle have occasionally published relevant information in newsletters, press releases, and Web sites (Community Business Bank 2008, p. 1; Environmental Defense 2010, pp. 1–2; River Partners 2010, p. 2).

4. *Enforce existing laws and regulations protecting the valley elderberry longhorn beetle.* As discussed below for current estimates under the

Factor A, ''Conservation—Habitat Restoration and Protection'' section, approximately 21,536 ac (8,715 ha) of riparian vegetation have been protected through either a conservation easement, riparian fee land managed by CDFG, or public land known to be managed for conservation values (such as Cosumnes River Preserve). Additionally, approximately 13,000 ac (5,261 ha) of riparian vegetation has been restored on predominantly Federal and State lands, and other areas have had beetle habitat restored, totaling approximately 12,400 ac (5,018 ha). Note, however, that there is significant, albeit incomplete, overlap among these vegetation estimates as further described in the current estimates section under Factor A, ''Conservation—Habitat Restoration and Protection.'' Regardless, these areas are subject to various laws or regulations. For example, conservation easements are held by qualified environmental protection organizations, and will be enforced under the terms of California Civil Code sections 815 through 816. Another example includes protection to riparian vegetation and beetle habitat on NWR lands as a result of the National Wildlife Refuge System Improvement Act of 1997 (see ''Federal Protections'' section under Factor D below). This refuge system legislation supports various management actions that benefit valley elderberry longhorn beetle through the mandatory development and implementation of Comprehensive Conservation Plans.

Results of Recovery Plan Review

The Recovery Plan did not include recovery criteria, but did include four primary interim objectives that were to be addressed initially and used to develop recovery criteria. Our review indicates that interim objective 1 is partially met by management and planning efforts at two of the three originally known locations of the valley elderberry longhorn beetle. Interim objective 2 is met because surveys were conducted throughout the range of the subspecies and identified 23 additional locations at which the valley elderberry longhorn beetle was present. However, much of this information is old, and additional surveys should be conducted at these locations and others. Interim objective 3 is considered partially met because the protections discussed in the Recovery Plan have been applied to all or portions of 13 of the 23 locations discovered since listing (or since the Recovery Plan was finalized). Interim objective 4 is considered partially met, noting that recovery of species is a dynamic process requiring adaptive management, planning, implementing, and evaluating the degree of recovery of a species that may, or may not, fully follow the guidance provided in a recovery plan. Notwithstanding data uncertainties and the absence of protections or enhancements at some locations, there are a significantly greater number of known occurrences and locations of the beetle (resulting in a significantly greater range size as compared to the time of listing) across the Central Valley. Based on our review of the Recovery Plan for the subspecies and our review of the beetle's status under section 4(a)(1) of the Act presented below, we are proposing to remove the valley elderberry longhorn beetle from the List of Endangered and Threatened Wildlife.

Summary of Factors Affecting the Species

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for adding species to, reclassifying species on, or removing species from the Federal List of Endangered and Threatened Wildlife (List). We may determine a species to be an endangered or threatened species due to one or more of the five factors described in section 4(a)(1) of the Act. The five listing factors are: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; and (E) other natural or manmade factors affecting its continued existence. We must consider these same five factors in delisting a species. We may delist a species according to 50 CFR 424.11(d), if the best available scientific and commercial data indicate that the species is neither endangered nor threatened for the following reasons: (1) The species is extinct; (2) the species has recovered and is no longer endangered or threatened (as is the case with the valley elderberry longhorn beetle); or (3) the original scientific data used at the time the species was classified were in error.

We took the following steps in order to examine the scale of threats and potential for extinction for the valley elderberry longhorn beetle within the 26 known beetle locations and as a whole:

(1) We compiled a rangewide GIS spatial database that included all available information on beetle records, riparian vegetation, section 7 consultations, mitigation actions, conservation and other protection actions (including specific plantings of elderberry shrubs), current (year 2010) aerial imagery, roadways, and near-term population growth (i.e., through the year 2020).

(2) We used the database (described in step 1 above) and supporting information to synthesize a best professional opinion of the prospectus for persistence with delisting at those locations, considering current habitat; occupation records by location (presented previously in Table 1); threats; protections and recovery actions; and studies needed to address uncertainties in species data, protections, threats, and prospectus for persistence.

The five factors listed under section 4(a)(1) of the Act and their analysis in relation to the beetle are presented below (additional discussion is presented in the Finding section below regarding these threats within the context of the north Central Valley, south Central Valley, and the subspecies as a whole across its range). This analysis of threats requires an evaluation of both the threats currently facing the subspecies and the threats that could potentially affect it in the foreseeable future, following the delisting and the removal of the Act's protections. The Act defines an endangered species as a species that is in danger of extinction throughout all or a significant portion of its range (16 U.S.C. 1632(6)). A threatened species is one that is likely to become an endangered species in the foreseeable future throughout all or a significant portion of its range (16 U.S.C. 1632(20)).

In considering what factors might constitute threats, we must look beyond the exposure of the species to a particular factor to evaluate whether the species may respond to the factor in a way that causes actual impacts to the species. If there is exposure to a factor and the species responds negatively, the factor may be a threat, and during the status review, we attempt to determine how significant a threat it is. The threat is significant if it drives or contributes to the risk of extinction of the species, such that the species warrants listing as endangered or threatened as those terms are defined by the Act. However, the identification of factors that could impact a species negatively may not be sufficient to compel a finding that the species warrants listing. The information must include evidence sufficient to suggest that the potential threat is likely to materialize and that it has the capacity (i.e., it should be of sufficient magnitude and extent) to affect the species' status such that it meets the definition of endangered or threatened under the Act.

Factor A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

At the time of listing, habitat destruction was identified as one of the most significant threats to the valley elderberry longhorn beetle (45 FR 52805, August 8, 1980; Eng 1984, pp. 916–917). This section analyzes four threats that have been identified to impact, or potentially impact, the valley elderberry longhorn beetle under Factor A:

(1) Agricultural and urban development;

(2) Levees and flood protection;

(3) Road maintenance and dust; and

(4) Climate change.

We also include a discussion on the habitat restoration and protection efforts afforded the subspecies in response to Factor A threats (see ''Conservation—Habitat Restoration and Protection'' below). Finally, we note that Talley *et al.* (2006, pp. 44–46) also mentions pollution, competition with invasives, and grazing as potential factors affecting elderberry shrubs, which are both Factor A and E threats within the context of this five factor analysis; however, none of these appear to be well studied and are not identified as widespread threats.

Agricultural and Urban Development

As discussed above (''Lost Historical Range'' section), a significant amount of riparian vegetation (of which a portion contained elderberry shrubs) has been converted to agriculture and urban development since the mid-1800s according to estimates by Thompson 1961 (pp. 310–311) and Katibah *et al.* 1984 (p. 314). For example, Lang *et al.* (1989, p. 243) observed less riparian vegetation (as well as significantly fewer sites occupied by the beetle) in the lower reach of the Sacramento River (between Sacramento and Colusa), than in the northern reach (Chico to Red Bluff). This decrease in riparian vegetation was attributed to extensive flood control activities (which are directly related to agricultural and urban development, and further discussed in the Factor A, ''Threats—Levees and Flood Protection'' section below), predominantly carried out prior to the valley elderberry longhorn beetle's listing, but some such activities have occurred since listing and continue to occur today (CVFMPP 2010).

Although riparian vegetation in the Central Valley has been lost over time, a number of areas have been restored to accommodate the habitat needs and recovery of the valley elderberry longhorn beetle (riparian vegetation that specifically contains elderberry shrubs), as described in detail in Factor A, ''Conservation—Habitat Restoration and Protection'' below. To provide an indication of the amount of beetle habitat lost and restored since the beetle's listing in 1980, we reviewed Federal projects for which we conducted consultations for the beetle under section 7 of the Act. As part of these consultations, incidental take for the beetle was measured in terms of acres of habitat impacted, because incidental take of beetles themselves could not be determined due to the biology of the subspecies and difficulty in monitoring it. From 1983 to 2006, the incidental take we authorized amounted to roughly 10,000 to 20,000 ac (4,047 to 8,094 ha) of potential beetle habitat (both occupied and suitable; suitable is defined as habitat that contains mature elderberry shrubs with stems of at least 1 in. (2.5 cm) in diameter), primarily for projects associated with urbanization, transportation, water management, and flood control (Talley *et al.* 2006a, pp. 31–34). See the Factor A, ''Levees and Flood Protection'' section below for discussion of water management and flood control activities.

Although incidental take authorized by section 7 consultations has occurred throughout the current range of the subspecies, it has been concentrated in areas predominantly developed prior to the subspecies' listing under the Act. Additionally, not all of the incidental take authorized by those section 7 consultations has been carried out, so the number of actual acres of habitat lost is some unknown degree less than the number of acres of habitat we anticipated (Talley *et al.* 2006a, p. 34). Incidental take authorized through the section 7 consultation process would have included elderberries associated with both riparian and upland vegetation, as well as stems with, and without, exit holes. Stems without exit holes are included because absence of the beetle in a specific shrub cannot be determined with 100 percent certainty due to the fact that use of the elderberry by the beetle is not always apparent (Talley *et al.* 2006a, p. 10).

In addition to evaluating section 7 Federal projects to provide an indication of the amount of elderberry shrubs lost or restored since the valley elderberry longhorn beetle's listing, we reviewed the 20 incidental take permits issued to non-Federal entities (undertaking otherwise lawful projects that might result in the take of an endangered or threatened species) under section 10(a)(1)(B) of the Act. The majority of these permits minimally impacted the beetle or its habitat (elderberry shrubs), and only eight of those permits are still active. We issue these permits only upon our approval of a habitat conservation plan (HCP) that is developed, funded, and implemented by the permittee, and that adequately minimizes and mitigates the effects of incidental take associated with the proposed activity. Incidental take associated with the 12 expired permits is estimated at less than 100 ac (40 ha) of beetle habitat. For the eight active permits, 4,808 ac (1,946 ha) of take is permitted, and all of the corresponding HCPs contain elderberry shrubs and evidence of at least past occupancy (exit holes) of the beetle within their boundaries (noting that at least one known beetle location is addressed by each HCP). Section 10(a)(2)(B)(ii) of the Act requires HCP applicants to agree to mitigate takings of identified species ''to the maximum extent practicable.'' These mitigation requirements are built into each HCP implementing agreement, so even if the beetle is delisted they will continue to apply within the bounds of the HCPs.

Unauthorized impacts to the beetle or elderberry host plant are likely to have occurred, and the Service is aware of examples. Talley *et al.* (2006, p. 34) report that most of this unauthorized activity is unmonitored; some settlements have occurred, and none of these has been pursued to the point of penalties or prosecution under the Act.

Conversion of agricultural lands to urban areas and direct urbanization of natural areas that include riparian vegetation continue to impact the valley elderberry longhorn beetle, because elderberry is a minor component of the vegetation that grows (in some areas) along existing irrigation channels, on hedgerows, and on, and adjacent to, levees that provide flood control to this agriculture. Existing agriculture continues to affect beetle habitat through suppression of vegetation in, what are now, channelized tributaries and split channels that function for drainage and irrigation. For example, vegetation suppression occurs in channelized tributaries or split channels at approximately two locations in the north Central Valley (Sacramento River-Chico to Colusa and the Ulatis-Green Valley Creeks locations) and more frequently at approximately six locations in the south Central Valley (Lower Stanislaus hills, Calaveras River-Stockton Diverting Channel, Merced River, Kings River, Kaweah River, and Caliente Creek). Agricultural lands provide the additional benefit of buffering natural lands, whereas urban land uses most often do not. Agricultural development has probably reached close to its maximum extent in

the Central Valley. However, conversion of agricultural lands into urban development continues at a significant rate (American Farmland Trust 2011), and as a consequence, continues to affect beetle habitat by eliminating elderberries along irrigation channels and hedgerows, eliminating the buffering effect, and precluding the potential to restore riparian forest vegetation (discussed further below). Current conversion of agricultural lands (and subsequent elimination of riparian vegetation and in some cases elderberry) is evident in the north Central Valley (such as along the Sacramento River between Red Bluff and Chico and the Yuba River) and south Central Valley (such as the Calaveras River-Stockton Diverting Channel and the Kaweah River).

During the 1990s, the Central Valley experienced a decline of about 223,000 ac (90,245 ha) of high-quality farmland (American Farmland Trust 2011). Although some of this is due to reclassification, about 100,000 ac (40,469 ha) is considered to have been urbanized (homes, businesses, impervious surfaces) (American Farmland Trust 2011). Between 2000 and 2002, 27,000 ac (10,926 ha) of farmland were urbanized (American Farmland Trust 2011). Examples of light residential or rural ranchette development since listing (most recent) are evident in areas along as the Consumnes River (in the vicinity of the towns of Wilton and Rancho Murieta), Bear River (east of Lodi, with documented 1984 valley elderberry longhorn beetle record), Cache Creek (north and adjacent to the city of Woodland), the Kern River (expansion of Bakersfield), and many other locations throughout the State. Most of these developments have resulted in some direct loss of beetle habitat, as evidenced by consultation actions.

In sum, losses of valley elderberry longhorn beetle habitat associated with agricultural activities through conversion to urban uses is likely to occur to some extent because elderberry is a minor component of vegetation along irrigation channels, levees, and hedgerows, and agriculture is a major land use adjacent to the Sacramento and San Joaquin Rivers and their tributaries. Many of the 26 locations in both the Sacramento and San Joaquin Valleys, as well as to areas outside of the 26 locations are affected by this activity. However, compared to the past loss of beetle habitat that resulted from flood control and agricultural development, future losses are likely to result from progressive conversion of agriculture into urban growth.

The range of the valley elderberry longhorn beetle is now known to be greater than at the time of listing, and it is known from 26 locations throughout the Central Valley. The bulk of habitat protection and restoration activities have occurred in the northern Central Valley locations. In the south Central Valley, where historical habitat losses are believed to have been greater, a more limited quantity of protected and restored beetle habitat exists. Even with consideration of the restoration activities that have occurred in the subspecies' range (see the Factor A, ''Conservation—Habitat Restoration and Protection'' section below), the threat posed by agricultural and urban development (including activities that impact the vegetation that grows along existing irrigation channels, levees, etc.) may continue into the future in both the north and south Central Valley as urban growth places agricultural lands and associated riparian vegetation at further risk.

Levees and Flood Protection

The flood protection system in California's Central Valley includes about 1,600 mi (2,575 km) of Federal project levees, 1,200 mi (1,931 km) of designated floodways, 26 project channels covering several thousand acres, and 56 other major flood protection works. Projects that may have impacted, or could impact, valley elderberry longhorn beetle habitat include: levee construction; bank protection; channelization; facility improvements or ongoing maintenance activities, including clearing and snagging; construction of bypasses; and construction of ancillary features (such as overflow weirs and outfall gates). Some of these projects or facilities predate Federal authorization, and either meet, or are modified to meet (through current or future activities), Federal standards. Many predate listing, although some facilities have been constructed since listing, and additional projects are proposed for imminent construction.

Construction and maintenance of these flood protection systems and associated reservoir flood control facilities have resulted in direct losses of riparian vegetation within project impact areas, and indirect impacts in surrounding riparian vegetation due to agricultural and urban development that resulted from flood protection (see Factor A, ''Agricultural and Urban Development'' above). Flood control facilities are also subject to vegetative removal activities to maintain flood capacity or alleviate perceived levee risks (see below).

Examples of past major activities in the north Central Valley include the Sacramento River Flood Control Project (980 mi (1,577 km) of levees); Sacramento River Major and Minor Tributaries (channel enlargement of portions of Chico, Mud, Dandy Gulch, Butte, Little Chico, Elder, and Deer Creeks); American River Flood Control Project (18 mi (29 km) of levee); Sacramento River Chico Landing to Red Bluff (increased bank protection); Lake Oroville-New Bullards Bar (reservoir footprints); and the Sacramento River Bank Protection Project (915,000 linear feet (ft) (279 km) of bank protection in Phases I and II with Phase III not yet specified). Examples of past major activities in the south Central Valley include the Lower San Joaquin-River and Tributaries project (major flood control activities) and the Mormon Slough Project (levees, channel improvements, pumping plants). With the exception of the Cosumnes River, major multi-purpose dams exist on both north and south Central Valley mainstems and all major tributaries, including those at the following locations: Lake Shasta, Black Butte Lake, Folsom Lake, Lake Oroville, New Bullards Bar Reservoir, Lake McClure, Don Pedro Reservoir, New Melones Lake, Pardee Reservoir, Camanche Reservoir, New Hogan Lake, Bear River Reservoir, Owens Reservoir, Mariposa Reservoir, H.V. Eastman Lake, Hensley Lake, and Millerton Lake. Smaller dams exist in other locations within the range of the valley elderberry longhorn beetle. Tributaries in the southern portion of the south Central Valley (within the range of the beetle) have also been affected by major dams on the Kings River (Pine Flat Dam), Lake Success on the Tule River (Success Dam), and Kern River (Isabella Dam).

Flood control activities are evident as current threats and appear more frequently in the north Central Valley (such as the Lower American River and Cache Creek locations) and less frequently in the south Central Valley (such as Tule River-Deer Creek and San Joaquin River locations). Information presented in the following paragraphs is a more detailed account of potential impacts to remaining riparian vegetation (that may or may not contain elderberry shrubs) at existing facilities, including along levees, channels, etc., as previously introduced in the section above (Factor A, ''Agricultural and Urban Development'').

Currently, the State Plan of Flood Control (SPFC) in California's Central Valley is composed of 20 major projects along the Sacramento and San Joaquin Rivers and tributaries (CVFMPP 2010).

Projects within the Sacramento River basin include the following: Sacramento River Flood Control Project, Sacramento River and Major and Minor Tributaries Project, American River Flood Control Project, Sacramento River-Chico Landing to Red Bluff, Adin Project, Middle Creek Project, McClure Creek Project, Salt Creek Project, Lake Oroville Project, Sacramento River Bank Protection Project, and North Fork Feather River Project. Projects within the San Joaquin River basin include the following: Lower San Joaquin River and Tributaries Project, Buchanan Reservoir and Channel Improvement on Chowchilla River, Hidden and Hensley Lake Project, Merced County Streams Project, Bear Creek Project, Littlejohn Creek and Calaveras River Stream Group Project, Farmington Reservoir Project, and Mormon Slough Project. In addition to routine as-needed maintenance or improvements of the completed projects outlined above, other major activities or projects within the range of the valley elderberry longhorn beetle are expected, including:

(1) Ongoing projects, such as the American River Watershed Investigation, the Natomas Levee Improvement, and the West Sacramento Levee Improvement Project;

(2) Projects under other Corps authorities, such as RD 17 Phase III (San Joaquin River, north of Lathrop);

(3) Projects in the planning phase, such as the Feather River West Levee Project (44 mi (71 km)) from Thermolito Afterbay to the Sutter Bypass; and

(4) Projects under investigation but not yet authorized, such as the Sacramento River Bank Protection Project (SRBPP) Phase III.

Riparian vegetation losses from development projects have been compensated through a variety of restoration activities or protections of land, as described in various places throughout this document (for example, see the *Recovery Planning and Implementation* section (primary Interim Objective 3) above, or ''Conservation—Habitat Restoration and Protection'' below). It is likely that these activities have benefitted the valley elderberry longhorn beetle and its habitat.

We also anticipate that future actions will be implemented within the valley elderberry longhorn beetle's range to treat areas for flood damage under emergency authority (Pub. L. 84–99) on an as-needed basis, such as flood damage repairs made in 1997 and 1999. Past emergency actions (often involving placement of rock revetment) and continued maintenance since construction (which precludes or suppresses future vegetation growth) have affected hundreds of sites and many miles of river systems (such as the recent emergency levee repair conducted along the Sacramento River (American River confluence south). Maintenance practices are relatively frequent to achieve compliance with the Corp's standard operating procedures (for processing Department of the Army permit applications) and vary with location, ranging from twice a year to once every 5 years, or more, depending on specific site characteristics and need. These activities can damage or remove vegetation that could potentially provide beetle habitat.

Trees and shrubs grow to a variable extent on most of the State-Federal levees in the Central Valley; this vegetation (which in some instances may include elderberry shrubs) provides an important remnant of the riparian forest that once lined the Sacramento and San Joaquin Rivers and tributaries. Currently, there is no estimate of the acreage of riparian vegetation on Central Valley levees and other flood facility lands, nor of what portion of the riparian vegetation contains elderberry shrubs. The California Department of Water Resources is in the process of determining the acreage of woody vegetation on levees using recent aerial photography of the entire flood control system. This information was not available to us for analysis and consideration in this proposed rule.

Ongoing and future maintenance of levees, channels, and other facilities for purposes of flood control and agriculture may result in future losses of riparian vegetation and associated valley elderberry longhorn beetle habitat, or at least prevent establishment of additional beetle habitat on, and immediately adjacent to, levees or within channels that otherwise could benefit the beetle. The effect of flood control and associated maintenance on riparian vegetation varies somewhat with the extent of setback (if present) of the levee from the water's edge, and the magnitude of maintenance activities within the designated floodway. Although some locations do have vegetated areas on or adjacent to the floodway (such as the American River, unleveed portions of the Sacramento River from Red Bluff to Chico, Feather River portions of east bank), many do not. Flood control activities, combined with associated agricultural and urban development, are considered largely responsible for the loss of riparian vegetation throughout the beetle's range before and since listing, and also for the presence of less riparian vegetation along the lower Sacramento River compared to the upper Sacramento River. Specifically, the lower Sacramento River, Sacramento-San Joaquin Delta, and San Joaquin River contain areas that are constrained by flood control levees and areas of urban and agricultural development, thereby limiting future restoration opportunities in those areas.

The California Central Valley Flood Protection Board (Flood Protection Board; previously known as the Reclamation Board) oversees the Central Valley's flood control system, and has jurisdiction over the floodplains and levees on both sides of the waterways. For more than a decade, the Flood Protection Board has generally denied permits for projects that involve planting elderberry shrubs in floodplain areas between levees, because the Board is concerned that additional beetle habitat could interfere with, or delay, flood prevention measures (Talley *et al.* 2006a, p. 46). The Flood Protection Board is also concerned that flood prevention measures might damage valley elderberry longhorn beetle habitat and thereby lead to costly impact minimization requirements, such as habitat restoration. To date, restoration of beetle habitat has not been allowed within their facilities (River Partners 2003, p. 4; 2004b, p. 4); however, restoration or other minimization measures for vegetation loss has occurred at other locations within the range of the beetle.

Since listing, there have been nationwide changes to Corps flood control system maintenance requirements. Specifically, on April 10, 2009, the Corps issued Engineering Technical Letter (ETL) 1110–2–571 (Guidelines For Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures). This ETL standard establishes a vegetation-free zone for the top of all levees and levee slopes, and 15 ft (4.5 m) on both the water and land sides of levees (which could potentially eliminate occupied or unoccupied elderberry shrubs that may be present). Currently, and in specific cases, the Corps provides for the potential issuance of variances from the standard vegetation guidelines in the ETL, which in turn provides opportunities to maintain or improve valley elderberry longhorn beetle habitat throughout its range. Variances may be issued to further enhance environmental values or meet State and Federal laws and regulations. The variance must be shown to be necessary, and to be the only feasible means to: (1) Preserve, protect, and enhance natural resources; or (2) protect the rights of Native

Americans, pursuant to treaty and statute. In major portions of some levee systems where vegetation is already limited or absent (such as the Sacramento River between Sacramento and Colusa), the variance process is a possible means by which some increment of beetle habitat may be restored. Following the Corps' recent proposal to revise the current process for requesting variances from the ETL (75 FR 6364; February 9, 2010), the Service has continued to work with the Corps and others to seek a collaborative solution where a vegetation variance, tailored to regional conditions, can be issued. This cooperative partnership regarding the specifics of granting variances remains valuable for the long-term conservation of the beetle and its habitat because granting a variance would allow some woody vegetation, including elderberry shrubs, to remain in place or be planted on levees.

We are not presently able to determine how many levee segments may be eligible for a variance. At the time of this proposal, the Service does not consider the variance process to be a reliable and consistent means of assuring the protection and persistence of beetle habitat where it is at risk of loss from flood control activities. We conclude this because a variance has been granted only once in the past. The Corps is currently preparing to issue a public draft of a new policy guidance letter for the variance process; thus, we do not know the extent to which the Corps may be willing to accommodate variances for woody vegetation that may include elderberry shrubs in the future variance process.

In addition to ongoing work with the Corps regarding the variances, some parts of the State-Federal flood protection system in the Central Valley currently meet the ETL standards for vegetation, and the State will enforce the standards in those areas in the future. New levees being added to a flood protection system (such as setback levees, backup levees, and ring levees) will also be designed, constructed, and maintained to ETL standards. This means the type and stature of vegetation that provides valley elderberry longhorn beetle habitat will continue to be suppressed, although additional habitat would be available off the levees within new levee areas. The older and original levees built immediately adjacent to California's major riverine systems present unique challenges that may require regional variances or other engineered alternatives if vegetation is to remain, or else they too may be required to establish and maintain the vegetation-free zones required by the ETL (as described in the preceding paragraph).

The Sacramento Area Flood Control Association sponsored a symposium to discuss issues related to levees and vegetation in August 2007. The symposium led to formation of the California Levees Roundtable, a collaborative partnership of Federal, State, and local officials. A product of the Roundtable was the release of the *California's Central Valley Flood System Improvement Framework* document (Framework). Included in the Framework document are interim criteria for vegetation management on levees, which will be followed while the Central Valley Flood Protection Plan (CVFPP) is being developed. The CVFPP is a system-wide strategic plan for flood risk reduction in the Central Valley (scheduled for completion in July 2012) that would occur over several decades as funding allows.

The Framework has interim criteria that are currently being implemented for vegetation control on levees, which include requirements for tree branches (but not trunks) to be trimmed up to 5 ft (1.52 m) above the base and sides of the levee, and up to 12 ft (3.6 m) above the top of the levee. The interim criteria also call for enough thinning of vegetation to allow visibility and access to the levee. Thus, the interim criteria and the Framework allow properly trimmed elderberry shrubs to grow on and around levees, whereas the Corps' ETL standard vegetation guidelines (assuming no variance) currently do not.

The Framework interim criteria are in effect until the CVFPP plan is completed in 2012. It is not clear at this point whether the CVFPP will incorporate the ETL standards, the Framework interim criteria, or some other set of standards collaboratively developed by the agencies involved. Accordingly, the effect of the Framework document is to allow more vegetation to remain in place than would the ETL guidelines. Neither the Framework nor the ETL guidelines are currently structured to accommodate extensive riparian restoration that potentially could enable the valley elderberry longhorn beetle to be restored to river reaches from which it currently is absent due to lack of habitat. Therefore, where such additional vegetation may be deemed appropriate to benefit the beetle, a variance would be required.

The Framework identified a deadline of November 1, 2010, for Local Maintaining Agencies (LMAs) to be in compliance with the Framework interim criteria. The Department of Water Resources conducts levee inspections twice a year, and reported that 86 of the 106 LMAs (81 percent) were in compliance with the interim criteria by the deadline (Eckman 2010, pers. comm.). Thirteen LMAs report they will not comply, and seven report they may comply. The most common reasons for not complying and for uncertainty about complying include cost, impact minimization requirements, and inconsistencies between agencies and issues relating to presence of elderberry shrubs. Thus, elderberry shrubs may persist in a portion of the 9 percent of LMAs where compliance is uncertain for a temporary and undetermined time period in part because some landowners or agencies think permits to cut or remove elderberries are difficult to obtain and they will be required to compensate for loss and damage. Additionally, landowners view the process of obtaining a permit to cut and remove elderberry as time-consuming. Currently, compliance with the interim criteria would result in impact minimization or compensation measures for any elderberry branches or shrubs removed, in accordance with the Service's conservation and mitigation guidelines (Service 1996, pp. 3, 4; Service 1999a, pp. 3, 4). These beneficial measures would no longer be required if the beetle is delisted.

Based on data compiled by the Department of Water Resources during their levee inspections (Eckman 2010, pers. comm.), about 91 mi (146 km) of the total 1,600 mi (2,575 km) of levees (6 percent) do not meet the Framework interim criteria requiring trimming of branches and thinning of brush. About 111 elderberry shrubs were estimated to be present on 2.5 miles (4 km) of those 91 miles (146 km), which is less than one percent of the total length of the levees (Eckman 2010, pers. comm.). Most, if not all, of the levee system locations are within the 26 locations described in Tables 1 and 2 of this proposed rule. Near-term impacts to remaining beetle habitat as a result of maintenance needed to comply with the Framework and interim criteria are considered relatively small compared to the suppression of vegetation from maintenance throughout the entire flood control system.

In summary, maintenance of the existing levee and flood protection facilities, ongoing projects, and potential future flood control activities or projects may include direct impacts in the form of temporary or permanent losses of existing riparian vegetation (including any associated elderberry shrubs and valley elderberry longhorn beetles). In some cases, there may also be permanent loss of riparian vegetation

from placement of hard rock bank protection that also precludes future restoration of beetle habitat. However, various interim measures are currently in place (i.e., the Framework document and its associated criteria) that limit further losses of riparian vegetation across the subspecies' range until the CVFPP is completed in 2012.

Flood control elements dominate the river systems that encompass most of the valley elderberry longhorn beetle's range in the Central Valley proper, measuring in the hundreds of miles and millions of linear feet of river bank. It is our judgment that the effect of flood control and associated land-uses resulting from this flood control on the beetle has been significant at certain localities in terms of habitat quantity, spatial distribution, and connectivity. Despite the increased number of occurrences of the subspecies and its larger range than was previously known, this range encompasses a number of other maintained floodways for which protections of beetle habitat have not been established. Levee and flood protection activities (both maintenance and new construction) remain an ongoing threat at some of the largest beetle locations or major portions thereof (such as the Sacramento and San Joaquin Rivers). Maintenance of these floodways can conflict with the recovery need to establish or protect riparian vegetation. Further, this maintenance can preclude opportunities to establish greater connectivity between beetle populations. Finalization of the CVFPP, the PGL, and implementation of the ETL will influence the nature and magnitude of impacts to riparian vegetation from flood control activities and the locations and size of potential riparian restoration throughout Central Valley streams and floodways.

Road Maintenance and Dust

The Recovery Plan for the valley elderberry longhorn beetle, section 7 biological opinions, and research results have identified roads and trail maintenance, and potentially dust, as threats capable of lowering the quality of valley elderberry longhorn beetle habitat (Service 1984, p. 41; Service 2002, p. 3; Huxel *et al.* 2003, p. 458). Machinery used in road maintenance activities can crush nearby elderberry shrubs, or stress them by compacting soil and raising dust. When dust is at moderate levels (defined as the amount occurring as a result of heavy vehicle traffic), it does not directly or indirectly affect the occupancy of shrubs by the beetle, although research results show a weak correlation with elderberry shrub stress symptoms (Talley *et al.* 2006b, p. 653). In contrast to this weak correlation, Talley *et al.* (2006b, p. 647) also found that the distribution of elderberry shrubs along the American River Parkway was not negatively affected by the proximity to dirt surfaces, and that the presence of the beetle was neither positively nor negatively affected by the low amount of dust produced by normal parkway use. Currently available data indicate that road and trail maintenance activities are evident at only five locations in the north and south Central Valleys (including the Feather River, Lower American River, Upper American River vicinity, Kern River, and Caliente Creek).

There is no evidence to suggest that the proximity of conservation sites adjacent to dirt or paved trails and low-traffic roadways results in detrimental effects to the valley elderberry longhorn beetle or its habitat, as long as dust levels do not exceed the low levels found in the study (Talley *et al.* 2006b, p. 655). Although a rangewide study on the effects of dust has not been conducted, the amount of dust-causing traffic adjacent to beetle habitat elsewhere in the range of the beetle is expected to be low and occur only intermittently.

Climate Change

Consideration of climate change is a component of our analyses under the Act. In general terms, ''climate'' refers to the mean and variability of various weather conditions such as temperature or precipitation, over a long period of time (e.g. decades, centuries, or thousands of years). The term ''climate change'' thus refers to a change in the state of the climate (whether due to natural variability, human activity, or both) that can be identified by changes in the mean or variability of its properties and that persists for an extended period—typically decades or longer (Intergovernmental Panel on Climate Change (IPCC) 2007a, p. 78).

Changes in climate are occurring. The global mean surface air temperature is the most widely used measure of climate change, and based on extensive analyses, the IPCC concluded that warming of the global climate system over the past several decades is ''unequivocal'' (IPCC 2007a, p. 2). Other examples of climate change include substantial increases in precipitation in some regions of the world and decreases in other regions (for these and other examples, see IPCC 2007a, p. 30; Solomon *et al.* 2007, pp. 35–54, 82–85). Various environmental changes are occurring in association with changes in climate (for global and regional examples, see IPCC 2007a, pp. 2–4, 30–33; for U.S. examples, see Global Climate Change Impacts in the United States by Karl *et al.* 2009, pp. 27, 79–88).

Most of the observed increase in global average temperature since the mid-20th century cannot be explained by natural variability in climate, and is very likely due to the observed increase in greenhouse gas concentrations in the atmosphere as a result of human activities, particularly emissions of carbon dioxide from fossil fuel use (IPCC 2007a, p. 5 and Figure SPM.3; Solomon *et al.* 2007, pp. 21–35). Therefore, to project future changes in temperature and other climate conditions, scientists use a variety of climate models (which include consideration of natural processes and variability) in conjunction with various scenarios of potential levels and timing of greenhouse gas emissions (such as Meehl *et al.* 2007 entire; Ganguly *et al.* 2009, pp. 11555, 15558; Prinn *et al.* 2011, pp. 527, 529).

The projected magnitude of average global warming for this century is very similar under all combinations of models and emissions scenarios until about 2030. Thereafter, the projections show greater divergence across scenarios. Despite these differences in projected magnitude, however, the overall trajectory is one of increased warming throughout this century under all scenarios, including those which assume a reduction of greenhouse gas emissions (Meehl *et al.* 2007, pp. 760–764; Ganguly *et al.* 2009, pp. 15555–15558; Prinn *et al.* 2011, pp. 527, 529). Some of the IPCC's other key global climate projections, which they expressed using a framework for treatment of uncertainties (such as ''very likely'' is greater than 90 percent probability; see Solomon *et al.* 2007, pp. 22–23) include the following: (1) It is virtually certain there will be warmer and more frequent hot days and nights over most of the earth's land areas; (2) it is very likely there will be increased frequency of warm spells and heat waves over most land areas; (3) it is very likely that the frequency of heavy precipitation events, or the proportion of total rainfall from heavy falls, will increase over most areas; and (4) it is likely the area affected by droughts will increase, that intense tropical cyclone activity will increase, and that there will be increased incidence of extreme high sea level (IPCC 2007b, p. 8, Table SPM.2).

Various types of changes in climate can have direct or indirect effects on species, and these may be positive or

negative depending on the species and other relevant considerations, including interacting effects with habitat fragmentation or other non-climate variables (such as Franco *et al.* 2006; Forister *et al.* 2010; Galbraith *et al.* 2010; Chen *et al.* 2011). Scientists are projecting possible impacts and responses of ecological systems, habitat conditions, groups of species, and individual species related to changes in climate (such as Deutsch *et al.* 2008; Berg *et al.* 2009; Euskirchen *et al.* 2009; McKechnie and Wolf 2009; Sinervo *et al.* 2010; Beaumont *et al.* 2011). These and many other studies generally entail consideration of information regarding the following three main components of vulnerability to climate change: exposure to changes in climate, sensitivity to such changes, and adaptive capacity (IPCC 2007, p. 89; Glick *et al.* 2011, pp. 19–22). Because aspects of these components can vary by species and situation, as can interactions among climate and non-climate conditions, there is no single way to conduct our analyses. We use the best scientific and commercial data available to identify potential impacts and responses by species that may arise in association with different components of climate change, including interactions with non-climate conditions as appropriate.

Projected changes in climate and related impacts can vary substantially across and within different regions of the world (such as IPCC 2007a, pp. 8–12). Thus, although global climate projections are informative and in some cases are the only or the best scientific information available, to the extent possible we use ''downscaled'' climate projections, which provide higher-resolution information that is more relevant to the spatial scales used to assess impacts to a given species (see Glick *et al.* 2011, pp. 58–61 for a discussion of downscaling). With regard to our analysis for the valley elderberry longhorn beetle, downscaled projections of climate in California are available.

Global climate change may have significant effects on plant species distributions in California over the next 100 years (Loarie *et al.* 2008, pp. 1, 3–5), and thus has the potential to negatively impact the valley elderberry longhorn beetle. Likely direct impacts of climate change in the region over that timeframe include an increase in annual mean temperatures ranging from 3.1 to 4.3 degrees Centigrade (C) (5.5 to 7.8 degrees Fahrenheit (F)) under assumptions geared to produce medium-level warming scenarios (Cayan *et al.* 2006, p. 38). However, one of the elderberry species on which the beetle depends (*Sambucus mexicana*) is well adapted to warm temperatures, and extends its range into southern California and northern Mexico (Crane 1989, p. 2; Dempster 1993, p. 3). Higher temperatures are also not expected to produce large changes in total precipitation in California (Cayan *et al.* 2006, p. 39), although more precipitation is expected to fall in the nearby Sierra Nevada mountains as rain rather than snow, thereby lessening summer water availability in snowpack-dominated watersheds (Kapnick and Hall 2010, pp. 3446, 3448, 3454; van Mantgem *et al.* 2009, p. 523). Effects of climate change on the beetle, other than on habitat and plant species distribution, are mentioned below (Factor E).

Average temperatures have been rising in the Central Valley of California, and this trend will likely continue because of climate change. Climate change may also affect precipitation and the severity, duration, or periodicity of drought. However, there is a great deal of uncertainty as to the rate at which the average temperature may increase, and the effect of climate change on both precipitation and drought. In addition to the uncertainty associated with how the overall climate of the Central Valley may change, the impact of climate change on the valley elderberry longhorn beetle will depend on a complex array of other factors, including how the subspecies and its habitat respond to climate change. We know that one of the elderberry species on which the beetle depends is well adapted to warm temperatures, and extends its range into southern California and northern Mexico. We are not aware of information that would allow us to make a meaningful prediction that potential changes in temperature and precipitation patterns would significantly affect elderberry growth, or whether such changes may cause shifts in the timing of elderberry flowering relative to beetle emergence, or affect the relationship of these two species in any other way.

Conservation—Habitat Restoration and Protection

Estimates of Valley Elderberry Longhorn Beetle Conserved Areas

Former Estimate

The amount of riparian vegetation and associated beetle habitat considered conserved has been revised since our 5-year review (Service 2006a). According to the estimate used in our 5-year review, since the valley elderberry longhorn beetle was listed in 1980, approximately 45,000 ac (18,211 ha) of existing riparian vegetation had been acquired or protected (Talley *et al.* 2006a, pp. 46–47), which is approximately 34 percent of the 132,586 ac (53,656 ha) of riparian vegetation estimated to remain in the Central Valley in 2003 (Geographic Information Center 2003). This estimate did not include the American River Parkway, much of which was considered protected at the time of listing, nor does it include protected areas established in accordance with the Service's guidelines under section 7 consultations (Service 1996, pp. 3, 4; Service 1999a, pp. 3, 4).

The estimate of 45,000 ac (18,211 ha) of acquired or protected habitat includes 6,600 ac (2,671 ha) of land in the San Joaquin River NWR, and assumes these lands could support the valley elderberry longhorn beetle under favorable management (Talley *et al.* 2006a, p. 47). However, most of the Refuge acreage is low in elevation and subject to flooding for longer periods than elderberry shrubs can survive (Griggs 2007, pers. comm.). As discussed below, numerous recently planted elderberry shrubs within this portion of the San Joaquin River NWR died due to flooding in 2006. Only about 120 ac (49 ha) of the 6,600 ac (2,671 ha) of the San Joaquin River NWR mentioned by Talley *et al.* (2006a, p. 47) are likely capable of supporting the beetle.

Some existing areas that are protected and currently provide a benefit to the valley elderberry longhorn beetle were not yet established at the time that Talley *et al.* (2006a, Table 2.3.1.1, p. 47) conducted an analysis of acquired or protected beetle habitat. For example, the Kern River Preserve (1,000 ac (405 ha)) was not yet established. Additionally, other currently protected areas acquired prior to listing were outside the known range of the beetle at the time of listing, such as the Bobelaine, Feather River Wildlife Area (2,900 ac (1,174 ha)). Other significant areas mentioned in Table 2.3.1.1 of Talley *et al.* (2006a, p. 47) could have some benefit to the beetle in a portion of the sites due to the mosaic of habitat types that are known to occur between wetland and upland areas (such as at the Consumnes River Preserve, 5,500 ac (2,226 ha)). Finally, the table did not specify areas where the beetle would benefit from conservation easements of 23+ mi (37+ km) of river frontage. In its proper context, Table 2.3.1.1 in Talley *et al.* (2006a, p. 47) was never intended as an estimate of protected beetle habitat, but rather, a list of some of the major habitat acquisition and protection efforts in the Central Valley that

contained some component of riparian vegetation with potential to benefit the beetle (Talley *et al.* 2006a, p. 46). Based on this interpretation, we do not use—or discuss—the 45,000-ac (18,211-ha) figure further in this proposed rule.

Current Estimate

For this proposed rule, we constructed a GIS database from several sources to provide a range of estimates of the current amount and distribution of protected riparian vegetation (which may or may not contain elderberry shrubs) in the range of the valley elderberry longhorn beetle, and the amount of beetle habitat restored or created. For reference and as stated previously in the ''Lost Historical Range'' section, 132,586 ac (53,656 ha) of riparian vegetation remained across the Central Valley in 2003 (Geographic Information Center 2003). Current range estimates are as follows:

(1) Protected Riparian Vegetation—Areas of land within the range of the beetle that is either subject to a conservation easement, is riparian land managed and held in fee by CDFG, or public land known to be managed for conservation (such as Cosumnes River Preserve). The amount of such protected riparian vegetation is 21,536 ac (8,715 ha). We used a GIS-layer of riparian vegetation from the Department of Water Resources to obtain this estimate.

(2) Restored Riparian Vegetation—Areas of predominantly Federal and State lands of any riparian type, including both beetle habitat and general riparian combined (approximately 13,000 ac (5,261 ha)).

(3) Restored Beetle Habitat—Areas with elderberry plantings and partially overlapping restoration lands where these have been planted, including various mitigation banks and excluding approximately 1,600 ac (648 ha) not yet planted. This estimate is approximately 12,400 ac (5,018 ha).

Each of these estimates should be interpreted with caution. The riparian vegetation GIS layer may include areas too wet for elderberry to grow, and may exclude small fragments, or some adjacent lands, where elderberry or other riparian could potentially grow. For the elderberry plantings total (with the exception of transplantings and plantings near occurrences), some elderberry has been planted too recently to expect the plants to be occupied by the valley elderberry longhorn beetle because occupancy increases as a function of time, particularly after 7 years (River Partners 2004a, p. 4). Some restoration has not been successful as noted above, and some is within mitigation banks intended to offset losses of beetle habitat elsewhere. Finally, there is significant, albeit incomplete, overlap among these riparian vegetation estimates.

Discussion of Valley Elderberry Longhorn Beetle Conserved Areas

Eight agencies and private organizations have completed 26 projects to enhance or restore 4,950 ac (2,003 ha) by planting elderberry (Talley *et al.* 2006a, pp. 46–49). Most of these elderberry-specific restoration efforts are located within already protected riparian vegetation discussed above.

The largest effort to protect and restore beetle habitat (through elderberry plantings) is that at the Sacramento River NWR. Valley elderberry longhorn beetle habitat on this refuge currently totals more than 2,400 ac (974 ha). The Sacramento River NWR was established in 1989, with a focus on conserving the beetle as well as other native riparian species (Service 2006a, p. 9). Over 100,000 elderberry seedlings or transplanted shrubs have been planted at the refuge (Talley *et al.* 2006a, p. 51). If any significant number of elderberry shrubs were lost at this Refuge, they would be replanted as described in the Sacramento River NWR Comprehensive Conservation Plan (CCP), which identifies conservation of the beetle as one of its management goals (Service 2005, pp. 1–37). These areas are considered fully protected.

Unfortunately, in 2006, elderberry shrubs that had been planted on approximately 765 ac (310 ha) in the San Joaquin River NWR and 35 ac (14 ha) in the Mohler Tract of the Stanislaus River died due to flooding (Griggs 2007, pers. comm.; River Partners 2007, p. 47). The San Joaquin River NWR responded by planting elderberry on about 120 ac (49 ha) of higher elevation land. Additionally, drought at the San Luis and Merced National Wildlife Refuges killed all but about 100 elderberry shrubs out of the 250 ac (101 ha) planted at those sites (Woolington 2007, pers. comm.). The remaining total areas of restored valley elderberry longhorn beetle habitat (roughly 4,000 ac (1,619 ha), or the total restored acreage (4,950 ac) (2,003 ha)), less the 765 ac (310 ha) on San Joaquin NWR and 250 ac (101 ha) at San Luis/Merced NWR, are likely to remain viable for the beetle into the foreseeable future, as evidenced by the fact that the elderberry shrubs survived the flooding and droughts discussed above.

Seven agencies and private organizations have completed, or are completing, 19 projects restoring or enhancing riparian vegetation totaling approximately 1,592 ac (644 ha), but no elderberry are being planted at these sites (Talley *et al.* 2006a, pp. 48–51). Over time, elderberry shrubs should naturally colonize riparian sites, as elderberry seeds are dispersed by many bird species that nest, forage, or transit riparian areas. A number of these restoration and enhancement projects (River Partners 2003, p. 4; 2004b, p. 4) may provide incidental benefits to the valley elderberry longhorn beetle by encouraging natural elderberry colonization of restored areas (Howe and Smallwood 1982, p. 216; NRCS 2006, p. 4).

Currently, of the 26 known locations of valley elderberry longhorn beetles, 4 include a significant component of well-protected lands with known beetle habitat mainly as State or Federal wildlife areas (Bear River, Cosumnes River, Feather River, Sacramento River), and portions of 6 others contain some well-protected lands (Stony Creek, Big Chico Creek, Butte Creek, Tuolumne River, Kaweah River, and San Joaquin River). The extent of protection and success as beetle habitat along the San Joaquin River is somewhat less than the others. Seven locations (Lower American River, Big Chico Creek, Putah Creek, Lower Stanislaus River, Kings River, Upper Stanislaus Hills, and portion of the Kaweah River upstream of Lake Isabella) are managed for natural and open space values, or are partially on city parks and Forest Service lands, where the land and management status protects against urban development, but with no specific protections for the beetle or elderberry shrubs in particular. The remaining locations or portions of the remaining locations are on lands without protections or are not known to have protections, some of which are private lands or designated floodways that may experience activities that affect elderberries (primarily through vegetation suppression from bank protection and vegetation removal on levees and within floodway channels). This includes (but is not limited to) some sections of the Sacramento River from Colusa to the American River confluence, portions of Big Chico and Butte Creeks, parts of the Feather, American, and Bear Rivers, Thomes Creek, Yuba River, former portions of Ulatis Creek (now a flood channel), Cache Creek, Upper Stanislaus Hills, the Calaveras River-Stockton Diverting Canal, Mokelumne-Bear Rivers, Merced River, Kings River, Tule River-Deer Creek, Kern River, and Caliente Creek.

Some locations (or portions thereof) on private lands throughout the Central Valley, despite lack of formal protections, are deemed less likely to be impacted due to the remote or rural

nature of the locations, or sometimes topography, that currently limits the threats of agriculture and urban development. The potential of future threat at these private ownership locations is unknown. These less threatened private areas include: Ulatis-Green Valley Creeks, Cache and Putah Creeks, portions of the Mokelumne and Calaveras Rivers, the Kaweah River upstream of Lake Isabella, Upper Stanislaus Hills, portions of the upper American River vicinity (i.e., between the north and south forks, but not northwest), and Caliente Creek. Of these, the Mokelumne location has a safe harbor agreement with limited participation at this time. It should be noted that the threat of habitat loss from development in these areas, while reduced, is not necessarily eliminated, and it is reasonable to anticipate some future loss. Some habitat losses have occurred in some of these remote sites, such as Upper Stanislaus Hills, and Ulatis-Green Valley Creeks, due to recent light residential or ranchette development.

In the south Central Valley, the occupied locations immediately south of Sacramento to Stanislaus County have a good potential to support populations of valley elderberry longhorn beetles; however, there are limited protections for this existing habitat. For example, the Cosumnes River Preserve covers only a portion (perhaps 20 percent of its length) of the Cosumnes River, but beetle records and habitat are largely outside of the Preserve. Much of the riparian area along the Cosumnes, Mokelumne, and Stanislaus Rivers, which appears on aerial photos as intact riparian vegetation, is privately owned and to our knowledge does not have protection. Additionally, most locations in the southern portion of the subspecies' range (as compared to the north Central Valley) harbor fewer occurrences in general, and display lower quality riparian vegetation (both major rivers and tributaries, particularly on the valley floor). Therefore, persistence and conservation of the valley elderberry longhorn beetle in the central and especially the northern portion of its range may provide more consistent support of the subspecies as a whole, both currently and in the foreseeable future. The likelihood of persistence of the subspecies is considered fair, average, or good at all south Central Valley locations with the exception of three locations that are uncertain due to lower quality beetle habitat and absence of protections as compared to the north Central Valley. Additionally, in some south Central Valley areas where there is protected beetle habitat (Kings and San Joaquin Rivers), the subspecies has not been observed despite recent surveys.

Examples of protected lands in the southern Central Valley include about 5,500 ac (2,226 ha) of floodplain habitat suitable for the valley elderberry longhorn beetle in the Cosumnes River Preserve (Talley *et al.* 2006a, p. 47) and the San Joaquin River Parkway, which is being built in Fresno and Madera Counties as a result of Federal, State, and local efforts, including efforts at the San Joaquin NWR. As of May 2008, the San Joaquin River Parkway project has protected approximately 2,218 ac (898 ha) of riparian lands from future development (San Joaquin River Conservancy 2008, p. 1). Protected parkway land currently includes the entirety of one known beetle occurrence and overlaps the southern edge of a second (Greeninfo Trust 2007, p. 1; CNDDB 2010a, pp. 118, 119).

Conservation Through Section 7 Consultations and Section 10 Habitat Conservation Plans

The Service has developed conservation guidelines to promote restoration and protection of valley elderberry longhorn beetle habitat (USFWS 1996, 1999a). Subsequent to the development of these guidelines, proponents of projects resulting in authorized habitat loss often conduct habitat restoration for the valley elderberry longhorn beetle as an impact minimization measure (Service 1996 pp. 3, 4; Service 1999a, pp. 3, 4). Since the 1996 and revised 1999 guidelines were implemented, the number of restoration and protection actions for beetle habitat has dramatically increased. As described above under the ''Agricultural and Urban Development'' section, we reviewed Federal projects for which we conducted section 7 consultations for the beetle between 1983 and 2006. We determined that the total amount of incidental take authorized amounted to roughly 10,000 to 20,000 ac (4,047 to 8,094 ha) of riparian vegetation, with actual acres lost an unknown amount less due to projects that were not implemented, and thus, for which habitat loss did not occur (Talley *et al.* 2006a, p. 34); however, this acreage range does not account for the conservation (such as restoration or protection of beetle habitat) that occurred as a result of these projects. Our files indicate that as a result of the conservation guidelines, project proponents established agreements to restore and protect (through conservation easements in perpetuity) approximately 400 to 1,900 ac (162 to 769 ha) of beetle habitat (estimated based on extrapolations of relatively limited data) (Service 2006a, p. 7) in association with section 7 consultation activities. This habitat restoration and protection is in addition to conservation efforts unassociated with incidental take (see following paragraphs in this section).

The habitat restoration and protection agreements established under the guidelines require planting and maintenance of roughly 3.5 new elderberry shoots on protected land for every elderberry stem 1 in. (2.5 cm) in diameter or greater that is removed (Talley *et al.* 2006a, p. 29). They also include requirements that would result in approximately 76 percent of elderberry shrubs being transplanted rather than destroyed by a project. Elderberry shrub transplants have resulted in successful colonizations at 88 percent of the sites to which shrubs potentially containing beetle larvae were transplanted (Holyoak *et al.* 2010, p. 49).

The degree of success of the conservation guidelines (as discussed above) has been difficult to measure because many of the required monitoring reports were unavailable to the Service and Talley *et al.* (2006a, p. 29). However, based on best estimates from available reports, the conservation measures agreed to by project proponents may have offset the loss of elderberry shrubs caused by their projects, and even resulted in a net gain of shrubs (Holyoak *et al.* 2010, p. 51). Valley elderberry longhorn beetles were present at approximately 47 percent of pre-impact sites (based on recent exit holes), and have colonized approximately 43 percent of the restored and protected sites established as a result of consultations under section 7 of the Act (Holyoak *et al.* 2010, pp. 49, 50). Establishment of additional sites specifically designed to compensate for take of the beetle would cease if the beetle is delisted, but existing protected sites established under these agreements would continue to remain in place following delisting of the beetle, and compensation for riparian vegetation losses could likely continue in some circumstances.

Valley elderberry longhorn beetle habitat has also been protected or restored through the provisions of section 10 of the Act. Habitat conservation plans prepared for the beetle to offset the effects of a project, through some combination of habitat restoration and protection transplanting of occupied elderberry shrubs to a protected location, are accompanied by

a management plan that benefits the beetle. Twenty incidental take permits have been issued, totaling roughly 5,353 ac (2,166 ha) of incidental take authorized; the majority of these minimally impacted the beetle or its habitat.

Five conservation banks containing protected beetle habitat have been authorized to sell credits for the beetle as needed for project impacts associated with either section 7 or 10 of the Act. These banks protect approximately 242 ac (98 ha) of existing, restored, or created habitat for the beetle in Placer, Shasta, San Joaquin, Sacramento, and Yolo Counties (Talley 2006a, p. 55). A sixth bank in Yolo County supports some elderberry shrubs, but is not authorized to sell credits for the beetle.

Since 1996, our conservation and mitigation guidelines under sections 7 and 10 of the Act have required project proponents to establish preserves and conservation easements for the valley elderberry longhorn beetle to minimize the impacts of projects that may incidentally take beetles (Service 1996, p. 6; Service 1999a, p. 6). These protected areas of habitat total approximately 642 to 1,900 ac (260 to 769 ha), which are in addition to areas that have been restored for the beetle, all of which is described in further detail under the ''Current Estimate'' section above.

Summary of Factor A

Since the mid-1800s, riparian vegetation has been impacted throughout the Sacramento and San Joaquin Valleys as a result of agricultural and urban development, and associated flood control activities. At the time of listing, habitat loss was identified as one of the most significant threats to the valley elderberry longhorn beetle (45 FR 52805, August 8, 1980; Eng 1984, pp. 916–917). These impacts are expected to continue to affect the beetle as a result of some additional riparian vegetation (and specifically beetle habitat) loss across the subspecies' range. Cumulatively, this riparian vegetation loss and associated beetle habitat loss may limit the overall amount of beetle habitat, and in some cases cause the loss of connectivity between beetle locations. However, when examining the potential rangewide impacts across the subspecies' known current range that is now known to be greater in size than at the time of listing, we believe that those impacts are of a lower magnitude to the subspecies as a whole due to there being significantly more locations known today (26 locations), including protected areas, as compared to the level of impacts affecting the 3 locations known at the time of listing.

Agricultural and urban development (including activities that impact vegetation that grows along existing irrigation channels, levees, etc.) throughout much of the range of the valley elderberry longhorn beetle is likely to continue to have some effect on the subspecies and its habitat.

The flood protection system throughout the valley elderberry longhorn beetle's range is fairly extensive, impacting most of the rivers or creeks where beetle occurrences are known. Many dams or other flood protection facilities (such as levees) predate listing of the beetle, but require ongoing maintenance or improvements currently and into the future, such as improvement projects completed through the Corps. Construction and maintenance of these flood protection and associated reservoir flood control facilities have resulted in direct losses of riparian vegetation within project impact areas, and indirect impacts in surrounding riparian vegetation areas, due to agricultural and urban development resulting from flood protection.

Although ongoing and future maintenance of levees, channels, and other facilities will likely result in future losses of valley elderberry longhorn beetle habitat at some locations, these impacts are currently limited by interim protection measures. The Corps has established a procedure for seeking a variance from the ETL (which can result in vegetation-free zones within riparian areas when implemented). Variances may be issued to provide opportunities for beetle habitat to remain. Also, the *California's Central Valley Flood System Improvement Framework* document is under development. Until this is finalized in 2012, interim criteria are being implemented that provide protection measures for beetle habitat. As a result of the Framework document and interim criteria, impacts to remaining beetle habitat along the majority of levees throughout the subspecies' range are likely to be insignificant in the near term. However, long-term effects are unknown as implementation of the ETL and variance process have not yet been finalized.

The Recovery Plan for the valley elderberry longhorn beetle, section 7 biological opinions, and research results have identified road or trail maintenance, and potentially dust, as threats capable of lowering the quality of valley elderberry longhorn beetle habitat (Service 1984, p. 41; Service 2002, p. 3; Huxel *et al.* 2003, p. 458). However, recent studies have determined that as long as dust levels remain low, neither road maintenance, trail maintenance, nor dust appear to harm beetle populations or elderberry shrubs.

Although an unknown amount of habitat for the valley elderberry longhorn beetle has been lost since the time of listing, we now know that the range of the beetle is larger than was previously known. About 21,536 ac (8,715 ha) of lands containing riparian vegetation have been preserved, enhanced, or restored by many agencies and organizations across the subspecies' current range. This is a fraction of the roughly 132,586 ac (53,656 ha) of riparian vegetation (not necessarily all containing elderberry shrubs) estimated to remain in the Central Valley in 2003 (our most recent estimate) (Geographic Information Center 2003, p. 14). These estimates include approximately 18,000 ac (7,284 ha) of Central Valley Joint Venture conservation easements, approximately 13,000 ac (5,261 ha) of restoration lands predominantly on Federal and State areas, and approximately 12,400 ac (5,018 ha) of lands with elderberry plantings (the latter of which partially overlaps restoration lands, such as mitigation banks, and excludes approximately 1,600 ac (648 ha) that has not yet been planted). We note that each of these estimates should be interpreted with caution; only a portion of these conservation easements or restoration lands actually support riparian vegetation that could contain elderberry, or are dedicated specifically to elderberry plantings.

Habitat and valley elderberry longhorn beetle protection measures are also associated with section 7 consultations and mitigation occurring as a result of section 10 habitat conservation plans. Since the 1996 and revised 1999 guidelines were implemented, the number of restoration and protection actions that have occurred to benefit the beetle have dramatically increased. To date, project proponents have restored and protected (through conservation easements in perpetuity) approximately 642 to 1,900 ac (260 to 769 ha) of beetle habitat.

Finally, another large protected riparian area that provides habitat for the beetle is the 4,600-ac (1,862-ha) American River Parkway (Parkway) in Sacramento County, which includes important habitat for the beetle, part of which was designated critical habitat (45 FR 52803; August 8, 1980) (see *Recovery Planning and Implementation,* ''Primary Interim Objective 1'' above).

There is uncertainty as to the effect of climate change on precipitation and the severity, duration, or periodicity of drought in the Central Valley. The impact of climate change on the valley elderberry longhorn beetle will depend on many factors, including how the subspecies and its habitat respond to such change. We are not aware of information that would allow us to make a meaningful prediction that potential changes in temperature and precipitation patterns would significantly affect elderberry growth.

Overall, we consider the current and future impacts of habitat loss on the valley elderberry longhorn beetle to be different today than at the time of listing. There are a greater number of locations within the range of the subspecies (26 locations) known now compared to the time of listing (3 locations), and there have been conservation actions and protections at portions of those additional locations. Of the 26 known locations, all or portions of 10 are on State or Federal wildlife areas or other areas under conservation easement, and all or portions of 6 are partially on city parks or Forest Service lands, where the particular threat of habitat loss is reduced, but other threats from human use remain. All or portions of 7 other locations throughout the Central Valley include private lands where (despite lack of formal protections) threats are presently reduced due to their remote or rural nature, or due to topography that limits the more pervasive threats of agricultural and urban development. The majority of locations contain some lands without protections, some of which are private or designated as floodways that could experience activities that affect beetle habitat. These unprotected locations encompass most of the range of the subspecies, including riparian zones in major drainages. Therefore, we conclude that agricultural and urban development, levees, and flood control protection remain threats to the valley elderberry longhorn beetle now, and likely into the future, although these threats are not considered significant when taken within the context of the increased number of occurrences known today as compared to the time of listing.

Factor B. Overutilization for Commercial, Recreational, Scientific, or Educational Purposes

Collecting all species of longhorn beetles is popular among amateur entomologists. However, we are not aware of any evidence that commercial use or private trade of the valley elderberry longhorn beetle has been, or is, a threat. We did not identify collecting or overutilization for any purpose as a threat to the beetle in the final listing rule or the Recovery Plan. Therefore, based on our review of the available scientific and commercial information, overutilization for any purpose is not currently considered a threat, and is not anticipated to emerge as a threat in the future.

Factor C. Disease or Predation

At the time of listing in 1980, we did not consider disease or predation as significant threats to the valley elderberry longhorn beetle. Given the available scientific and commercial information on the beetle, disease is not considered a threat. Since listing, however, several insect predators have been identified as potential threats to the beetle.

Predation

The invasive, nonnative Argentine ant (*Linepithema humile*) has been identified as a potential threat to the valley elderberry longhorn beetle (Huxel 2000, pp. 83–84). This ant is both an aggressive competitor with, and predator on, several species of native fauna, and is spreading throughout California riparian areas and displacing assemblages of native arthropods (Ward 1987, pp. 10–15; Holway 1995, pp. 1634–1637; Human and Gordon 1997, pp. 1243–1247; Holway 1998, pp. 254–257). The best available data indicate that Argentine ants are evident at approximately five locations in the north Central Valley (i.e., Sacramento River-Redding to Red Bluff, Sacramento River Red Bluff to Chico, Feather River, Lower American River, and Putah Creek) and 3 locations in the south Central Valley (i.e., Lower Stanislaus River, Merced River, and Tule River-Deer Creek).

The Argentine ant requires moisture, and may thrive in riparian or irrigated areas (Holway and Suarez 2006, p. 321). A negative association between the presence of the ant and valley elderberry longhorn beetle exit holes was observed along Putah Creek in Yolo and Solano Counties in 1997, causing the author to conclude that the spread of Argentine ants along permanent streams would likely have a significant impact on the long-term persistence of the beetle (Huxel 2000, pp. 83–84). Although Huxel's (2000) survey did not distinguish whether the observed negative association is due to direct effects of the ant on the beetle, or simply a result of different habitat preferences between the two species, a follow-up study (Klasson *et al.* 2005, pp. 7, 8) found that Argentine ants tend to co-occur with the beetle on elderberry shrubs, and noted this was likely because both are attracted to the habitat provided by the shrub. The authors concluded that there were likely to be threshold densities of Argentine ants below which beetle populations could remain relatively unaffected, but they did not suggest what those densities might be. However, they did note that impact minimization and mitigation sites established for the beetle tended to have the highest densities of Argentine ants. It is possible that the ants may be imported on seedlings from nurseries, with irrigation of these impact minimization or mitigation areas potentially providing a dependable moisture source for the ant colonies.

A recently submitted preliminary report for a survey conducted 12 years after the survey reported by Huxel (2000) found that the valley elderberry longhorn beetle does continue to occupy at least three of six locations along Putah Creek (Holyoak and Graves 2010, p. 23). The same preliminary report suggests that the average number of recent beetle exit holes per elderberry shrub is lower for shrubs with Argentine ants (Holyoak and Graves 2010, p. 17). The authors did not conclude that this apparent difference was statistically significant, however, and noted that because the beetle is found at such low densities, sampling must be extensive to statistically confirm population declines as serious as 50 percent or higher (Holyoak and Graves 2010, p. 20). The study found Argentine ants to be present on 13 percent of shrubs overall, and present in 7 of 10 watersheds sampled from across the range of the beetle (Putah Creek, and American, Feather, Sacramento, Merced, Stanislaus, and Tule Rivers; Holyoak and Graves 2010, p. 16). This aggressive ant may potentially interfere with adult mating or feeding behavior, or prey on larvae (Way *et al.* 1992, pp. 427–431), but predation on eggs would be the most likely impact (Huxel *et al.* 2003, p. 459). In Portugal, Argentine ants have become significant predators on the eggs of another cerambycid beetle, the eucalyptus borer (*Phoracantha semipunctata*), which has a similar life history to the valley elderberry longhorn beetle (Huxel *et al.* 2003, p. 459).

Invasive ants, including the argentine ants specifically, can cause severe ecological impacts, including documented threats to many other listed invertebrate species in the United States (Wagner and van Driesche 2010, p. 555). It is possible that the lack of demonstrated predation impact on the valley elderberry longhorn beetle could be due to small sample size, and similar

effects of nonnative ants on other species indicate that some effect on the beetle cannot be ruled out. However, based on our review of the best available information, particularly the co-occurrence of Argentine ants (and other ant species) and the beetle, we do not have sufficient information to demonstrate that such predation, if it occurs at all, constitutes a significant threat to the beetle.

The European earwig (*Forficula auricularia*) is a scavenger and omnivore that is often found on elderberry shrubs, and may feed opportunistically on exposed valley elderberry longhorn beetle larvae (Klasson *et al.* 2005, p. 8). Earwigs require moisture, and Klasson *et al.* (2005, p. 8) considered their densities to be higher in impact minimization or mitigation sites, due to irrigation. However, this hypothesis was not tested statistically. Klasson *et al.* (2005, p. 8) suggested that elevated earwig densities at impact minimization or mitigation sites could contribute directly to increased predation on the beetle in those areas, and could also attract lizards that could further increase predation pressure; they noted that such ideas need to be tested further. Thus, we have no information to suggest that earwig predation or presence constitutes a specific threat to the beetle.

The valley elderberry longhorn beetle is also likely prey of insectivorous birds. One study noted holes in elderberry stems created by foraging birds at nearly every site where beetle exit holes were found, suggesting that birds had been excavating holes to forage for beetle larvae in the pith (Lang *et al.* 1989, p. 246). The study also noted that beetle populations appeared to be limited at any one site by factors other than habitat availability, suggesting that predation by birds could be one such additional limiting factor (Lang *et al.* 1989, p. 246). However, we have no further information to indicate what level of impact, if any, bird predation imposes on beetle population levels.

Summary of Factor C

We have no information to indicate that the valley elderberry longhorn beetle is threatened by disease. The best available information indicates birds, lizards, European earwigs, and Argentine ants are potential predators of the valley elderberry longhorn beetle. Although predation likely causes some mortality of individual eggs, larvae, or adult beetles, we have no data that support the premise that predation is adversely affecting the subspecies as a whole. Beetles have coexisted with Argentine ants at Putah Creek and the American River Parkway for over 10 years (Huxel 2000, p. 82; Holyoak and Graves 2010, pp. 16, 17, 30), although possibly not without some decrease in average adult beetle population size, as measured by recent exit holes (Holyoak and Graves 2010, p. 17). The question of the extent to which predation by Argentine ants could be lowering adult beetle populations is potentially important because Argentine ants have been found in 7 of the 26 beetle locations, but existing evidence suggests that ants need to be present above some as yet unknown density threshold. Based on review of the best available scientific and commercial information, we do not consider disease or predation to be of such significance that it could threaten the continued existence of the beetle currently or in the future.

Factor D. Inadequacy of Existing Regulatory Mechanisms

State and Federal laws provide some degree of protection for riparian vegetation and valley elderberry longhorn beetles, as discussed below. We did not research the extent to which county or city ordinances or regulations provide direct protection for the beetle, although the subspecies may benefit from some city and county open space designations that harbor beetle habitat. The beetle may also benefit from local impact minimization or mitigation plans for special status species that have been developed as part of city or county general plans. Conversely, other types of local zoning or changes in open space designations in the future could affect the beetle. For the purposes of this discussion, we assume that there are no local laws that provide protection for the subspecies.

State Laws

The California Endangered Species Act (CESA) does not provide protection to insects (sections 2062, 2067, and 2068, California Fish and Game Code). The Swainson's hawk (*Buteo swainsoni*) and bank swallow (*Riparia riparia*) are migratory birds listed as threatened under CESA that are known to seasonally inhabit riparian areas within the beetle's range. The CESA listing of these two bird species likely affords limited incidental protection to the beetle in instances where project proponents are encouraged to minimize habitat alteration associated with development activities. However, in general, neither the Swainson's hawk nor the bank swallow inhabit the Central Valley year round. Because the CESA prohibition against take does not generally include effects to a species resulting from loss of its habitat (there is no prohibition against ''harm'' under CESA as there is under the Act), project proponents may destroy the hawk's and swallow's habitat once the birds have migrated south for the winter. In this sense, protections afforded the valley elderberry longhorn beetle by the CESA listing of these two bird species are limited and temporary.

The California Environmental Quality Act (CEQA) requires review of any project that is undertaken, funded, or permitted by the State or a local governmental agency. If significant effects are identified, the lead agency has the option of requiring mitigation through changes in the project or deciding that overriding considerations make mitigation infeasible (CEQA Sec. 21002). In the latter case, projects may be approved that cause significant environmental damage, such as destruction of wildlife species or their habitat. Species protection, including the valley elderberry longhorn beetle, through CEQA is therefore dependent upon the discretion of the lead agency.

Section 1600 of the California Fish and Game Code authorizes CDFG to regulate streambed alteration. CDFG must be notified of, and approve, any work that substantially diverts, alters, or obstructs the natural flow or substantially changes the bed, channel, or banks of any river, stream, or lake. If an existing fish or wildlife resource could be substantially adversely affected by a project, CDFG must provide the project applicant with a draft agreement within 60 days to protect the species (section 1602 of the California Fish and Game Code). However, if CDFG does not submit such a draft agreement within the required time, the applicant may proceed with the work. Mitigation under a streambed alteration agreement is entirely voluntary by a project applicant; thus, such agreements are typically only provided to applicants when the mitigation activities they identify are compatible with other mitigation activities required by another type of permit.

Section 815 of the California Civil Code establishes conservation easements as enforceable and perpetual interests in real property for purposes of retaining land in its natural state (Cal Civ Code, sections 815–815.3). Conservation easements can only be held by nonprofit environmental organizations, State or local governmental entities, or Native American tribes (Cal Civ Code, section 815.3). Conservation easements have been used to protect land for the beetle in mitigation banks and under the terms of permits granted under sections 7 and 10 of the Act. Although sections 7 and

10 would no longer protect the valley elderberry longhorn beetle if the subspecies were to be delisted, those conservation easements currently in existence would continue in perpetuity.

Federal Protections

The National Environmental Policy Act (NEPA; 42 U.S.C. 4321 *et seq.*) may provide some protection for the valley elderberry longhorn beetle to the degree its procedural requirements inform Federal agency decision-making. For activities undertaken, authorized, or funded by Federal agencies (activities with a Federal nexus), NEPA requires the lead agency to analyze the project for potential impacts to the human environment prior to implementation. If that analysis reveals significant environmental effects, the Federal agency includes a discussion of mitigation measures that could help offset those effects (40 CFR 1502.16). However, the agency need not actually implement the mitigation measures discussed. Agency actions potentially affecting the beetle and subject to NEPA review would include, but not be limited to, any Corps levee repair or restoration projects; activities affecting riparian vegetation conducted by the Bureau of Reclamation, the Bureau of Land Management, or the Environmental Protection Agency; and activities conducted by the Service within National Wildlife Refuges. In the event that the beetle is delisted, we do not anticipate substantial differences in NEPA review by Federal agencies.

Under section 404 of the Clean Water Act (CWA; 33 U.S.C. 1251 *et seq.*), the Corps regulates the discharge of dredge and fill material into waters of the United States, which include navigable waters and adjacent wetlands (33 U.S.C. 1344). In general, the term ''wetland'' refers to areas meeting the Corps criteria regarding soils, hydrology, and vegetation. Any action within the valley elderberry longhorn beetle's habitat that has the potential to impact waters of the United States is reviewed by the Corps under the CWA for a permit determination. These reviews may require consideration of impacts to riparian species (including the valley elderberry longhorn beetle), as well as mitigation of significant impacts to fish and wildlife resources. To the extent riparian vegetation and consequently beetle habitat are associated with a CWA section 404 permitting action, mitigation for those effects could be provided.

The National Wildlife Refuge System Improvement Act of 1997 (Pub. L. 105–57) establishes the protection of biodiversity as the primary purpose of the Service's National Wildlife Refuge System. This legislation lends support to various management actions to benefit the valley elderberry longhorn beetle in refuges in the Sacramento and San Joaquin Valleys, as discussed under Factor A (see ''Conservation—Habitat Restoration and Protection'' above). The Sacramento River NWR was established to conserve and manage up to 18,000 ac (7,284 ha) of riparian or floodplain vegetation from Red Bluff to Colusa in Tehama, Glenn, and Colusa Counties. The Sacramento River NWR CCP identifies conservation of the beetle as one of its management goals (Service 2005, pp. 1–37). CCPs for the San Luis and Merced National Wildlife Refuges are not yet complete. The CCP for the San Joaquin River NWR calls for surveys for the beetle, but does not call for a management plan unless ''deemed necessary'' (Service 2006b, p. 64); however, the refuge is proceeding with conservation efforts for the beetle, as discussed under the Factor A, ''Conservation—Habitat Restoration and Protection'' above. We expect conservation efforts being developed by National Wildlife Refuges in the Sacramento and San Joaquin Valley to continue to assist in conservation of the beetle.

Federally Funded Restoration Programs

The Federal Government administers a variety of programs involving grants and loans through the Natural Resources Conservation Service (NRCS) and the Service for the express purpose of promoting habitat enhancement. Some of the actions within these programs could potentially benefit the valley elderberry longhorn beetle.

The Service's Partners for Fish and Wildlife (PFW) Program works directly with private landowners to restore and enhance habitat for federally listed species on their lands through the use of small grants. However, private landowners contacted by the Service have expressed a preference not to have elderberry shrubs planted on their property (in spite of the value these shrubs provide for birds and other wildlife) due to a fear of restrictive regulations and impacts to their economic livelihood. NRCS reports that 22 of 210 easements held under its Wetland Reserve and Emergency Watershed Protection Programs support elderberries (NRCS 2011, p. 1). NRCS (2011, p. 2) indicates that elderberry plantings in its Hedgerow Planting Program are restricted to San Joaquin and Yolo Counties where safe harbor agreements are in place. Based on responses from landowners, NRCS believes that more elderberries would be planted on easements if the valley elderberry longhorn beetle were delisted. The extent that such plantings have contributed to beetle recovery could not be assessed because no spatial data or other information are available for us to assess.

Summary of Factor D

If the valley elderberry longhorn beetle is delisted as a threatened species under the Act and removed from the List of Endangered and Threatened Wildlife, the greatest impact to the beetle would be loss of the protections provided by sections 4(d) and 7(a)(2) of the Act. Under regulations established under the authority of section 4(d), the Service has prohibited the take of the beetle (50 CFR 17.31(a)). Section 7(a)(2) of the Act requires all Federal agencies to insure that any action that it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any listed species or cause the destruction or adverse modification of designated critical habitat. No other Federal or State law explicitly protects the beetle or its habitat. The Clean Water Act and National Environmental Policy Act may continue to provide incidental benefits to the beetle when riparian vegetation is impacted, but mitigation can meet the requirements of these laws without necessarily benefitting the beetle. State laws such as CESA and CEQA may continue to provide incidental protection as described above should the beetle be delisted. On the other hand, private landowners throughout the range of the beetle who participate in Federal or State riparian and other vegetation enhancement programs may be more inclined to plant elderberries on their properties.

As discussed above (Factor A), there are a number of ongoing and projected flood control actions, and vegetative maintenance of the existing flood control system, that may continue to affect valley elderberry longhorn beetle habitat, and hence the subspecies, if the beetle is removed from the List of Endangered and Threatened Wildlife. However, this relative lack of regulatory protection should be judged in light of the remaining presence of this threat.

Absent continued protection of the valley elderberry longhorn beetle under the Act, long-term protection would be most certain in areas where the subspecies currently receives some form of protection. As discussed above (see *Estimates of Valley Elderberry Longhorn Beetle Conserved Areas* section), 4 of the 26 locations of the valley elderberry longhorn beetle include a significant component of well-protected lands with

known beetle habitat, and portions of 6 others contain some well-protected lands. Seven locations (mostly in the north Central Valley) are managed for natural and open space values or are partially on city parks and Forest Service lands, where the land and management status protects against urban development, but with no specific protections for the beetle or elderberry shrubs in particular. These latter seven locations vary in extent from large sections of current habitat (such as the American River Parkway) to minor portions in parks or on Forest Service land. If the beetle were delisted, we consider the existing regulations for the beetle, coupled with the overall extent of habitat protection and restoration efforts discussed above, to sufficiently protect the beetle (i.e., ameliorate the threats) into the future in these areas. Elsewhere within the beetle's range where protections are less, the beetle's persistence ranges from fair to good (depending on the circumstances (see Table 2)), as well as uncertain at four locations (see Finding section below).

Factor E. Other Natural or Manmade Factors Affecting the Continued Existence of the Species

The final rule to list the valley elderberry longhorn beetle did not include any threats under Factor E. Since listing, we have learned that the following other factors may impact the valley elderberry longhorn beetle: climate change, pesticides, human uses other than those discussed under Factor B, small population size, and loss of beetle populations due to habitat fragmentation, which is a synergistic threat when combined with small population size (and thus a Factor E threat discussed in this section).

Climate Change

Climate change could affect the valley elderberry longhorn beetle in other ways besides the amount and distribution of habitat (see Factor A discussion on climate change above). Changes in temperature and precipitation patterns may cause shifts in the timing of elderberry flowering relative to beetle emergence, or affect the relationship of the host plant species or beetle subspecies in other ways. Talley *et al.* (2006, p. 6) believed that differences in seasonal climate between the Central Valley and coastal range encourage asynchronization of the phenology of the listed subspecies and the common subspecies. Talley *et al.* (2006, p. 15) also noted that the species (and variety) of elderberry varies with respect to drought tolerance and elevation. Therefore, it is possible that climate change could affect the beetle. The magnitude of threat of climate change to the beetle in the future cannot be assessed further at this time due to taxonomic uncertainties within the host plant genus (*Sambucus*) and lack of genetic information about the two beetle subspecies (Talley *et al.,* 2006, pp. 7, 15). Therefore, based on the best available scientific and commercial info at this time, and absent any confirming information, we conclude that climate change is not a significant factor affecting the persistence of the valley elderberry longhorn beetle.

Pesticides

Since listing, we have learned that many pesticides are commonly used within the valley elderberry longhorn beetle's range. These pesticides include insecticides (most of which are broad-spectrum and likely toxic to the beetle) and herbicides (which may harm or kill its elderberry host plants). The California Department of Pesticide Regulation (CDPR) in 1997 listed 239 pesticide active ingredients applied in proximity to locations of the beetle (Marovich and Kishaba 1997, pp. 270–275). Four of the five California Counties (Fresno, Kern, Tulare, and Madera) that have the greatest pesticide use in California are in the San Joaquin Valley (CDPR 2010, p. 1), where approximately 33 percent of beetle occurrences are documented (CNDDB 2010, pp. 1–201). Many pesticide applications likely coincide with the period when adult beetles are active, and when the beetle eggs and early larval stages occur (Talley *et al.* 2006a, p. 43). These are considered the life stages at which the beetle is most vulnerable to pesticide effects, as they occur on the outside of elderberry stems (Talley *et al.* 2006a, p. 43). The pesticides, although not applied directly to beetle habitat, may indirectly affect the beetle or its habitat if pesticides drift from nearby locations.

Although no major issues relating to drift from agricultural pesticides have been documented for riparian vegetation in general (Spotts 1989, p. 524), Barr (1991, p. 40, and citing Jones & Stokes 1987) noted yellowing of plants adjacent to cultivated fields along Middle River in San Joaquin County, and direct loss of elderberry from herbicides on the Cosumnes River. No sign of the valley elderberry longhorn beetle was observed near Middle River in 1991, although exit holes and an adult had been noted in 1984–1985 (Barr 1991, p. 27). Additionally, pesticide or herbicide use was specifically noted as a threat in 25 of 201 CNDDB records (CNDDB 2010, pp. 12, 33, 46, 86–87, 110, 114, 116, 121, 155–158, 160–165, 169, 173–174, 192–193, 195). Judging from the distribution of pesticide-affected locations identified in the CNDDB, this threat can be considered widespread, rather than localized. In most cases, however, the CNDDB notes appear to qualify the pesticide threat as one related to proximity to agricultural operations (a notable exception is CNDDB occurrence number 16, whose notes state, ''Many plants * * * were dead (herbicides) * * *.'' CNDDB 2010, p. 12). The sensitivity of valley elderberry longhorn beetles or its host plant to agricultural pesticides, and overall effect, is uncertain.

We consult with agencies on the potential effects of some pesticides on the valley elderberry longhorn beetle in the context of several national-level evaluations of pesticide effects on endangered and threatened species. For example, in 1999, the U.S. Environmental Protection Agency (EPA) entered into a section 7 consultation with the Service on the registration of 15 pesticides. In this consultation, the Sacramento Fish and Wildlife Office provided a memorandum to the Service's Region 1 Office in Portland, Oregon, regarding the use of these pesticides (Service 1999b). Our 5-year review mischaracterized the consultation (Service 2006a, p. 18), stating that a draft jeopardy opinion was prepared; however, the consultation was never completed and no jeopardy opinion was issued. In the memorandum, the Sacramento Fish and Wildlife Office provided its rationale for determining that the registration of 7 of the 15 pesticides, and their subsequent use as proposed by product labeling, would likely result in jeopardy to the beetle (Service 1999b). Service biologists noted that the primary threat to the beetle was the loss and alteration of habitat, but also noted that insecticide use and vegetation control in agricultural areas and along rights-of-way may be factors that could limit the beetle's abundance and distribution, although no data were available to allow an evaluation of potential effects (Service 1999b, pp. 77–83). Service biologists based their rationale for the draft jeopardy determinations on the beetle's small population status and the small, scattered habitat sites known at the time (Service 1999b, pp. 80–83).

Although several of the seven pesticides are still widely used in the Central Valley, the registered use of two of the seven pesticides (Bendiocarb and Fenthion) has been revoked by the EPA and the State of California (Kegley *et al.* 2008, pp. 1–46). No specific evaluation of exposure or response of the valley

elderberry longhorn beetle to any of these pesticides has been conducted.

Based on the information presented above, there is potential for agricultural pesticides to impact the valley elderberry longhorn beetle through drift in both the northern and southern Central Valley. However, the concerns expressed above were never confirmed by the Service in a final biological opinion and we otherwise lack any information confirming that pesticide use constitutes a significant threat to the subspecies.

Human Use

A number of the major occurrences of the valley elderberry longhorn beetle (such as American and Sacramento Rivers, Putah Creek, and the Feather, Stanislaus, and Kern Rivers) occur at least partially on publicly accessible areas that are subject to intended and unintended human uses, including biking (on and off-road), hiking, horseback riding, associated formal and informal trails, maintenance of such trails, camping (legal and illegal), pruning of trees (Barr 1991, pp. 40, 90–91), cutting of firewood generally, and related effects such as fires, which continue today. On September 15, 2011, for example, nine arson fires were set between River Bend and Hagan Parks in the American River Parkway. Alone or in combination with other threats, and depending on severity, these activities can, and do, kill elderberries or reduce their health (Barr 1991, pp. 40, 27, 31, 32, 92). In some cases, evidence of fire corresponds to negative surveys of beetles where they formerly occurred (such as the Merced River) (Barr 1991, p. 31). Evidence of fire is also mentioned in four CNDDB records (CNDDB 2010, pp. 70, 86, 115, 202), where it appears to be associated—in some cases—with proximity to roads and a greater perceived risk of fire associated with traffic or roadside mowing. Pruning is identified in five CNDDB records (CNDDB 2010, pp. 2, 12, 67, 99, 174), and several records identify maintenance around bike and equestrian trails (CNDDB, pp. 121, 195). Overall, Barr (1991, p. 40) found that 38 out of 230 sites showed some damage from fire or cutting.

All intended and unintended human use effects may result in incremental losses or reduction in the amount or quality of valley elderberry longhorn beetle habitat. While evidence exists of sporadic and localized impacts to elderberry bushes from human uses, such as the arsons described above, we are not aware of similar reoccurring impacts throughout the beetle's range. Thus, based on review of the best available scientific and commercial information, we do not expect losses associated with human use to be of such significance that they could threaten the continued existence of the beetle currently or in the future.

Small Population Size

Small population numbers of valley elderberry longhorn beetle host plants, and even lower numbers of occupied host plants, constitute a threat to the beetle at many locations, which, in turn, may result in small beetle population sizes. However, this potential threat can be true for many species. Additionally, Talley *et al.* (2006, p. 13) concludes that low mobility, very small local populations, and isolation of habitat patches renders beetle populations especially susceptible to extirpation with little chance of recolonization, such as was observed by Collinge *et al.* (2001) (discussed above in ''Occurrence Information and Population Size and Distribution'').

Although we do not have data from which to draw conclusions regarding the rangewide valley elderberry longhorn beetle population size, we nonetheless considered whether rarity poses a potential threat to the subspecies. While small populations are generally at greater risk of extirpation from normal population fluctuations due to impacts such as predation, disease, changing food supply, and stochastic (random) events such as fire, corroborating information regarding threats beyond rarity is needed to meet the information threshold indicating that the beetle is endangered or threatened. Many species are naturally rare and in the absence of information identifying threats to the species and linking those threats to the rarity of the species, the Service does not consider rarity alone to be a threat. Further, a species that continues to survive could be well-equipped to continue to exist into the future even if it has always had small population sizes, has always been rare, or has always been patchily distributed (as is the case for the valley elderberry longhorn beetle).

Many naturally rare species have persisted for long periods within small geographic areas, and many naturally rare species exhibit traits that allow them to persist despite their small population sizes. Consequently, the fact that a species is rare or has small populations does not necessarily indicate that it may be in danger of extinction now or in the future. We need to consider specific potential threats that might be exacerbated by rarity or small population size (or patchy distribution such as with the valley elderberry longhorn beetle). Although low genetic variability and reduced fitness from inbreeding could occur, at this time we have no evidence of such genetic problems with the valley elderberry longhorn beetle.

Based on our review of valley elderberry longhorn beetle occurrence records compared to aerial imagery and other documentation, small population size may potentially be the result of one or more threats (as evidenced by data showing that some locations may have experienced loss of elderberry shrubs over time). Small populations in general are particularly susceptible to extirpation as a result of localized stochastic events or local exposure to threats already discussed. Several records at the Sacramento River, Colusa to American River confluence, American River Confluence south to Delta, Bear River near Mokelumne, Calaveras River-Stockton Diverting Canal near Linden locations were associated with a few isolated elderberry plants or groups of plants that appear to have been completely lost since last observation or nearly so (i.e., since listing), and currently lack protections or enhancement measures that would allow regeneration or restore habitat (comparison of Service database described in the Finding section below and Barr (1991, pp. 24, 27, 29)). Other areas with elderberries lack beetles (see ''Population Status and Trends'' above). Talley *et al.* (2006a, p. 13) stated that low mobility, very small local populations, and isolation of habitat patches renders beetle populations especially susceptible to extirpation with little chance of recolonization. However, the best available information does not indicate small population size is a significant concern now, nor do we believe it will become a significant concern in the future. This assessment is based on our evaluation of the site-specific threats, protections, and recovery actions that exist at given locations throughout the species' range, and the prospectus for the beetle's persistence into the future at those locations (see Table 2 below and discussion in the Finding section). Additionally, we do not believe small population size is a significant concern given current data identifying increased number of occurrences known today as compared to the time of listing (i.e., 201 occurrence records at 26 locations compared to 10 occurrence records at 3 locations), as well as this subspecies' natural, patchy distribution (as described in the **Background** section above).

Loss of Populations Resulting From Habitat Fragmentation

As indicated under the ''Population Status and Trends'' section above, local valley elderberry longhorn beetle populations are subject to extirpation and subsequent recolonization, but recolonization is only likely if there are occupied areas within about 25 mi (40 km) from which colonizers can migrate (Collinge *et al.* 2001, pp. 108–110; Talley *et al.* 2006a, p. 10). Collinge *et al.* (2001, pp. 106, 108) has documented the long-term extirpation of the beetle from entire watersheds due to the apparent loss of the last occupied site within the specified distance. As previously noted, a comparison study between 1991 and 1997 data presented an overall moderately downward trend of valley elderberry longhorn beetle occupancy, as indicated by both short- and long-term extinctions and colonizations, by sites with elderberry shrubs, and by occupied shrub groups within each site (Talley *et al.* 2006a, p. 13). Although a downward trend was noted (Talley *et al.* 2006a), this conclusion is specific to the areas researched by Barr (1991) and Collinge *et al.* (2001). This observed trend should not necessarily be extrapolated to the long-term, rangewide status of the beetle due to the uncertainties involved in obtaining the results (e.g., all beetle habitat surveyed by Barr (1991) was not surveyed by Collinge *et al.* (2001), as further described in ''Population Status and Trends'' above).

At this time, we are unaware of any information that would support robust conclusions regarding the extent to which local beetle populations may become isolated from each other by distances of greater than 25 mi (40 km). We know that there are already discontinuities of more than this distance between some populations, especially in the south Central Valley, as well as within major corridors. We suspect that potential habitat fragmentation, in combination with small population size (discussed above), results in a greater combined threat of local extirpation in the south Central Valley. However, we have not censused all potential habitat in tributaries or uplands that may harbor the subspecies; additional populations not yet detected could increase the potential for recolonization.

It is possible that some level of threat from fragmentation and small population size (though we are uncertain of natural valley elderberry longhorn beetle population numbers) could have always existed. Nevertheless, our evaluation of the best available scientific and commercial information indicate that fragmentation remains as a threat today, and may increase in the future. However, we note that our 1980 estimates of the beetle's range were underestimates. Given our knowledge today, the level of threat posed by fragmentation is much reduced.

Summary of Factor E

Since listing, potential Factor E threats that could affect the valley elderberry longhorn beetle include climate change, pesticides, human use, loss of beetle populations due to habitat fragmentation, and small population size.

Climate change might affect the valley elderberry longhorn beetle through effects other than habitat distribution, such as shifts in the timing of elderberry flowering relative to beetle emergence, or impacts to the relationship of the listed and common beetle subspecies in some other way. Based on the best available scientific and commercial information at this time and absent any confirming information, we conclude that climate change is not a significant factor affecting the persistence of the valley elderberry longhorn beetle.

The valley elderberry longhorn beetle has been reported from locations adjacent to agriculture where pesticide application occurs. Information from occurrence records and other sources indicate that drift of pesticides into beetle habitat is of concern. However, we have no information regarding exposure of the beetle to specific pesticides or potential impacts to beetle populations from exposure. Although some effects of pesticides on elderberry shrubs have been noted, no link has been established between persistence or occurrence of the beetle and adjacency to farmed lands that use pesticides.

Some valley elderberry longhorn beetle occurrences are at least partially on publicly accessible areas that are subject to intended and unintended human uses, the impacts of which could result in incremental losses or reduction in the amount or quality of beetle habitat. However, available information indicates losses would likely not be frequent; thus, significant losses are not expected. There is also evidence of a variety of human use impacts involving trails, cutting, pruning, and fire in occupied beetle locations.

Based on review of occurrence records compared to aerial imagery and other documentation, loss of valley elderberry longhorn beetle populations due to fragmentation (which alone, or in combination with, other threats has the potential to result in small population size) remains a threat currently and potentially into the future. However, small population size is not considered a significant current or future threat, and the threat of fragmentation is not considered significant when taken within the context of the increased number of occurrences known today as compared to the time of listing. Additionally, we are unaware of any information that would support robust conclusions regarding frequent isolations of beetle populations across the subspecies' range, the extent to which local beetle populations may become isolated from each other by distances of greater than 25 mi (40 km), or whether any potential threats might be exacerbated by characteristics such as rarity or patchy distribution.

Finding

We have carefully assessed the best scientific and commercial data available regarding the past, present, and future threats faced by the valley elderberry longhorn beetle. As required by the Act, we considered the five potential threat factors to assess whether the beetle is endangered or threatened throughout all or a significant portion of its range. When considering the listing status of a species, the first step in the analysis is to determine whether it is in danger of extinction throughout all of its range. If this is the case, then the species is listed in its entirety. For instance, if the threats to a species are acting only on a portion of its range, but they are at such a large scale that they place the entire species in danger of extinction, we would continue to list the entire species.

When the valley elderberry longhorn beetle was listed in 1980, it was known from only the American River, Putah Creek, and the Merced River in the Central Valley of California. Its two primary threats were loss of habitat (Factor A) and inadequate regulatory mechanisms protecting the beetle (Factor D). Compared to the three locations known to support the beetle at the time of listing, surveys have identified at least 26 locations that support the beetle from Shasta County to Kern County (CNDDB 2010, pp. 1–202; Table 1). This represents a significant increase of occurrences and a significant change in our understanding of the subspecies' range as compared to the time of listing.

As first introduced and described above in the Summary of Factors Affecting the Species section, in order to examine the scale of threats and potential for extinction for the valley elderberry longhorn beetle within these locations and as a whole, we first

compiled a rangewide GIS spatial database that included all available information on beetle records, riparian vegetation, section 7 consultations, mitigation actions, conservation and other protection actions (including specific plantings of elderberry shrubs), current (year 2010) aerial imagery, roadways, and near term growth (i.e., through the year 2020). For each of the 26 locations identified in this rule, we used this database and supporting information to synthesize a best professional opinion of the prospectus for persistence with delisting at those locations, considering: (1) Current habitat; (2) occupation records by location (presented previously in Table 1); (3) threats; (4) protections and recovery actions; and (5) studies needed to address uncertainties in species data, protections, threats, and prospectus for persistence.

Aerial imagery was used to generally assess quality of habitat and proximity to disturbances or other threats (width, extent and continuity of riparian areas, disturbances such as trails and roads). We also considered GIS database entries and other literature descriptions on the size, number, and distribution of elderberry shrubs; trends over time; and other site-specific factors (see Table 2). Location specific threats are identified for the five-factors where appropriate or otherwise noted as pervasive threats that apply to all locations. Protections (conservation) and recovery actions we considered include known actions, the extent of assurance that those actions would be implemented and, where available, the documented effectiveness or failure of those recovery actions.

As presented in Table 2 below (Prospectus for Persistence with Delisting column), we did not formulate quantifiable measurable objectives for our determinations of persistence. Rather, the suite of information was considered together and given a qualitative persistence determination of poor, fair, average, good, or best. Several determinations were deemed questionable due to high levels of data uncertainty and are noted as such (uncertain); these are to be considered a best-case scenario for the purpose of this analysis. Occupation records were considered in terms of number and constancy over time, with greater likelihood where such records were consistent, recent, regular, and of more certain species identification (Table 1). Species presence and persistence were considered less certain where species records and habitat surveys were older, and where elevations were higher (where the valley elderberry longhorn beetle and the nonlisted California elderberry longhorn beetle subspecies overlap) and there was no adult male specimen to confirm identity.

TABLE 2—LOCATIONS, THREATS, PROTECTIONS, AND SUMMARY SPECIES STATUS INFORMATION FOR THE VALLEY ELDERBERRY LONGHORN BEETLE IN THE NORTH CENTRAL AND SOUTH CENTRAL VALLEYS OF CALIFORNIA

[Acronyms are defined below] [1]

Locations [2]	Site-specific threats (see below for pervasive threats under Factors C, D, and E that apply to all sites) [3]	Protections and recovery actions	Prospectus for persistence with delisting	Study needs (to address uncertainties in species data, protections, threats, and hence prospectus for persistence)
NORTH CENTRAL VALLEY				
1.a. Sacramento River (SR), Redding-Red Bluff.	Factor A: limited habitat loss from urban development in city and associated bank protection (nonproject); additional habitat remains on some tributaries but not others. Factor C: Argentine ants. (Holyoak and Graves 2010). Factor E: human use (recreation, cutting).	One small restoration (Turtle Bay, 120 acres).	Average. Persists with modest threats. Occupation at Stillwater-Paynes Creeks, negative surveys on Cow-Cottonwood Creeks. Infrequent limited surveys.	Continued and expanded habitat or subspecies surveys to include more tributaries.
1.b. SR, Red Bluff-Chico	Factor A: relatively low past loss/current threat; localized extensive loss in vicinity of small city; some agricultural encroachment; some bank protection; narrow riparian corridor band on mainstem and tributaries. Factor C: Argentine ants (Holyoak and Graves 2010).	Significant conservation easements, some with restoration to lessen effects of adjacent agriculture.	Good. Habitat somewhat improved by protections. Status uncertain due to age of surveys and low frequency. Species probably persists.	Consistent habitat and subspecies monitoring.
1.c. SR, Chico-Colusa	Factor A: least habitat loss or threat in mainstem, tributary channelization but not to completion; some bank protection/flood control noted, but no levees.	Significant conservation easements, some with restoration, to lessen effects of adjacent agriculture.	Good. Habitat somewhat improved by protections. Status uncertain due to age of surveys and low frequency. Subspecies probably persists.	Consistent habitat and subspecies monitoring.
1.d. SR, Colusa-American River confluence.	Factor A: intensive agricultural conversion, resulting in complete riparian vegetation loss between Colusa and Knight's Landing, then sparse/limited to Sacramento, due to past and recent flood control, including confinement by levees.	None known	Poor. Remaining habitat at risk due to private ownership, and vegetative maintenance of flood control facilities. Presence questionable.	Assess enhancement opportunity. Limited potential absent levee reconstruction/setback. Easements for near term land-side elderberries may help connect populations.

TABLE 2—LOCATIONS, THREATS, PROTECTIONS, AND SUMMARY SPECIES STATUS INFORMATION FOR THE VALLEY ELDERBERRY LONGHORN BEETLE IN THE NORTH CENTRAL AND SOUTH CENTRAL VALLEYS OF CALIFORNIA—Continued

[Acronyms are defined below] [1]

Locations [2]	Site-specific threats (see below for pervasive threats under Factors C, D, and E that apply to all sites) [3]	Protections and recovery actions	Prospectus for persistence with delisting	Study needs (to address uncertainties in species data, protections, threats, and hence prospectus for persistence)
1.e. SR, American River confluence south.	Factor A: significant past and ongoing habitat loss due to flood control, bank protection, and upgrades; recent habitat loss associated with urban development and emergency levee repair; extensive flood control (confinement by levees, bank protection, devegetation); sparse/limited/intermittent riparian vegetation remaining.	Minimal trial areas of vegetation on levees, small fraction (estimated at less than 1% of bank length); not of vegetation type to benefit beetle (i.e., not elderberry).	Fair. Declining. Remaining habitat at high risk due to ongoing maintenance and uncertainties on future maintenance of flood control facilities.	Assess enhancement opportunity, especially regarding the limited vegetation potential due to enforcement of Corps ETL; potential for more levee vegetation allowance via relaxed maintenance.
2. Thomes Creek	Factor A: modest rangeland/agricultural use; current vegetation appears limited from unknown cause; possibly naturally limited elderberry to the west by soil/alluvium type, lack of water.	None known	Fair. Status uncertain due to lack of habitat and subspecies surveys.	Updated habitat and subspecies surveys to evaluate potential species protections.
3. Stony Creek	Factor A: More agriculture compared to other watersheds in immediate vicinity, but not adjacent to riparian, plus more persistent water, results in more riparian vegetation than Thomes but still limited/sparse; elderberry verified only near reservoir, more suspected habitat near DWR-mapped riparian area near Orland.	Some conservation easements. Elderberry plantings near mouth. Status elsewhere unknown.	Fair (perhaps better). Status uncertain due to lack of habitat and subspecies surveys.	Updated habitat and subspecies surveys to evaluate potential species protections.
4. Big Chico Creek	Factor A: significant past loss from urban development in Chico; agriculture downstream; agriculture present in lower creek resulting in narrow but continuous corridor there; elsewhere riparian remains in moderate-to-wider band (e.g., Bidwell Park); abundant known elderberry.	Some parkland, especially in Chico. Mitigation bank nearby (Bidwell Ranch) at least partially offsets continuing urban impacts.	Good. Persistence probable	Updated habitat and subspecies surveys. Evaluate threats and protection needs downstream of Chico.
5. Feather River	Factor A: past losses due to levees/bank protection; ongoing threats due to fix-in-place west levee proposal; future threats reduced by protection/recovery actions resulting in locally wider riparian band in portions, but narrow riparian elsewhere. Factor C: Argentine ants ..... Factor E: human use (recreation, trails, fire, camping, cutting).	Significant conservation easements, some with restoration to lessen effects of adjacent agriculture.	Good. Existing conservation easements and proximity to Bear setback, Wildlands bank, indicate probable persistence.	Regular surveys. Evaluate alternatives to in-place west levee improvements (ring/J^3) to avoid growth inducement and urban encroachment.
6. Butte Creek	Factor A: losses/devegetation downstream of Chico; some remnant habitat may remain in Butte Sink area; best riparian vegetation is in lower canyon (upstream area), but this is currently unoccupied/unsurveyed.	Central Valley Joint Venture easement in portion of canyon (a few elderberry plantings above it). Otherwise unknown.	Good (but uncertain). Pending habitat and subspecies surveys or resurveys; assessment of elderberry success in protected canyon area.	Updated habitat and subspecies surveys; evaluate threats and protection needs downstream of Chico, especially in formerly occupied sink area.
7. Yuba River	Factor A: flood control; aggregate/gold mining; agriculture; elderberry present but unsurveyed, suspected to be minor component of overall riparian.	None known. Nearly all private	Uncertain occurrence of subspecies and habitat, hence questioned presence/persistence. Single survey date/exit hole for power line area not near river (some from dead wood).	Habitat and subspecies surveys. Local threats and benefit evaluation. Protection and restoration opportunity ID as appropriate.
8. Bear River	Factor A: past losses due to levees/bank protection; associated agricultural development.	Setback levee project with elderberry plantings at mouth; wildlands bank nearby.	Good. Persistence probable	Habitat and subspecies surveys. Identify maintenance within levees, and evaluate protective measures such as relaxed maintenance.

TABLE 2—LOCATIONS, THREATS, PROTECTIONS, AND SUMMARY SPECIES STATUS INFORMATION FOR THE VALLEY ELDERBERRY LONGHORN BEETLE IN THE NORTH CENTRAL AND SOUTH CENTRAL VALLEYS OF CALIFORNIA—Continued

[Acronyms are defined below] [1]

Locations [2]	Site-specific threats (see below for pervasive threats under Factors C, D, and E that apply to all sites) [3]	Protections and recovery actions	Prospectus for persistence with delisting	Study needs (to address uncertainties in species data, protections, threats, and hence prospectus for persistence)
9. Lower American River	Factor A: some flood control ... Factor C: Argentine ants ..... Factor E: human use (recreation, trails, fire, camping, cutting).	Extensive riparian plantings, monitoring; setback levees; management plan (implementation uncertain).	Best. Extensive habitat, protections with minimal threats. High occupancy. Persistence likely.	Continued monitoring. Determine funding mechanism of management plan implementation.
10. Upper American River vicinity (Miner and Secret Ravine, Coon, Anderson and Linda Creeks).	Factor A: urban development .. Factor E: human use (trails)	None known. Status of undeveloped portions unknown.	Fair overall (some may be better or worse). Habitat limited; affected by adjacent development northwest to Interstate 80.	Habitat and subspecies surveys. Evaluate protections and development threats.
11. Putah Creek	Factor A: narrowed corridor in major private land nearby agriculture (general threat). Factor C: Argentine ants ..... Factor E: human use (recreational, similar to lower American River, above).	Partly within park lands. Unknown in portions within private land. Management plans exist; assurances to implement unknown.	Good. Better habitat, less protection but reduced threats. Persistence likely.	Continued monitoring. Identify and evaluate protections in private areas.
12. Cache Creek	Factor A: Extensive past riparian vegetation loss due to adjacent agriculture, flood control, aggregate mining, resulting in limited habitat in the lower 2/3rds of creek.	None known	Good (at least partially). Persistence probable.	Habitat and subspecies surveys. Restoration and enhancement potential investigation.
13. Ulatis-Green Valley Creeks	Factor A: agriculture, flood control, channelization, suburban development; threat of habitat loss may be limited due to adjacent rugged terrain; some tributaries unchannelized.	None known	Good. Incremental losses due to urban development expected. Some decline, but persistence likely to occur somewhere in area.	Habitat and subspecies surveys. Identify current protections or needs in private areas.
SOUTH CENTRAL VALLEY				
14. Cosumnes-Laguna-Dry Creeks.	Factor A: urban development at Rancho Murieta-Wilton-Galt; agriculture/urban threat partly offset by preservation on part of Cosumnes only, not Laguna-Dry or Cosumnes outside preserve; riparian corridors currently narrow, some devegetated and not yet restored. Preserve lands include some waterfowl management, but elderberry there is undetermined.	5,500 acres lower watershed preserve; 780 acres upper watershed Laguna Creek Mitigation Bank; existing beetle habitat (elderberry) unquantified. Protection in private land and developed corridors unknown.	Good. Expect improving habitat but not yet restored. Former records largely outside of preserved or protected lands.	Habitat and subspecies surveys. Evaluation of threats and protection needs outside preserve in private areas. Habitat potential within preserved area.
15. Mokelumne-Bear Rivers	Factor A: limited urban development (Lockeford-Lodi, concentrated subdivision); moderate agriculture; riparian vegetation remaining somewhat wider and more intact/mature on most of the Mokelumne (but not at Lockeford); Bear riparian looked better than most tributaries on aerials, but Barr (1991) found no elderberry in riparian vegetation.	Approximately 197 acres of restoration. SHA: one enrollee for 300 acres with 12 elderberry shrubs, of 3,500 acres allowed in SHA.	Good. Persistence likely if beetle is present and either protections exist or absence of elevated threat in the future.	Habitat and subspecies surveys. Updated evaluation of threats and protection needs.
16. Stanislaus River	Factor A: agriculture and urban losses. Moderate-to-thin riparian vegetation remains but varies with location. Tributaries channelized and devegetated. Factor C: Argentine ants	Two elderberry planting sites (Mohler, McHenry). Partial failure at Mohler. Some parks may have other protections but not much is known.	Good. However, low occupancy. Persistence deemed probable based on elderberry abundance. Subspecies ID questionable near Goodwin.	Comprehensive habitat and subspecies surveys. Identify further restoration and protection measures as appropriate.

TABLE 2—LOCATIONS, THREATS, PROTECTIONS, AND SUMMARY SPECIES STATUS INFORMATION FOR THE VALLEY ELDERBERRY LONGHORN BEETLE IN THE NORTH CENTRAL AND SOUTH CENTRAL VALLEYS OF CALIFORNIA—Continued

[Acronyms are defined below] [1]

Locations [2]	Site-specific threats (see below for pervasive threats under Factors C, D, and E that apply to all sites) [3]	Protections and recovery actions	Prospectus for persistence with delisting	Study needs (to address uncertainties in species data, protections, threats, and hence prospectus for persistence)
17. Upper Stanislaus hills (vicinity above and between New Melones and Don Pedro Reservoirs, including Sullivan Creek).	Factor A: urban development/ranchette, especially around Sullivan Creek; some significant habitat loss, but similar unsurveyed landscape appears to remain unperturbed, scattered in hills.	None known	Average. Recent adult sightings (exit holes) suggests persistence probable due to terrain, limited road access, and distance from population center.	More thorough habitat and subspecies surveys to verify extent outside of development. Species ID (adult sighting not yet verified) especially since at elevation, may be unlisted California elderberry longhorn beetle species.
18. Calaveras River-Stockton Diverting Canal.	Factor A: agriculture, flood control (diversion channel, levee, maintenance activities); some adjacent urban use; but habitat still present to a variable extent (good to thin); corridor narrowed, significant portion sparse.	None known, but likely completely unprotected, mostly private.	Fair. Presence possible but questionable. Old records and lack of habitat survey. Linden area had records but vegetation looks thin now (denser upstream, thinner or absent downstream).	Habitat and subspecies surveys throughout. Threat evaluation and protection in private areas as warranted.
19. Tuolumne River	Factor A: extensive aggregate mining, urban development, and agriculture depending on location. Mostly narrow habitat remaining, with some areas of better quality.	Several floodway restorations include conservation easements; one (mining reach—7/11 segment) has 87 acres, 160 elderberry plants; other reaches unknown.	Fair (or better). Uncertainty due to old subspecies surveys. No current beetle habitat (elderberry) information. Presence and persistence questionable.	Habitat and subspecies surveys. Identify restoration and protection opportunities specific to beetle.
20. Merced River	Factor A: extensive aggregate mining, intensive agriculture, caused losses; narrow mainstem riparian; split channels channelized and devegetated. Factor C: Argentine ants	None for beetle. Channel restoration on less than 5% of length; protections unknown.	Fair. Old subspecies surveys. No current beetle habitat (elderberry) information. Presence and persistence questionable.	Habitat and subspecies surveys. Identify restoration and protection opportunities.
21. Kings River	Factor A: extensive agriculture, resulting in narrow riparian corridor downstream and near dam; wider in split channel area; sparse but unimpacted upstream. Subspecies may be extirpated (negative 2010 survey) for unknown reasons.	None known	Uncertain. Depends on remaining habitat quantity/quality, subspecies resurvey, or recolonization event. Some adult IDs in this location have been questioned.	Habitat and species surveys. Assess potential causes of loss of species occupancy. Identify remedial measures specific to cause(s).
22. Kaweah River	Factor A: development variable (limited above Isabella; extensive agriculture and significant urban below Isabella), resulting in sparse/narrow/intermittent riparian corridor downstream in split channels; partially channelized/largely devegetated.	Some sites protected as mitigation for impacts of Corps dam works; other protections unknown.	Fair. Likely declining with growth of Visalia or increase in agricultural intensity. Persistence and presence uncertain. ID not confirmed.	Habitat and subspecies surveys. Identify restoration and protection opportunities.
23. Tule River-Deer Creek	Factor A: encroachment by agriculture/urban development; trails/human use in corridor; flood control activities; narrow sparse riparian vegetation. Factor C: Argentine ants	None known	Uncertain due to age/infrequency of surveys, limited habitat, absence of adults to confirm ID.	Evaluate human usage and identify management needs. Habitat and subspecies surveys. Identify enhancement and restoration opportunities.
24. Kern River (excluding Caliente Creek).	Factor A: urban/suburban development; roads and trails; vegetation clearing and diversion downstream. Factor E: human use (trails)	None known	Fair (and declining). Narrow intermittent corridor of questionable quality includes some elderberry, but heavily impacted. Persistence and presence (including species ID) uncertain.	Habitat and subspecies surveys. Assess and identify restoration and protection opportunities that could enhance habitat.
25. Caliente Creek	Factor A: nearby roadway; some trails in a portion of riparian vegetation; sparse residential and ranching use; completely channelized and devegetated in Central Valley; portion in foothills has intermittent riparian vegetation, infrequent elderberry on creek, and on nearby upland and entering tributary.	None known	Unknown due to suspect/old record (exit hole condition; 1,000–2,400 foot elevation). No information before 1991. ID questioned.	Conduct more thorough habitat and subspecies surveys to verify extent of elderberry, exit holes in mainstem, and tributaries. Adult ID especially since at elevation may be unlisted California elderberry longhorn beetle species.

TABLE 2—LOCATIONS, THREATS, PROTECTIONS, AND SUMMARY SPECIES STATUS INFORMATION FOR THE VALLEY ELDERBERRY LONGHORN BEETLE IN THE NORTH CENTRAL AND SOUTH CENTRAL VALLEYS OF CALIFORNIA—Continued

[Acronyms are defined below] [1]

Locations [2]	Site-specific threats (see below for pervasive threats under Factors C, D, and E that apply to all sites) [3]	Protections and recovery actions	Prospectus for persistence with delisting	Study needs (to address uncertainties in species data, protections, threats, and hence prospectus for persistence)
26. San Joaquin River	Factor A: intensive agriculture; some urban development (Fresno); flood control throughout; portion nearest to Friant has riparian corridor, but much of this system is completely devegetated.	Parkway from Millerton to Fresno; some protections but not necessarily for the beetle. Limited Central Valley Joint Venture riparian easements, mostly not elderberry. Some elderberry plantings on NWRs.	Fair (in best areas), otherwise mostly poor. Sparse elderberry, low occupancy. May improve with planting age or other nonbeetle-specific restoration.	Conduct further habitat and subspecies surveys. Assess restoration opportunities for elderberry, including the addition of elderberry to ongoing or proposed restorations.

[1] Table acronyms: ID—taxonomic identification of the subspecies, whether listed or common beetle; ETL—Corps Engineering Technical Letter; DWR—Department of Water Resources; SHA—Safe Harbor Agreement; NWR—National Wildlife Refuge; J and ring—structural levee alternatives, sometimes located away from a floodway or riparian zone, as such these alternatives could provide local flood protection to higher value urban areas (such as communities of Live Oak and Gridley west of the Feather River), and avoid the impacts and need for vegetative maintenance associated with improving the levee in its current location (also known as ''in place'' levee improvements).

[2] The locations presented in this table are based on available data that provide detailed information about valley elderberry longhorn beetle presence. Additional locations were not included in this table due to a lack of sufficient information that provides certainty on valley elderberry longhorn beetle presence (areas with extremely limited habitat, locations that are exclusively at higher elevation that abut with the range of the California elderberry longhorn beetle, a record of a single shrub, etc.).

[3] Pervasive threats (all sites): Factor C—The specific threat of Argentine ant denotes those sites with documented presence; there has been inadequate or no sampling at other sites to make a determination. However, based on the widespread infestation of Argentine ant in nursery stock and lack of control, we believe this threat applies to all sites until shown otherwise; Factor D—The inadequacies of regulatory mechanisms, as described in the text, applies to a variable extent to all sites; Factor E—The specific threats noted are instances of human use noted in literature or aerial imagery; however, human use likely applies to portions of other sites. Additionally, as described in the text, Factor E includes other factors such as habitat fragmentation, small population size, and climate change that apply to all sites, and pesticide effects that applies to all sites with the possible exception of some foothill areas.

The potential for valley elderberry longhorn beetle persistence varies among the 26 locations and especially between the north and south Central Valley. The following paragraphs provide a summary rangewide evaluation of the beetle and its habitat based on the five-factor analysis presented above.

Summary—North Central Valley

The north Central Valley has seven major locations, or portions thereof, where the beetle's persistence in the foreseeable future is likely due to a combination of: (1) Low threats and adequate protection measures; and (2) multiple and recent records, some with confirmation of adult beetles (Sacramento River north of Colusa, the lower American, Feather, and Bear Rivers, and Big Chico, Cache, and Putah Creeks). The protection measures include an array of existing and initially restored beetle habitat, and many have a wide or relatively unchanged riparian vegetation corridor with limited adjacent land-use, suggesting development or agriculture-related threats to these locations are reduced. Two additional locations in the north Central Valley were also deemed likely to persist, although both are smaller, and there is more uncertainty with respect to presence and threat due to the age of records, recent development, or uncertainties about threats and the need for protections (Butte Creek, Ulatis-Green Valley Creeks).

Even in these north Central Valley locations where valley elderberry longhorn beetle persistence is most likely, the extent of elderberry shrubs has not yet been fully quantified nor consistently monitored. Threats, and the likelihood of valley elderberry longhorn beetle persistence, vary markedly along the Sacramento River. Threats are minimal and beetle persistence is considered at least average north of Colusa to Redding, where there is protected habitat on refuge lands and reports of beetle occupation (River Partners 2004a). Threats are increased and beetle persistence is considered fair to poor on the Sacramento River south of Colusa to its Delta confluence; most of this area has no woody vegetation of any kind due to extensive rock bank protection. As shown by confirmed adult male specimens (Table 1, location 1.e), a remnant population of the beetle persisted on the Sacramento River near West Sacramento until recently, when the remaining habitat was lost at the expense of recent flood control improvements. With the possible exceptions of the lower American River, the best known location of the beetle, every other location (including portions of locations in which we have deemed the beetle likely to persist) in the valley proper (the valley floor of the Sacramento and San Joaquin Valleys combined) has a major section lacking riparian vegetation that almost certainly does not support the beetle due to complete absence of habitat in that section (Table 2).

Finally, there are no systems in the north Central Valley that are completely free of threats. In the American River and Putah Creek, for example, there are no, or limited, threats associated with development and agriculture; however, these areas continue to be subject to human use threats. There are management plans for the American River and Putah Creek locations (systems) that appear to be protected in their current ownership; however, the legal assurances for this protection and funding for implementation in perpetuity are unknown. Virtually all major rivers and tributaries in the Central Valley (both north and south) are subject to some level of effect from flood control operations and vegetative maintenance that affects or suppresses riparian vegetation (and associated beetle habitat if present), although this effect varies among locations and reaches within a location.

Summary—South Central Valley

In the south Central Valley, the locations considered to have a good or average potential for persistence of valley elderberry beetle populations are those immediately south of Sacramento to about Stanislaus County (Cosumnes-Laguna-Dry Creeks, Mokelumne-Bear Rivers, lower Stanislaus River, Upper Stanislaus hills). However, the protections of existing riparian vegetation (including beetle habitat) are not well known for many of these riparian corridors. The Cosumnes River Preserve mentioned elsewhere in this rule covers only a portion of the Cosumnes River (perhaps 20 percent of its length), yet beetle records and habitat are largely outside the Preserve. Much

of the apparently intact riparian vegetation the Service has identified on aerial photos along the Cosumnes, Mokelumne, and Stanislaus Rivers is of unknown ownership (public or private) and protective status. Additionally, the actual extent of elderberry shrubs and beetle occupancy has not, to our knowledge, been determined. Records of the beetle are known in each of these locations since listing, but are infrequent (5 to 6 occurrence years in the 30 years since listing; see Table 1). Even less is known about the beetle on the Calaveras River, where records (including an adult) were known from isolated habitat in largely devegetated portions of the river near Linden.

None of the other locations in the south Central Valley appear to have a good likelihood of beetle persistence (Table 2). This is because of the age of records, in combination with:

(1) Significant habitat loss (such as Kaweah, Merced, Tule, and Kern Rivers) since listing;

(2) Recent negative surveys (such as Kings River—Holyoak and Graves 2010, p. 8; San Joaquin River reaches 1B through 6—Kucera *et al.* 2006, p. 9 and River Partners 2007, p. 10);

(3) Low occupancy (Stanislaus River; Holyoak and Graves 2010 p. 7, River Partners 2007, p. 10);

(4) Absence of recent information (Calaveras River; exit hole last seen in 2000; adult in 1984) since listing;

(5) Limited overall riparian vegetation (most locations, especially lower rivers, which tend to be devoid of any woody vegetation); or

(6) Lack of protections or habitat quantification (most sites, except for San Luis NWR) (for additional location-specific rationales, see Table 2). Where there is habitat—often in higher elevations—there is a lack of positive subspecies identification via sightings of adult male specimens where the two subspecies likely overlap (higher elevation sites, such as Caliente Creek, upper American River vicinity, Kaweah River upstream of Lake Isabella). Even for the Stanislaus Hills location, which is a location that we presume the beetle persists, we have not been able to verify the identity of the adult sighting for this proposed rule.

According to Table 2, a prospectus for persistence that is considered poor, fair, average, or good (as compared to best) does not mean that the valley elderberry longhorn beetle is likely to be extirpated from the south Central Valley without continued protections of the Act. In those instances, a lower than best prospectus is usually due to the diminished condition of the riparian corridor, higher magnitude of threat, lack of known protections, and lack of recent habitat or species information. Overall, there is not a significant difference in the prospects for persistence from north to south, with 88 percent of locations in the north having the prospect of fair, average, good, or best, and 77 percent of locations in the south habitat a prospect of fair, average, or good.

As a whole, the south Central Valley (as compared to the north Central Valley) exhibits reduced valley elderberry longhorn beetle presence, density, and quality of riparian vegetation on major rivers and tributaries, and largely channelized and devegetated tributaries, particularly on the valley floor. These characteristics may at least partially explain why the beetle occurrences are rarer in the south as compared to the northern portion of its range.

Accordingly, we believe the valley elderberry longhorn beetle populations in most areas in the south Central Valley are likely to be small and subject to occasional episodes of extirpation. Whether or not recolonization occurs would depend on proximity to other beetle populations within dispersal distance, which would be those in foothill habitats above and between the major reservoirs. Due to the lack of adult male specimens (or verification where such records exist) from these foothill areas, it is not known whether these foothill populations are the federally threatened valley elderberry longhorn beetle or the more common California elderberry longhorn beetle. However, the valley elderberry longhorn beetle's long-term persistence in the south Central Valley depends not only on recolonization from the nearest beetle population within dispersal distance, but also on the presence of habitat and protection of habitat from threats. In general, the amount of riparian vegetation and associated beetle habitat in the south Central Valley, particularly the valley floor, is much more limited than in the north, and habitat protections are largely unknown for most known beetle locations (Table 2).

Rangewide Discussion

Rangewide, we believe that valley elderberry beetle populations at 13 locations (or portions of these locations) have an average or better likelihood of persistence after delisting (9 in the Sacramento Valley; 4 in the San Joaquin Valley). The remaining 13 populations (4 in the Sacramento Valley; 9 in the San Joaquin Valley) are less likely to persist (deemed fair-to-poor, some currently declining, with many of questionable current existence due to age of records, elevation and absence of confirming adult specimens, or apparent complete loss of habitat; see Table 2). Some of the locations in both the Sacramento and San Joaquin Valleys, where persistence is deemed likely in portions of the location (such as Sacramento River, Redding to Colusa), also have been determined to have major sections where persistence is unlikely due to habitat loss since listing or last observation of the beetle (such as Sacramento River, Colusa to American River and south to Delta; see Table 2 for other examples).

The uncertainties identified in this analysis can only be resolved through additional study. Valley elderberry longhorn beetle occurrence data (based on the CNDDB data available) have some amount uncertainty due to:

(1) The difficulty in verifying the species (because it spends most of its life *inside* elderberry stems, identification is mostly by finding exit holes, which can be misidentified);

(2) The age of records (largely 1991 and earlier) and limited current and frequent surveys;

(3) The fact that some records that were based on exit holes occurred at higher elevations, which—in the absence of adult specimens—could also be the unlisted subspecies;

(4) The complete loss of elderberry shrubs from some of the 26 locations during the period since observations were recorded;

(5) In some of the 26 locations during the period since observations were made, more recent surveys did not find the beetle where elderberries still persist; and

(6) Detection is limited at locations with low or naturally low beetle population sizes. More data, over a longer time period, would improve our confidence in persistence determinations for locations with small population sizes.

Similarly, there is uncertainty as to the effectiveness of recent restoration efforts. Although approximately 21,536 ac (8,715 ha) of riparian vegetation have been protected through purchase or conservation easement, the proportion of this protected habitat that consists of elderberry shrubs, or would support elderberry, is unclear (i.e., beyond the 4,000 ac (1,619 ha) of existing plantings). Similarly, we still lack comprehensive information on the general effectiveness of habitat restoration and protection efforts, especially since the existing elderberry plantings are relatively recent and much is unoccupied. Even where plantings have resulted in beetle occupation, the rate of occupation varies (less than 0.1

percent to 7.9 percent of shrubs with exit holes; River Partners 2004a, pp. 2–3). The ability of these areas to support long-term populations of the beetle has yet to be established, largely because the restorations are still too young (at most 13 years old), and survey efforts too infrequent (1–2 times) to make a determination of long-term persistence or stability.

There is also uncertainty as it relates to the actual amount of riparian vegetation (or other upland vegetation type) within the valley elderberry longhorn beetle's range that can support elderberry and, potentially, the beetle. As presented above, only a portion of protected land is riparian, and only some supports (or has characteristics to support) elderberry. Central Valley-wide, about 1 million ac (404,686 ha) of riparian vegetation have been lost since the turn of the century, and about 132,000 ac (53,418 ha) of that has been relatively recent (since 1960) (Geographic Information Center 2003). Based on our evaluation of available information for this analysis, we determined that of the approximately 132,000 ac (53,418 ha) of riparian vegetation left, a small portion of which is protected (21,536 ac (8,715 ha)), and a subset of this amount is actually elderberry (at most 5,000 to 7,000 ac (2,023 to 2,833 ha), but likely less). Admittedly, elderberries do occur outside of true riparian vegetation, and both riparian and nonriparian vegetation may support the beetle in its range outside the Central Valley proper. However, the extent of the beetle in these other areas (i.e., uplands in the Central Valley, foothills outside the Central Valley) would require more study involving adult male collection and identification to resolve with certainty. Even if there were significant numbers of elderberry shrubs outside of riparian systems, the extent to which these are used by beetle compared to riparian systems, and the extent to which these would offset shrub losses within riparian areas, has not been ascertained. Since listing, the rate of loss of riparian vegetation has slowed compared to historical times.

Most valley elderberry longhorn beetle habitat, occurrences, and locations are outside of the 21,536 ac (8,715 ha) of protected habitat, and have no (or no known) protections. The restoration efforts and protected habitat are largely concentrated on refuge lands, which are a minority of the current range of the valley elderberry longhorn beetle. Of the 23 beetle locations discovered since listing, 12 include habitat that is unprotected or whose protections are unknown. Resolving the uncertainties of the extent of threats and protections may be useful in identifying locations where additional protective measures would most benefit the beetle. Notwithstanding these uncertainties, it is clear that protections appear to be greatest in the north Central Valley where more occurrences are known.

Of the 26 known locations, four include a significant component of well-protected lands with known beetle habitat mainly as State or Federal wildlife areas, and portions of six others contain some well-protected lands. All or portions of seven locations are managed for open space or natural values, or are partially on city parks or Forest Service lands where the particular threat of habitat loss is reduced, but other threats from human use remain. All or portions of seven other locations throughout the Central Valley include private lands where (despite lack of formal protections) threats are presently reduced due to their remote or rural nature associated with topography, which limits the more pervasive threats of agricultural and urban development, or are currently the subject of a safe harbor agreement. The majority of locations contain some lands without protections, some of which are private or designated as floodways that could experience activities that affect beetle habitat. These unprotected locations encompass most of the range of the subspecies including riparian zones in major drainages. Therefore, we conclude that agricultural and urban development, levees, and flood control protection remain as threats to the valley elderberry longhorn beetle in relation to the present or threatened destruction, modification, or curtailment of its habitat or range, both currently and in the future (Factor A). However, these habitat-based threats are not considered significant when taken within the context of the increased number of beetle occurrences known today as compared to the time of listing.

We have found nothing to indicate that the valley elderberry longhorn beetle is threatened by overutilization, for any purpose (Factor B).

While the valley elderberry longhorn beetle may be preyed on by Argentine ants (Factor C), and there is some evidence to indicate that a negative association between presence of the beetle and presence of the ant at some local sites may be related to ant density, the beetle has persisted alongside the ant in larger areas, such as Putah Creek and the American River Parkway, for over 10 years. As there have been no dense concentrations of the ants reported, predation is not believed to be a significant threat.

In the absence of protection under the Act, the regulatory and other legal mechanisms protecting the valley elderberry longhorn beetle from habitat loss would be minimal, except in areas such as conservation easements, mitigation banks, and National Wildlife Refuges specifically managed for the protection of the beetle (Factor D). Riparian vegetation restoration on private lands is implemented under a variety of State and Federal programs. While we would not expect a delisting of the beetle to affect the amount of riparian vegetation restored under these programs. If the beetle were delisted, we anticipate future losses of beetle habitat due to loss of regulatory protection under the Act, especially under sections 7 and 10, but that loss may be offset to a small degree by an increased private landowner willingness to include elderberries in riparian vegetation restoration on their lands. However, removal of the protections of the Act could result in increased losses where the protective provisions of the Act serve to deter habitat modification or destruction on otherwise unprotected private lands. Based on the best available data, we believe it is possible that habitat losses of this type may increase if the subspecies were delisted; thus, there may need to be a commensurate increase in restoration and conservation efforts beyond the State and Federal programs mentioned above to offset this anticipated increased loss. We do not consider the inadequacy of existing regulatory mechanisms to be a threat currently nor in the future for the areas providing protection for the beetle and its habitat (such as portions of locations along the Sacramento River between Red Bluff-Chico and Chico-Colusa, the Feather River, and the Cosumnes-Laguna-Dry Creeks locations). For areas within the beetle's range where protections are less, the prospectus for persistence is considered poor at one location (the Colusa-American River confluence of the Sacramento River), uncertain at four locations (Yuba River in the north Central Valley and the Kings River, Tule River-Deer Creek, and Caliente Creek in the south Central Valley), and fair, average, good or best at all remaining locations (Table 2).

The valley elderberry longhorn beetle has been reported from locations adjacent to agriculture where pesticide application may occur. Pesticides are rarely applied directly to riparian vegetation or, if they are used within riparian vegetation, are believed to be normally applied in a highly controlled manner to target species. This reduces

some of the potential exposure of the beetle to pesticides. Because of the proximity of beetle habitat to agriculture, the potential for pesticide exposure through drift remains and has been noted in association with a number of occurrences of the beetle. However, the relationship of persistence or occurrence of the beetle to adjacency of farmed lands that utilize pesticides has not been thoroughly examined (Factor E).

Climate change might affect the valley elderberry longhorn beetle through habitat effects (i.e., potential changes in temperature and precipitation patterns that could affect elderberry growth; Factor A), or other direct and indirect impacts to the subspecies, such as shifts in the timing of elderberry flowering relative to beetle emergence, or affects to the relationship of the listed and common beetle subspecies in some other way. We are not aware of information that would allow us to make a meaningful prediction about the extent of threats related to climate change (Factors A and E).

Some valley elderberry longhorn beetle occurrences reside at least partially on publicly accessible areas that are subject to intended and unintended human uses, the impacts of which could result in incremental losses or reduction in the amount or quality of beetle habitat. Our evaluation suggests that this type of loss continues among the most important locations of the beetle such as the lower American River, Putah Creek, and other locations. However, available information indicates losses would likely not be frequent; thus, significant losses resulting from human use (including trails, cutting, pruning, and fire) in occupied locations of the beetle are not expected (Factor E).

The best available information suggests that many local beetle populations are isolated from others by distances of greater than the estimated 25 mi (40 km) dispersal distance needed for recolonization. Based on review of occurrence records compared to aerial imagery and other documentation, loss of populations due to fragmentation, and small population size as a result of potential threats to the subspecies, we anticipate these impacts may continue in the foreseeable future (Factor E), although they are not considered significant when taken within the context of the increased number of beetle occurrences known today as compared to the time of listing.

In this proposed rule, we have carefully assessed the best scientific and commercial data available regarding the past, present, and future threats faced by the valley elderberry longhorn beetle, and conclude that the Act's threatened designation no longer correctly reflects the current status of this subspecies. While there are minimal surveys to comprehensively evaluate current presence or population trends over time, we believe the available data are sufficient to conclude that the beetle persists in several additional major locations that were not known at the time of listing, including some locations where habitat restoration and protection has taken place (i.e., Sacramento River, Feather River, and some adjacent tributaries). Records since listing show the beetle may currently occupy most of the 26 locations identified and continues to persist in these locations, as is expected for some period of time into the future.

This accumulation of records over the past 30 years establishes that the beetle's range is larger than was known at the time of listing, albeit patchily distributed in small populations. However, our listing anticipated the finding of additional populations in its determination of the threatened status (Service 1980, p. 52804) and identified these suspected locations in our Recovery Plan (Service 1984, pp. 32–34). Specifically, there are 26 locations that have been documented to have been occupied since the subspecies was listed compared to 3 locations known at the time of listing. These 26 locations occur throughout the Central Valley, compared to the 3 locations known only from the lower American River, Putah Creek, and the Merced River (Talley *et al.* 2006a, p. 23; Service 2006a, p. 5; CNDDB 2010, pp. 1–202).

Notwithstanding data uncertainties and the absence of protections or enhancements at many locations, we believe sufficient habitat will remain within this range into the foreseeable future and the subspecies no longer meets the definition of endangered or threatened under the Act. Additionally, we believe the beetle will continue to persist based on: (1) The increase in number of beetle occurrence records; (2) increase in number of locations the beetle is found, including over a larger range then what was known at the time of listing; (3) past and ongoing riparian vegetation restoration; and (4) the persistence of elderberry shrubs in these restored areas, as well as a variety of public lands managed for natural values as open space.

Significant Portion of Its Range

The Act defines ''endangered species'' as any species which is ''in danger of extinction throughout all or a significant portion of its range,'' and ''threatened species'' as any species which is ''likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.'' The definition of ''species'' is also relevant to this discussion. The Act defines ''species'' as follows: ''The term 'species' includes any subspecies of fish or wildlife or plants, and any distinct population segment [DPS] of any species of vertebrate fish or wildlife which interbreeds when mature.'' The phrase ''significant portion of its range'' (SPR) is not defined by the statute, and we have never addressed in our regulations: (1) The consequences of a determination that a species is either endangered or likely to become so throughout a significant portion of its range, but not throughout all of its range; or (2) what qualifies a portion of a range as ''significant.''

Two recent district court decisions have addressed whether the SPR language allows the Service to list or protect less than all members of a defined ''species'': *Defenders of Wildlife* v. *Salazar,* 729 F. Supp. 2d 1207 (D. Mont. 2010), concerning the Service's delisting of the Northern Rocky Mountain gray wolf (74 FR 15123, April 2, 2009); and *WildEarth Guardians* v. *Salazar,* 2010 U.S. Dist. LEXIS 105253 (D. Ariz. Sept. 30, 2010), concerning the Service's 2008 finding on a petition to list the Gunnison's prairie dog (73 FR 6660, February 5, 2008). The Service had asserted in both of these determinations that it had authority, in effect, to protect only some members of a ''species,'' as defined by the Act (i.e., species, subspecies, or DPS), under the Act. Both courts ruled that the determinations were arbitrary and capricious on the grounds that this approach violated the plain and unambiguous language of the Act. The courts concluded that reading the SPR language to allow protecting only a portion of a species' range is inconsistent with the Act's definition of ''species.'' The courts concluded that once a determination is made that a species (i.e., species, subspecies, or DPS) meets the definition of ''endangered species'' or ''threatened species,'' it must be placed on the list in its entirety and the Act's protections applied consistently to all members of that species (subject to modification of protections through special rules under sections 4(d) and 10(j) of the Act).

Consistent with that interpretation, and for the purposes of this finding, we interpret the phrase ''significant portion of its range'' in the Act's definitions of ''endangered species'' and ''threatened species'' to provide an independent basis for listing; thus there are two

situations (or factual bases) under which a species would qualify for listing: a species may be endangered or threatened throughout all of its range; or a species may be endangered or threatened in only a significant portion of its range. If a species is in danger of extinction throughout an SPR, it, the species, is an ''endangered species.'' The same analysis applies to ''threatened species.'' Based on this interpretation and supported by existing case law, the consequence of finding that a species is endangered or threatened in only a significant portion of its range is that the entire species will be listed as endangered or threatened, respectively, and the Act's protections will be applied across the species' entire range.

We conclude, for the purposes of this finding, that interpreting the SPR phrase as providing an independent basis for listing is the best interpretation of the Act because it is consistent with the purposes and the plain meaning of the key definitions of the Act; it does not conflict with established past agency practice (i.e., prior to the 2007 Solicitor's Opinion), as no consistent, long-term agency practice has been established; and it is consistent with the judicial opinions that have most closely examined this issue. Having concluded that the phrase ''significant portion of its range'' provides an independent basis for listing and protecting the entire species, we next turn to the meaning of ''significant'' to determine the threshold for when such an independent basis for listing exists.

Although there are potentially many ways to determine whether a portion of a species' range is ''significant,'' we conclude, for the purposes of this finding, that the significance of the portion of the range should be determined based on its biological contribution to the conservation of the species. For this reason, we describe the threshold for ''significant'' in terms of an increase in the risk of extinction for the species. We conclude that a biologically based definition of ''significant'' best conforms to the purposes of the Act, is consistent with judicial interpretations, and best ensures species' conservation. Thus, for the purposes of this finding, and as explained further below, a portion of the range of a species is ''significant'' if its contribution to the viability of the species is so important that without that portion, the species would be in danger of extinction.

We evaluate biological significance based on the principles of conservation biology using the concepts of redundancy, resiliency, and representation. *Resiliency* describes the characteristics of a species and its habitat that allow it to recover from periodic disturbance. *Redundancy* (having multiple populations distributed across the landscape) may be needed to provide a margin of safety for the species to withstand catastrophic events. *Representation* (the range of variation found in a species) ensures that the species' adaptive capabilities are conserved. Redundancy, resiliency, and representation are not independent of each other, and some characteristic of a species or area may contribute to all three. For example, distribution across a wide variety of habitat types is an indicator of representation, but it may also indicate a broad geographic distribution contributing to redundancy (decreasing the chance that any one event affects the entire species), and the likelihood that some habitat types are less susceptible to certain threats, contributing to resiliency (the ability of the species to recover from disturbance). None of these concepts is intended to be mutually exclusive, and a portion of a species' range may be determined to be ''significant'' due to its contributions under any one or more of these concepts.

For the purposes of this finding, we determine if a portion's biological contribution is so important that the portion qualifies as ''significant'' by asking whether *without that portion,* the representation, redundancy, or resiliency of the species would be so impaired that the species would have an increased vulnerability to threats to the point that the overall species would be in danger of extinction (i.e., would be ''endangered''). Conversely, we would not consider the portion of the range at issue to be ''significant'' if there is sufficient resiliency, redundancy, and representation elsewhere in the species' range that the species would not be in danger of extinction throughout its range if the population in that portion of the range in question became extirpated (extinct locally).

We recognize that this definition of ''significant'' (a portion of the range of a species is ''significant'' if its contribution to the viability of the species is so important that without that portion, the species would be in danger of extinction) establishes a threshold that is relatively high. On the one hand, given that the consequences of finding a species to be endangered or threatened in an SPR would be listing the species throughout its entire range, it is important to use a threshold for ''significant'' that is robust. It would not be meaningful or appropriate to establish a very low threshold whereby a portion of the range can be considered ''significant'' even if only a negligible increase in extinction risk would result from its loss. Because nearly any portion of a species' range can be said to contribute some increment to a species' viability, use of such a low threshold would require us to impose restrictions and expend conservation resources disproportionately to conservation benefit: listing would be rangewide, even if only a portion of the range of minor conservation importance to the species is imperiled. On the other hand, it would be inappropriate to establish a threshold for ''significant'' that is too high. This would be the case if the standard were, for example, that a portion of the range can be considered ''significant'' only if threats in that portion result in the entire species' being currently endangered or threatened. Such a high bar would not give the SPR phrase independent meaning, as the Ninth Circuit held in *Defenders of Wildlife* v. *Norton,* 258 F.3d 1136 (9th Cir. 2001).

The definition of ''significant'' used in this finding carefully balances these concerns. By setting a relatively high threshold, we minimize the degree to which restrictions will be imposed or resources expended that do not contribute substantially to species conservation. But we have not set the threshold so high that the phrase ''in a significant portion of its range'' loses independent meaning. Specifically, we have not set the threshold as high as it was under the interpretation presented by the Service in the *Defenders* litigation. Under that interpretation, the portion of the range would have to be so important that current imperilment there would mean that the species would be *currently* imperiled everywhere. Under the definition of ''significant'' used in this finding, the portion of the range need not rise to such an exceptionally high level of biological significance. (We recognize that if the species is imperiled in a portion that rises to that level of biological significance, then we should conclude that the species is in fact imperiled throughout all of its range, and that we would not need to rely on the SPR language for such a listing.) Rather, under this interpretation we ask whether the species would be endangered everywhere without that portion, *i.e.,* if that portion were completely extirpated. In other words, the portion of the range need not be so important that even the species being in danger of extinction in that portion would be sufficient to cause the species in the remainder of the range to be

endangered; rather, the *complete extirpation* (in a hypothetical future) of the species in that portion would be required to cause the species in the remainder of the range to be endangered.

The range of a species can theoretically be divided into portions in an infinite number of ways. However, there is no purpose to analyzing portions of the range that have no reasonable potential to be significant or to analyzing portions of the range in which there is no reasonable potential for the species to be endangered or threatened. To identify only those portions that warrant further consideration, we determine whether there is substantial information indicating that: (1) The portions may be ''significant,'' *and* (2) the species may be in danger of extinction there or likely to become so within the foreseeable future. Depending on the biology of the species, its range, and the threats it faces, it might be more efficient for us to address the significance question first or the status question first. Thus, if we determine that a portion of the range is not ''significant,'' we do not need to determine whether the species is endangered or threatened there; if we determine that the species is not endangered or threatened in a portion of its range, we do not need to determine if that portion is ''significant.'' In practice, a key part of the determination that a species is in danger of extinction in a significant portion of its range is whether the threats are geographically concentrated in some way. If the threats to the species are essentially uniform throughout its range, no portion is likely to warrant further consideration. Moreover, if any concentration of threats to the species occurs only in portions of the species' range that clearly would not meet the biologically based definition of ''significant,'' such portions will not warrant further consideration.

We consider the ''range'' of the valley elderberry longhorn beetle to be the Central Valley of California, from Shasta to Kern Counties. Because the beetle is dependent on the presence of elderberry shrubs, we consider suitable habitat within the range to be those areas currently supporting elderberry. We consider potentially suitable habitat within the range to be those areas likely to support elderberry shrubs within the foreseeable future. We base this on restoration or protection efforts for riparian vegetation, or on plans for future elderberry restoration efforts.

The valley elderberry longhorn beetle's range can naturally be divided into the Sacramento Valley to the north, and the San Joaquin Valley to the south. In Table 2, we conducted a spatial evaluation of the level of threat and extent of protective measures at each of the 30 locations where the beetle is known to occur (which include 5 separate locales along the Sacramento River that when combined result in a total of 26 beetle locations) in order to determine if any portion of the range were at risk of local extinction. Based on this assessment, there does not appear to be a significant concentration of threats in any portion of the species range. Of the 30 locations, 17 locations occur in the north Central Valley, and 15 of those (88 percent) have a fair, average, good, or best likelihood of persistence. Thirteen locations occur in the south Central Valley, and 10 of those (77 percent) have a fair, average, or good likelihood of persistence. One location in the north Central Valley has a poor likelihood of persistence, and four locations (three in the south Central Valley) are uncertain due to the age of surveys, infrequency of surveys, limited habitat, or absence of adult beetles to confirm identification. Because high percentages of beetle locations in both the north and south Central Valleys have a fair, average, or good likelihood of persistence, this suggests no specific concentration of threats occur in the south Central Valley, nor within any given area within the range of the subspecies. Therefore, we conclude that no portion of the beetle's range is impacted to the extent that it warrants an analysis of its biological significance to the subspecies.

It is our conclusion, based on our evaluation of current and future threats to beetle in the north Central Valley and south Central Valley locations (see Summary of Factors Affecting the Species section and Table 2), that the subspecies no longer meets the definition of endangered or threatened under the Act. Our estimates of the persistence of the beetle in those locations (Table 2) confirm that while a variety of threats affect the beetle in all or parts of its range, it nevertheless is likely to persist throughout its range.

Summary of Finding

According to 50 CFR 424.11(d), a species may be delisted if the best scientific and commercial data available substantiate that the species is neither endangered nor threatened because of: (1) Extinction, (2) recovery, or (3) error in the original data for classification of the species. We consider ''recovery'' to apply to the valley elderberry longhorn beetle because habitat protection and restoration efforts in some areas provide assurance that the subspecies and its habitat will continue to persist throughout its range, and additional discoveries of previously unknown beetle populations reduce the overall threat of extinction.

Based on our re-evaluation of the existing or potential threats to the valley elderberry longhorn beetle alone or in combination, we considered:

(1) The number and geographic range of additional locations throughout the Central Valley identified since the time of listing; and

(2) The amount of riparian vegetation restored and protected under numerous programs since the time of listing, again most particularly in the Sacramento Valley.

Based on these factors, we find the valley elderberry longhorn beetle no longer meets the Act's definition of a threatened (or endangered) species. Accordingly, we propose to remove it from the List of Endangered and Threatened Wildlife.

Effects of This Rule

This rule, if made final, would revise 50 CFR 17.11(h) to remove the valley elderberry longhorn beetle from the List of Endangered and Threatened Wildlife, and would also revise 50 CFR 17.95(i) to remove designated critical habitat for the beetle. The prohibitions and conservation measures provided by the Act, particularly section 7 and section 9, would no longer apply to the valley elderberry longhorn beetle. Removal of the valley elderberry longhorn beetle from the List of Endangered and Threatened Wildlife would not supersede any State regulations.

Post-Delisting Monitoring

Section 4(g)(1) of the Act requires the Secretary of the Interior, in cooperation with the States, to implement a system to monitor for not less than 5 years the status of all species that have recovered and been delisted. The purpose of this post-delisting monitoring (PDM) is to verify that a species delisted due to recovery remains secure from risk of extinction after it no longer has the protections of the Act. We are to make prompt use of the emergency listing authorities under section 4(b)(7) of the Act to prevent a significant risk to the well-being of any recovered species. Section 4(g) of the Act explicitly requires us to cooperate with the States in development and implementation of PDM programs, but we remain responsible for compliance with section 4(g) and, therefore, must remain actively engaged in all phases of PDM. We also seek active participation of other entities that are expected to assume

responsibilities for the species' conservation, post-delisting.

Post-Delisting Monitoring Plan Overview

The valley elderberry longhorn beetle's draft PDM plan, required under section 4 of the Act, is designed to monitor the threats to the valley elderberry longhorn beetle by detecting changes in its status and habitat throughout its known range. The draft PDM plan is available for public comment concurrent with publication of this proposed rule in the **Federal Register**. The primary goal of the final PDM Plan is to monitor the species to ensure that any substantial decline in the species occurrences or any increases in threats are detected, and to take measures to halt either so that re-proposing it as a threatened or endangered species is not needed. Both this proposed rule and the draft PDM Plan acknowledge the lack of information available in certain areas (biological and geographical) for this subspecies. Regardless, we are moving forward with a proposed delisting rule for the beetle because we believe sufficient habitat will remain within this range into the foreseeable future and the subspecies no longer meets the definition of endangered or threatened under the Act. Additionally, we believe the beetle will continue to persist based on: (1) The increase in number of beetle occurrence records; (2) increase in number of locations the beetle is found, including over a larger range then what was known at the time of listing; (3) past and ongoing riparian vegetation restoration; and (4) the persistence of elderberry shrubs in these restored areas, as well as a variety of public lands managed for natural values as open space (see the Rangewide Discussion under the Finding section above).

The draft PDM Plan provides information on the goals, duration, implementation, methods, and reporting schedule for monitoring the valley elderberry longhorn beetle. If the final determination is to delist the subspecies, upon publication of a final delisting rule, the Service will convene a Science Panel (see section 4.7 in the Draft PDM Plan) to help develop a detailed monitoring plan, which includes site-specific monitoring plans for each monitoring site established throughout the subspecies' range. This detailed monitoring plan will be developed based on site-specific parameters, including a standardized monitoring protocol. Additionally, there will be recognition of an adaptive management concept in the detailed monitoring plan that outlines how we may potentially revise the monitoring protocols based on new information received. The draft PDM Plan provides direction for the following measures to be implemented for a minimum of 10 years following delisting:

(1) Identifying thresholds that trigger an extension of monitoring, adaptive management changes at protected sites, or a status review.

(2) Continued monitoring of currently known occurrences, and conducting additional surveys to identify occurrences in new locations.

(3) Refining the population and habitat baseline published at time of delisting against which subsequent increases or decreases in occurrences can be compared.

(4) Determining overall and rangewide trends over 10 years of monitoring (with at least 3 of those years consisting of normal rainfall and air temperatures, specifically including trends regarding persistence of the beetle within watersheds and within protected areas such as conservation banks, select established mitigation sites, CDFG Wildlife Areas, the Sacramento NWR, and the San Joaquin River NWR.

(5) Conducting studies to determine the continued amount (such as number of habitat acres or number of individual plants) and effectiveness of restoration efforts after delisting.

(6) Developing an adaptive management strategy.

(7) Creating a science panel to address issues that arise throughout the PDM process.

Examples of specific monitoring objectives or activities described in the draft PDM Plan that address threats discussed in this proposed delisting rule include:

(1) Collecting data variables that will indicate the abundance of suitable beetle habitat potentially available and occupied by the beetle (Factor A);

(2) Counting the number and condition of elderberry shrubs to determine the overall quality of the host plant for the beetle (Factor A);

(3) Monitoring management efforts by land owners to maximize efficiency of overall expenditures and help the Service, science experts, and cooperating partners reprioritize management efforts (Factors A, C, D, and E);

(4) Sampling potential presence of Argentine ants and European earwigs to determine potential site-specific impacts or an increase in magnitude of this potential threat (Factor C);

(5) Monitoring at known locations in addition to monitoring attempts to locate new occurrences, particularly for expanding our knowledge of the subspecies in the southern portion of its range (Factor E);

(6) Determining effectiveness of riparian enhancement and restoration projects (Factor A); and

(7) Collecting data on potential threats, such as implementation or changes in agriculture or other land uses adjacent to the monitoring sites, signs of levee maintenance, changes or impacts from construction or use of roads and trails, fire and fire control, vegetation clearing or control, and herbicide use (Factors A, C, D, and E).

The loss of a valley elderberry longhorn beetle occurrence or location could be an indication of a problem. Therefore, if a beetle location or an important area (such as a large block of beetle habitat) is lost, the potential causes will be investigated and remedial action taken as outlined in the draft PDM Plan. The PDM Plan would accomplish the objectives through cooperation with the appropriate Federal, State, and local agencies; private partners; and species experts, thus fulfilling the goal to prevent the species from needing Federal protection once again, per the Act. We seek public and peer reviewer comments regarding the draft PDM Plan, including its objectives and procedures (see Public Comments section above).

Required Determinations

Regulatory Planning and Review (Executive Orders 12866 and 13563)

Executive Order 12866 provides that the Office of Information and Regulatory Affairs (OIRA) will review all significant rules. The Office of Information and Regulatory Affairs has determined that this rule is not significant.

Executive Order 13563 reaffirms the principles of E.O. 12866 while calling for improvements in the nation's regulatory system to promote predictability, to reduce uncertainty, and to use the best, most innovative, and least burdensome tools for achieving regulatory ends. The executive order directs agencies to consider regulatory approaches that reduce burdens and maintain flexibility and freedom of choice for the public where these approaches are relevant, feasible, and consistent with regulatory objectives. E.O. 13563 emphasizes further that regulations must be based on the best available science and that the rulemaking process must allow for public participation and an open exchange of ideas. We have developed this rule in a manner consistent with these requirements.

Paperwork Reduction Act

The OMB regulations at 5 CFR 1320 implement provisions of the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*). The OMB regulations at 5 CFR 1320.3(c) define a collection of information as the obtaining of information by or for an agency by means of identical questions posed to, or identical reporting, recordkeeping, or disclosure requirements imposed on, 10 or more persons. Furthermore, 5 CFR 1320.3(c)(4) specifies that ''ten or more persons'' refers to the persons to whom a collection of information is addressed by the agency within any 12-month period. For purposes of this definition, employees of the Federal Government are not included. We may not conduct or sponsor and you are not required to respond to, a collection of information unless it displays a currently valid OMB control number.

This proposed rule does not contain any new collections of information that require approval by OMB under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*). This rule will not impose recordkeeping or reporting requirements on State or local governments, individuals, businesses, or organizations. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

National Environmental Policy Act

We have determined that environmental assessments and environmental impact statements, as defined under the authority of the National Environmental Policy Act of 1969, need not be prepared in connection with regulations adopted pursuant to section 4(a) of the Endangered Species Act. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244; October 25, 1983).

Clarity of the Rule

We are required by Executive Orders 12866 and 12988 and by the Presidential Memorandum of June 1, 1998, to write all rules in plain language. This means that each rule we publish must: (a) Be logically organized; (b) Use the active voice to address readers directly; (c) Use clear language rather than jargon; (d) Be divided into short sections and sentences; and (e) Use lists and tables wherever possible. If you feel that we have not met these requirements, send us comments by one of the methods listed in the **ADDRESSES** section. To better help us revise the rule, your comments should be as specific as possible. For example, you should tell us the numbers of the sections or paragraphs that are unclearly written, which sections or sentences are too long, the sections where you feel lists or tables would be useful, etc.

References Cited

A complete list of all references cited in this rule is available on the Internet at *http://www.regulations.gov* or upon request from the Field Supervisor, Sacramento Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this document are the staff of the Sacramento Fish and Wildlife Office (see **FOR FURTHER INFORMATION CONTACT**).

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

Proposed Regulation Promulgation

Accordingly, we propose to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 16 U.S.C. 1531–1544; 16 U.S.C. 4201–4245; Pub. L. 99–625, 100 Stat. 3500; unless otherwise noted.

§ 17.11 [Amended]

2. Amend § 17.11(h) by removing the entry ''Beetle, valley elderberry longhorn'' under ''INSECTS'' from the List of Endangered and Threatened Wildlife.

§ 17.95 [Amended]

3. Amend § 17.95(i) by removing the critical habitat entry for ''Valley Elderberry Longhorn Beetle (*Desmocerus californicus dimorphus*).''

Dated: September 12, 2012.

David Cottingham,

Acting Director, U.S. Fish and Wildlife Service.

[FR Doc. 2012–23843 Filed 10–1–12; 8:45 am]

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