DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R8–ES–2011–0063]

[FXES11130900000C2-123-FF09E32000]

RIN 1018–AV29

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

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule; withdrawal.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), withdraw the proposed rule to remove the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) from the Federal List of Endangered and Threatened Wildlife under the

Endangered Species Act of 1973 (Act), as amended. This withdrawal is based on our determination that the proposed rule did not fully analyze the best available information. We find the best scientific and commercial data available indicate that the threats to the species and its habitat have not been reduced to the point where the species no longer meets the statutory definition of an endangered or threatened species.

DATES: The Service is withdrawing the proposed rule published October 2, 2012 (77 FR 60238) as of [INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES: The withdrawal of our proposed rule, comments and materials we received, and supplementary documents are available on the Internet at *http://www.regulations.gov* at Docket No. FWS–R8–ES–2011–0063. All comments, materials, and supporting documentation that we considered in this final agency action are available by appointment, during normal business hours, at: U.S. Fish and Wildlife Service, Sacramento Fish and Wildlife Office, 2800 Cottage Way, Suite W–2605, Sacramento, California 95825; telephone 916–414–6600; or facsimile 916–414–6713.

FOR FURTHER INFORMATION CONTACT: Jennifer Norris, Field Supervisor, Sacramento Fish and Wildlife Office (see **ADDRESSES** section). Persons who use a telecommunications device for the deaf (TDD) may call the Federal Information Relay Service (FIRS) at 800–877–8339.

SUPPLEMENTARY INFORMATION:

Executive Summary

Why we need to publish this document. Section 4 of the Act and its implementing regulations (50 CFR 424) set forth the procedures for revising the Federal Lists of Endangered and Threatened Wildlife and Plants. Rulemaking is required to remove a species from the Federal Lists of Endangered and Threatened Wildlife and Plants, accordingly, we issued a proposed rule and 12-month petition finding on October 2, 2012 (77 FR 60238) 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 for the subspecies. Based upon our review of public comments, comments from various Federal, county, and local agencies, peer review comments, comments from other interested parties, and new information that became available since the publication of the proposal, we reevaluated information in our files and our proposed rule. This document withdraws the proposed rule because the best scientific and commercial data available, including our reevaluation of information related to the species' range, population distribution, and population structure, indicate that threats to the species and its habitat have not been reduced such that removal of this species from the Federal List of Endangered and Threatened Wildlife is appropriate.

The basis for our action. A species may warrant protection under the Act if it is found to be endangered or threatened throughout all or a significant portion of its range. A species may be determined to be an endangered species or threatened species because of one or

more of the five factors described in section 4(a)(1) of the Act: (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. Based on our evaluation of the best scientific and commercial data available pertinent to threats currently facing the species and threats that could potentially affect it in the foreseeable future, we determine that threats have not been reduced such that the species no longer meets the statutory definition of an endangered or threatened species.

Peer review and public comment. We sought peer review comments from independent specialists to ensure that our proposed delisting designation was based on scientifically sound data, assumptions, and analyses. We invited these peer reviewers to comment on our proposal to remove the valley elderberry longhorn beetle from the Federal List of Endangered and Threatened Wildlife. We also considered all other comments and information received during the public comment periods.

Acronyms and Abbreviations Used in This Document

We use many acronyms and abbreviations throughout this proposed rule. To assist the reader, we provide a list of these here for easy reference:

Act = Endangered Species Act of 1973

AFB = Air Force Base

BDCP = Bay Delta Conservation Plan

Cal-IPC = California Invasive Plant Council

CCP = Comprehensive Conservation Plan

CDFG = California Department of Fish and Game (see below)

CDFW = California Department of Fish and Wildlife (formerly CDFG)

CDPR = California Department of Pesticide Regulation

CDWR = California Department of Water Resources

CEQA = California Environmental Quality Act

CFG = California Fish and Game

CFR = Code of Federal Regulations

CNDDB = California Natural Diversity Database

Corps = Army Corps of Engineers

CNLM = Center for Natural Lands Management

CVFPP = Central Valley Flood Protection Plan

CVRMP = Central Valley Riparian Mapping Project

CWA = Clean Water Act

CWP = California Water Plan

DOD = Department of Defense

EO = Element Occurrence

ETL = (Army Corps of Engineers) Engineering Technical Letter

EPA = Environmental Protection Agency

EWPP = Emergency Watershed Protection Program

FR = Federal Register

GCM = global climate model

GHG = greenhouse gas

GIC = Geographic Information Center

GIS = Geographic Information System

HCMP = Habitat Conservation Management Plan

HCP = Habitat Conservation Plan

HRMMP = Habitat Restoration, Monitoring, and Management Program

INRMP = Integrated Natural Resources Management Plan

IPCC = Intergovernmental Panel on Climate Change

LSA = Lake and Streambed Alteration

NAIP = National Agriculture Imagery Program

NEPA = National Environmental Policy Act

NCCP = Natural Community Conservation Planning

NRCS = Natural Resources Conservation Service

NWR = National Wildlife Refuge

PG&E = Pacific Gas and Electric Company

PGL = (Army Corps of Engineers) Policy Guidance Letter

PVA = Population Viability Analysis

SAMP = Special Area Management Plan

Service = U.S. Fish and Wildlife Service

SPFC = The (California) State Plan of Flood Control

USBR = U.S. Bureau of Reclamation

USDA = U.S. Department of Agriculture

USGS = U.S. Geological Survey

WRCC = Western Regional Climate Center

WRP = Wetland Reserve Program

WRRDA = Water Resources Reform and Development Act

Summary of Changes From the Proposed Rule

Based upon our review of public comments, comments from various Federal, county, and local agencies, peer review comments, comments from other interested parties, and new information that became available since the publication of the proposal (77 FR 60238; October 2, 2012), we reevaluated information in our files and our proposed rule, making changes as appropriate in this document. Where appropriate, we incorporated new information that became available since publishing the proposed rule, information received during the public comment periods, and in some cases provided additional discussion of information in our files that may not have been presented in adequate detail in the proposed rule. This document also provides important clarifications on the species' biology and threats to the species. Thus, this determination differs from the proposed rule as outlined below.

(1) Based on the results of the information received from peer reviewers and the public, we concluded that some species distribution information in the proposed rule was incorrectly presented. As a result, we reevaluated the quality of distribution information

(occurrences) for the valley elderberry longhorn beetle that was included in our previous summaries (e.g., Valley Elderberry Longhorn Beetle Recovery Plan (Recovery Plan) (Service 1984, entire); proposed and final listing rules (43 FR 35636; August 10, 1978; 45 FR 52803; August 8, 1980); 5-year review (Service 2006a); and proposed delisting rule (77 FR 60238; October 2, 2012)). This required a reanalysis of the original data sets in our files throughout the range of the species.

(2) As a result of (1) above and our review of additional sources of information received during the open public comment periods, we reexamined existing information in our files. In this document, we provide either clarifications where necessary, additional or revised discussions where appropriate (e.g., *Population Distribution* and *Current Distribution* sections under **Background**), or incorporate and discuss new information received (e.g., Climate Change and Pesticide discussion under *Factor E*, preliminary survey results using aggregation pheromones under *Population Structure* in **Background**).

(3) As a result of (1) and (2) above, as well as information received after the proposed rule published, we reevaluated and revised our description of the valley elderberry longhorn beetle's life history, and its population distribution, range, and occupancy. Our revised discussions are provided throughout the **Background** section.

(4) We revised the **Summary of Factors Affecting the Species** section, incorporating new or revised information, where appropriate, in our assessments for these

factors. The substantial changes to the **Background** section required us to complete a detailed examination of the five-factor analysis information presented in the proposed rule for each threat to determine whether the discussions were still valid or required revisions. Thus, our threats analysis and associated summaries may differ, where appropriate, from that presented in the proposed rule.

The primary changes to this document as compared to the proposed rule are the result of our reanalysis of occurrence and distribution information of the valley elderberry longhorn beetle. Specifically, we restructured the five-factor analysis from our proposed rule to reflect our reanalysis of threats, including additional and more detailed information (e.g., invasive plants in *Factor A* and pesticides under *Factor E*). We provide a more extensive discussion of effects related to climate change in *Factor A*, and incorporate predictions from several regional climate models for the Central Valley region. We also incorporate detailed results of several studies (e.g., metapopulation analysis) and use this information to evaluate the current threats to the species. Finally, threats related to the effects of pruning (briefly mentioned in our proposed rule under a *Factor E* threat (Human Use) (77 FR 60263; October 2, 2012)) are discussed in this withdrawal under *Factor A*.

(5) Based on our reanalysis and the changes described above under (1) through (4), and primarily as a result of the revised occurrence and distribution information that affects our evaluation of the factors impacting the species, we determined that the current and future threats are of sufficient imminence, intensity, or magnitude to indicate that the

valley elderberry longhorn beetle is likely to become endangered within the foreseeable future throughout all of its range. Therefore, the valley elderberry longhorn beetle currently meets the definition of a threatened species, and we are withdrawing the proposed rule to delist the valley elderberry longhorn beetle.

Background

Previous Federal Actions

Please refer to the *Previous Federal Actions* section of the valley elderberry longhorn beetle proposed delisting rule (77 FR 60238, October 2, 2012) for a detailed description of the previous Federal actions concerning this species. On October 2, 2012, we proposed to remove the designation of the valley elderberry longhorn beetle as a threatened species under the Act (77 FR 60238). We opened a 60-day public comment period on the proposed rule that closed on December 3, 2012. On January 23, 2013 (78 FR 4812), we announced a 30-day reopening of the public comment period for our October 2, 2012, proposed delisting rule for the species.

Taxonomy and Species Description

The valley elderberry longhorn beetle, *Desmocerus californicus dimorphus*, is a member of the family Cerambycidae, subfamily Lepturinae, and genus *Desmocerus* (Chemsak 2005, pp. 6–7); adults are approximately 0.5 to 0.8 inches (in) (13 to 21

millimeters (mm)) long (Chemsak 2005, p. 6). In North America, the genus *Desmocerus* includes three species (*D. palliatus*, *D. californicus*, *D. aureipennis*) and six subspecies (*D. c. californicus, D. c. dimorphus*, *D. a. aureipennis, D. a. cribripennis, D. a. piperi, D. a. lacustris*) in the United States and Canada (Chemsak 2005, pp. 4–12). Members of the genus *Desmocerus* are brightly colored and sexually dichromatic with antennal tubules that are not prominently produced at the apex (Chemsak 2005, pp. 2–3). The protonum (upper surface of the prothorax segment; the midsection (Evans and Hogue 2006, p. 293)) of the two *Desmocerus californicus* subspecies differ from the other two North American species (*D. palliatus*, *D. aureipennis*) with a disk that is densely, confluently punctate (with small depressions on the disk that flow or run together), but without large, irregular, and transverse rugae (ridges) that are about twice as long as broad (Chemsak 2005, p. 3).

Along the foothills of the eastern edge of the California coast range and in the southern San Joaquin Valley, the valley elderberry longhorn beetle range may overlap or abut portions of its range with the similar-looking California elderberry longhorn beetle (*Desmocerus californicus californicus*) (Talley *et al*. 2006a, p. 5). Prior to 1972, the valley elderberry longhorn beetle was considered a separate and valid species (Halstead and Oldham 2000, p. 74). The two elderberry longhorn beetles are now considered two subspecies (Linsley and Chemsak 1972, pp. 7–8; Chemsak 2005, pp. 5–6). Valley elderberry longhorn beetle experts indicate that the small number of available specimens limits the ability to distinguish between the two types based on characteristics such as body length, elytra length and width, and antennal hair color (Talley *et al*. 2006a, p. 5). Thus, the two subspecies can be identified with certainty only by the adult male

coloration, such that valley elderberry longhorn beetle males have predominantly red elytra (wing cases) with four dark spots, while California elderberry longhorn beetle males have dark metallic green to black elytra with a red border; females of the two subspecies are similar in appearance (Talley *et al*. 2006a, p. 4). Atypically colored (mostly dark) male elderberry longhorn beetles have been observed in both the center and eastern edge of the valley elderberry longhorn beetle's range (Talley *et al*. 2006a, p. 5). Talley *et al*. (2006a, p. 7) recommend a systematic geographic morphological and genetic study to determine the degree of overlap and interbreeding between the two subspecies.

The obligate larval host plants for both elderberry longhorn beetles have been described as blue elderberry (*Sambucus mexicana*) and, to a lesser extent for the valley elderberry longhorn beetle, red elderberry (*Sambucus racemosa*) (Collinge *et al*. 2001, p. 104; Holyoak 2010, p. 1). However, the current treatment of *Sambucus* in California (Family Adoxaceae) describes three taxa: blue elderberry (*S. nigra* subsp. *caerulea*), black elderberry (*S. racemosa* var. *melanocarpa*), and red elderberry (*S. racemosa* var. *racemosa*) (Bell 2012, p. 160). As noted previously by others (e.g., Talley *et al*. 2006a, p. 15), the taxonomic status of *Sambucus* is imprecise, and blue elderberry is currently described as "variable" and in need of further study (Bell 2012, p. 160). In this rule, we use the more general term, elderberry, to describe the host plant for the valley elderberry longhorn beetle since many of the elderberry surveys and their reported results do not distinguish, or do not identify, the two taxa known to be occupied by the valley elderberry longhorn beetle (i.e., blue elderberry and red elderberry). Local climate differences between the more coastal region occupied by the California elderberry

longhorn beetle and the California Central Valley occupied by the valley elderberry longhorn beetle may promote different phenologies (e.g., flowering time) of the host plant and, therefore, differences in time of emergence for the two subspecies (Talley *et al*. 2006a, p. 6).

Life History

Similar to other beetles, the valley elderberry longhorn beetle goes through several developmental stages. These include an egg, four larval stages (known as "instars," with each instar separated by molting), pupa, and adult (Greenberg 2009, p. 2).

As reported by Arnold (1984, p. 4), females lay eggs singly on elderberry leaves and at the junction of leaf stalks and main stems, with all eggs laid on new growth at the outer tips of elderberry branches. Based on observations of *Desmocerus californicus* females along the Kings River, Halstead and Oldham (1990, p. 24) stated that females laid eggs at locations on the elderberry branch where the probing ovipositor (i.e., the female's egg-laying organ) could be inserted. In a laboratory setting, Barr (1991, p. 46) found that the majority of eggs laid by a female valley elderberry longhorn beetle were attached to leaves and stems of foliage (provided as food), with a preference for leaf petiole-stem junctions, leaf veins, and other areas containing crevices and depressions. Eggs are approximately 0.09 to 0.12 in (2.3 to 3.0 mm) long and reddish-brown in color with longitudinal ridges (Barr 1991, p. 4). Eggs are initially white to bright yellow (Talley *et al*. 2006a, p. 8) and then darken to brownish white and reddish brown (Burke

1921, p. 451). Results of captive studies of *Desmocerus californicus* indicate the number of eggs produced per female vary, ranging from 8 to 110 (Burke 1921, p. 25; Arnold 1984, p. 4; Barr 1991, p. 51). Talley (2003, pp. 153–157) recorded a total of 136 larvae (and an additional 44 eggs that did not hatch) from one captive female valley elderberry longhorn beetle collected in 2002. Hatching success has been estimated at 50 to 67 percent of eggs laid, but survival rates of larvae are unknown (Talley *et al*. 2006a, p. 7).

In a laboratory setting eggs hatched within a few days of oviposition (Talley 2003, p. 145), but in the natural setting, the time to eclosing (development from egg to first instar larvae) is unknown (Barr 1991, pp. 4–5). Based on laboratory observations, the first instar larvae may bore immediately into the green tissue of the elderberry stem at or near the egg site, or larvae may persist on the shrub surface for several hours (Halstead and Oldham 1990, p. 26). Previous studies of both subspecies of *Desmocerus californicus* (Burke 1921, p. 450; Linsley and Chemsak 1972, p. 4) estimated that the larval development rate inside the plant is 2 years, but laboratory observations have indicated that a 1-year cycle is possible (Halstead and Oldham 1990, p. 26). The boring of the larva creates a feeding gallery (set of tunnels) in the pith at the stem center (Burke 1921, p. 450; Barr 1991, pp. 4–5). While only one larva is found in each feeding gallery, multiple larvae can occur in one stem if the stem is large enough to accommodate multiple galleries (Talley *et al*. 2006a, p. 8). Prior to pupation, the final (fifth) instar larva chews a larger pupal cavity in the pith of the stem and creates an exit burrow through the hardwood just below the surface of the bark of the plant, creating an exit hole (Halstead and Oldham 1990, p. 23), but then returns inside the plant stem, plugging the

hole with wood shavings (also known as frass) (Talley *et al*. 2006a, p. 8). These larvae move back down the feeding gallery to the enlarged pupal chamber packed with frass, where they metamorphose into pupae between January and April (Burke 1921, p. 452). Approximately 1 month later, they metamorphose into an adult, although the adult form may remain in the cavity for several weeks (Burke 1921, p. 452). The adults chew through the outer bark and emerge in the spring or early summer through the exit hole, generally coinciding with the flowering season of the elderberry (Burke 1921, p. 450; Halstead and Oldham 1990, p. 23).

Several studies or surveys have documented the presence of potential predators (e.g., earwigs, native and nonnative ants) of valley elderberry longhorn beetle larvae on elderberry shrubs or within stems (Barr 1991, p. 44; Huxel 2000, pp. 83–84; Holyoak and Graves 2010, pp. 16–17). The Argentine ant (*Linepithema humile*) is an invasive, nonnative species that has successfully colonized many areas of California (Vega and Rust 2001, p. 5), including permanent stream systems in parts of the Central Valley (Ward 1987, pp. 7–8; Huxel 2000, p. 84; Klasson *et al*. 2005, pp. 7–8). Nectar and honeydew are important food sources for Argentine ants, but studies of feeding behavior have found that Argentine ants are opportunistic feeders that readily forage on protein sources such as insect larvae or pupae, when available (Rust *et al*. 2000, p. 209). For example, Way *et al*. (1992, pp. 428–431) found that Argentine ants easily located and removed exposed eggs laid by another arboreal insect borer (*Phoracantha semipunctata* (Coleoptera: Cerambycidae)) in studies conducted in eucalyptus stands in Portugal. See

Summary of Factors Affecting the Species section below for additional discussion of predation threats to the valley elderberry longhorn beetle.

Collection records indicate that adult valley elderberry longhorn beetles can be observed from mid-March until early-June, though most records are from late-April to mid-May (Service 1984, p. 7). However, the adult stage is rare, both in space and time (Talley *et al*. 2006b, p. 649); adults likely die within 3 months (Halstead and Oldham 1990, p. 22). In a laboratory setting, Arnold (1984, p. 4) recorded females living up to 3 weeks, but males lived no more than 4 or 5 days. Similarly, Barr (1991, p. 46) described a life span of 17 days for a captive male and 25 days for two captive females. Halstead and Oldham (1990, p. 25) recorded caged adults living from 4 to 66 days in their experimental studies.

The exit holes created in elderberry stems by the emerging adult eventually heal, but distinct scars remain on the plant stem (Talley *et al*. 2006a, p. 9). Although the presence of exit holes is used to survey and estimate population size for the valley elderberry longhorn beetle (Talley *et al*. 2006a, p. 10) (see additional discussion in *Population Distribution* section), this survey technique can be problematic as an estimate of occupancy for several reasons. First, the exit holes of both the valley elderberry longhorn beetle and the California elderberry longhorn beetle are reported to be identical and both beetles use the same elderberry taxa as their host plants (Arnold 2014b, pers. comm.), making it difficult to determine occupancy of the two subspecies in areas where their ranges may overlap. Second, surveys may have included observations of exit holes

in dead stems, rather than only those found in live elderberry stems even though the species uses only live host plants. Third, once an elderberry stem is abandoned by the valley elderberry longhorn beetle, other species can occupy the holes and fill them with frass, making it difficult to confirm that the feeding chamber was created by the valley elderberry longhorn beetle (Talley *et al*. 2006a, p. 10). Finally, birds may also enlarge or rework valley elderberry longhorn beetle exit holes making them difficult to identify as such (Jones and Stokes Associates 1987, p. 38).

Adult Behavior and Ecology

Because of the species' rarity, its short-lived adult form, and difficulty in observing adults in the field, few studies document the behavior of adult valley elderberry longhorn beetles. Where observed, adults have been described as feeding on the nectar, flowers, and leaves of the elderberry plant (Arnold 1984, p. 4; Collinge *et al*. 2001, p. 105), or flying between trees (Service 1984, p. 7). Mating likely begins fairly quickly upon emergence. In field studies conducted in the north Sacramento area, Arnold (1984, p. 4) noted that male adult valley elderberry longhorn beetles appear more active than female adults, and males were observed taking short flights both within elderberry shrubs or to another shrub.

Dispersal distances for the valley elderberry longhorn beetle are unknown. Based on site occupancy and patterns of colonization and extinction from 1991 to 1997, Collinge *et al*. (2001, p. 111) concluded that the valley elderberry longhorn beetle has

limited dispersal ability. In this and following sections (i.e., *Adult Behavior and Ecolo*gy, *Population Structure*, and *Summary* under **Background**), the term "extinction" refers to the observations defined and described in the original citations (e.g., Collinge *et al*. 2001, entire, and Zisook 2007, entire), and does not refer to extinction of the valley elderberry longhorn beetle. Talley *et al*. (2007, p. 28) concluded the abundance of exit holes was spatially clustered over distances of 33 to 164 feet (ft) (10 to 50 meters (m)) in alluvial plain, riparian corridors, and upper riparian terrace habitats along portions of the American River Basin. In this same study, the average distance between the nearest neighboring (recent) exit hole was estimated at 141 ft (43 m); however, there was a wide range in the distances measured (plus or minus 144 ft (44 m)) (Talley *et al*. 2007, p. 28), making it difficult to draw definitive conclusions for this spatial relationship. Based on these data, Talley *et al*. (2007, p. 28) estimated the dispersal distance of an adult valley elderberry longhorn beetle from its emergent site to be 164 ft (50 m) or less (Talley *et al*. 2007, p. 28). However, Arnold (2014a, pers. comm.) has observed males flying at least 1 mile (mi) (1.6 kilometers (km)) in areas of good habitat. Given the varying results of these studies (i.e., Collinge *et al*. 2001; Talley *et al*. 2007; Arnold 2014a, pers. comm.) and lack of comprehensive studies of adult behaviors (e.g., mark and recapture studies), we are not able to accurately define a precise dispersal distance or assess how dispersal or other behaviors affect population persistence for this species. However, we believe that the dispersal ability for this species range is fairly limited.

Habitat

The valley elderberry longhorn beetle occupies portions of the Central Valley of California (also known as the Great Valley of California). The Central Valley is bounded by the Cascade Range to the north, the Sierra Nevada to the east, the Tehachapi Mountains to the south, and the coastal ranges and San Francisco Bay to the west. The valley is a large agricultural region drained by the Sacramento and San Joaquin Rivers and represents one of the more notable structural depressions in the world with much of the valley close to sea level in elevation with very low land surface relief, though elevations are higher along the valley margins (U.S. Geological Survey (USGS) 2013a). The climate in the Sacramento Valley and the San Joaquin Basin, which comprise the northern two-thirds of the Central Valley, can be characterized by cool, rainy winters and hot, dry summers (USGS 2013a). The average annual rainfall for the Central Valley ranges from 5 inches (12.7 centimeters (cm)) at the southern end to over 30 inches (76.2 cm) at the northern end (U.S. Bureau of Reclamation (USBR) 2014). With more than three-quarters of this rain coming during a 5-month period (December through April), seasonal floods are common in the valley due to heavy winter and spring runoffs. This precipitation pattern often creates water shortages in the summer and fall when rain is most needed for irrigation purposes; in low rainfall years, drought conditions are often observed in the valley (USBR 2014).

In addition to rain falling within the valley itself, snowpack in the Sierra Nevada Mountains to the east historically provided flows from numerous rivers and streams into both the Sacramento Valley and the San Joaquin Valley through late spring (Katibah

1984, p. 24). These river systems have been altered by artificial levees, river channelization, dam construction, and water diversions (Katibah 1984, p. 28).

The primary host plant of the valley elderberry longhorn beetle, blue elderberry, is an important component of riparian ecosystems in California (Vaghti *et al*. 2009, p. 28). As part of the remnant riparian forests in the Central Valley, elderberry provides wintering, foraging, and nesting habitat for birds (Gaines 1974, entire; Gaines 1980, entire) and supporting habitat for other boring insects and spiders (Barr 1991, p. 44). Its berries, leaves, and flowers provide food for wildlife, particularly during dry summer months (Vaghti *et al*. 2009, pp. 28–29). Elderberry seeds are likely dispersed by vertebrates, particularly birds (Talley 2005, p. 57). Elderberry seedlings have shallow roots, and high rates of mortality have been observed in the field (Talley 2005, p. 57). Lower seedling mortality rates (about 25 percent in the first year of planting) have been reported from areas where elderberry plants have been transplanted or where new elderberry seedlings have been planted (i.e., mitigation sites) where site conditions are managed (Holyoak *et al*. 2010, p. 48).

A 1991 survey for the valley elderberry longhorn beetle between the Central Valley and adjacent foothills recorded elderberry plants (i.e., both red and blue elderberry) in habitats ranging from lowland riparian forest to foothill oak woodland, with elevation ranges from 60 to 2,260 ft (18.3 to 689 m) (Barr 1991, p. 37). Historically, the riparian forests in the Central Valley consisted of several canopy layers with a dense undergrowth and included Fremont cottonwood (*Populus fremontii*),

California sycamore (*Platanus racemosa*), willows (*Salix* sp.), valley oak (*Quercus lobata*), box elder (*Acer negundo* var. *californicum*), Oregon ash (*Fraxinus latifolia*), and several species of vines (e.g., California grape (*Vitis californica*) and poison oak (*Toxicodendron diversilobum*)) (Service 1984, p. 6). These plant communities encompass several remaining natural and semi-natural floristic vegetation alliances and associations within the Great Valley Ecoregion of California (see Buck-Diaz *et al*. 2012, pp. 12–23). The 1991 survey conducted by Barr noted that elderberry was found most frequently in mixed plant communities, and in several types of habitat, including non-riparian locations, as both an understory and overstory plant (Barr 1991, pp. 40–41) with adults and exit holes created by the valley elderberry longhorn beetle found most commonly in riparian woodlands and savannas (Barr 1991, p. 41). Based on surveys completed along the Sacramento River, Gilbart (2009, p. 51) concluded that the valley elderberry longhorn beetle shows a preference for moderate amounts of cover, but that its occupancy is reduced with some canopy-producing plants, such as box elders, cottonwoods, and willows.

Nonnative plants observed in vegetation communities containing elderberry include giant reed (*Arundo donax*), brome (*Bromus* spp.), and bur chervil (*Anthriscus caucalis*) (Vaghti *et al*. 2009, pp. 33–35). Black locust (*Robinia pseudoacacia*) and black walnut (*Juglans hindsii*) have been identified as important invasive species that can displace native plants in riparian floodplains in the Central Valley (Hunter 2000, p. 275; Vaghti *et al*. 2009, pp. 33–35) (see **Summary of Factors Affecting the Species** section below).

Talley *et al*. (2006a, p. 10) stated that the valley elderberry longhorn beetle is found most frequently and most abundantly in areas that support significant riparian zones (see also Talley *et al*. 2007, discussed below). In a study to evaluate the occupancy of the valley elderberry longhorn beetle (based on exit hole observations) in roadside habitats in the northern Central Valley (2006–2008), Talley and Holyoak (2009, p. 8) found that site occupancy rates and rates of elderberry shrub occupancy within occupied sites were higher in riparian vegetation compared with non-riparian vegetation. Hydrological processes, specifically inundation duration and frequency, when measured by relative elevation above a river or creek floodplain, were found to significantly influence the distribution of elderberry in the lower alluvial reaches of the American River, Cache Creek, Cosumnes River, and Putah Creek (Talley 2005, pp. 52, 55, 66). The highest frequency of elderberry shrubs was found within an intermediate relative elevation gradient, that is, between areas influenced by flooding processes (low elevations) and water availability (higher elevations) (Talley 2005, pp. 45, 66). Talley (2005, pp. 56–58) also noted that the differences in relationships between elderberry abundance (number of shrubs within each elderberry patch), lateral size (shrub diameter), and stress level (proportion of dead stems per shrub) within the four river systems studied were attributed to stochastic (random) processes related to seed dispersal patterns and seedling mortality.

Several studies have evaluated specific elderberry plant characteristics (e.g., size of stems, density of stems, and height above ground) relative to the valley elderberry

longhorn beetle's life-history requirements and its abundance or presence (Jones and Stokes Associates 1987, pp. 27–32; Barr 1991, pp. 37–42; Collinge *et al*. 2001, pp. 107–109; Talley 2005, pp. 14–15, 17–19; Talley *et al*. 2007, entire; Holyoak and Koch-Munz 2008, entire). A detailed analysis of habitat and habitat quality for the valley elderberry longhorn beetle was completed based on surveys from 2002 to 2004 within one section of the American River Basin (American River Parkway) (Talley *et al*. 2007, entire). The study identified several predictors of habitat occupancy in the area surveyed and found that, in general, density of elderberry shrubs and shrub size, number of stems, and range of branch sizes were the most influential predictor variables (Talley *et al*. 2007, p. 30). Valley elderberry longhorn beetle exit holes were observed most frequently in elderberry stems or branches with a diameter of (0.8 to 2.76 inch (2 to 7 cm) and at a height of 0 to 3.28 ft (0 to 1 m) above ground, which may be the result of the size of the main stems of elderberry shrubs (Talley *et al*. 2007, p. 30). Of the four types of habitats evaluated within the study area, riparian cover types contained the greater quality of habitat, specifically upper riparian terrace and lower alluvial plain habitats (Talley *et al*. 2007, p. 30).

There are limited studies on the relationship of the valley elderberry longhorn beetle's life-history features and those of its host plants, and the significance of this relationship to the ecology of riparian or other native plant communities where the species is found. Based on comprehensive surveys of elderberry taxa surveyed within the Central Valley in 1991, Barr (1991, p. 50) concluded that the presence of the valley elderberry longhorn beetle was not a factor in the health of elderberry host plants, nor

were unhealthy host plants a factor determining the presence of the beetle. Gilbart (2009, entire) evaluated the relationship between the occupancy of the valley elderberry longhorn beetle and the health of blue elderberry planted at restoration sites along the Sacramento River (within the Sacramento River National Wildlife Refuge (NWR)). Results from this study found a correlation between occupancy and dead biomass (versus between occupancy and age), which supports results from other studies regarding the valley elderberry longhorn beetle's preference for plants with partial bark damage or that are otherwise stressed (e.g., low to moderate levels of damaged stems from pruning or burning), or for shrubs with, on average, 25 to 50 percent dead stems (Arnold 1984, p. 4; Holyoak and Koch-Munz 2008, pp. 447–448).

Gilbart (2009, p. 54) stated that valley elderberry longhorn beetles likely use olfaction to locate host plants and mates, and volatiles released from the stressed tissue in elderberry shrubs are likely to be the initial cue used for host plant and mate location. This analysis also found that, although the exit holes created by the valley elderberry longhorn beetle may increase the dead biomass of elderberry shrubs, an increase in plant cover has a greater effect on dead biomass and is independent of the occupancy of the beetle (Gilbart 2009, pp. 53–54). Additional studies are needed to determine the relationships between the valley elderberry longhorn beetle's occupancy and: (1) The regenerative ability and timing of elderberry stem growth; (2) the beetle's observed preference for elderberry stems of a certain minimum diameter relative to the host plants' life history; and (3) other factors related to the ecological role of elderberry found in the species' range in the Central Valley.

In an unpublished evaluation of environmental factors important to the valley elderberry longhorn beetle, Zisook (2007, entire) evaluated colonization and extinction events based on survey data from the Talley *et al*. (2007, entire) study along the American River Parkway. Zisook (2007, p. 5) found that colonization events were more likely to occur on shrubs located on north-facing slopes and on relatively large and previously occupied shrubs. Extinction events were more likely to be associated with relatively small elderberry shrubs, shrubs with stem damage, and in areas with larger floodplain widths (Zisook 2007, p. 5). In their evaluation of elderberry characteristics at mitigation sites compared with natural sites, Holyoak and Koch-Munz (2008, pp. 449–450) noted that, within mitigation sites, the abundance of the valley elderberry longhorn beetle *per elderberry shrub* was positively related to the size and age of the mitigation site, and the species was more likely to be present in elderberry shrubs with low levels of damage (e.g., partial bark damage) at these sites (see also discussion in *Adult Behavior and Ecology* section above). Relatedly, Talley *et al*. (2007, p. 28) found that the presence of recent exit holes was correlated with previous occupancy (that is, 73 percent of elderberry shrubs with recent holes also had old holes). A similar result was found in a 2010 survey effort, in which all but one watershed sampled had both new holes and old holes (in both dead and live wood) (Holyoak and Graves 2010, p. 12). Additional habitat characteristics relative to spatial relationships of elderberry shrubs and occupancy of the valley elderberry longhorn beetle are summarized in our metapopulation structure discussion (see *Population Distribution* section below).

Population Distribution

There are few recorded observations of adult valley elderberry longhorn beetles; many of the locations for this species in various references, including previous Service documents, are based exclusively on observations of exit holes. The population distribution of the valley elderberry longhorn beetle described in our proposed delisting rule (77 FR 60238; October 2, 2012) relied heavily on the records provided in the California Natural Diversity Database (CNDDB) as Element Occurrences (EOs). The CNDDB, maintained by the California Department of Fish and Wildlife (CDFW; formerly known as California Department of Fish and Game (CDFG)), is an ongoing effort to include observations and survey reports for separate EOs of all of the species and subspecies tracked by the database. However, because contribution to the database is not mandatory, some observations or surveys as well as negative survey results for plants and animals (including the valley elderberry longhorn beetle) are not included in the database; therefore, the CNDDB should not be considered an exhaustive or comprehensive inventory of all rare species in California (CDFW 2014c). For animals with limited mobility, which includes most invertebrates, an EO is defined as a location where a specimen was collected or observed, and is assumed to represent a sample of a breeding population (CDFG 2007, p. 1). Sequential surveys are accumulated in EO reports for each location of a species.

There are important limitations to consider when using the CNDDB records to examine the population distribution and abundance of the valley elderberry longhorn

beetle. First, despite the date (year) of the observations, CNDDB considers all occurrences of the valley elderberry longhorn beetle as presumed extant, even though many of these records are more than 20 years old. Second, the occurrence rank (a measure of the condition and viability of a particular occurrence that takes into account population size, viability, habitat quality, and disturbance) used by CNDDB (based on NatureServe definitions; NatureServe 2014) for many of the valley elderberry longhorn beetle EOs are considered "poor" (occurrence has a high risk of extirpation) or "unknown" (rank not assigned due to lack of sufficient information on the occurrence). In addition, many of the records described in the CNDDB report represent only observations of exit holes. As noted above in *Life History* section, these observations may represent: (1) Old exit holes created by the valley elderberry longhorn beetle; (2) exit holes created by the California elderberry longhorn beetle within areas where their ranges overlap; or (3) holes created by other species.

Our review of the 2013 CNDDB EO report for the valley elderberry longhorn beetle found that 72 percent (142 of 196) of the EOs represent observations of only exit holes, and 23 percent (46 of 201) of the EOs are described as adult beetles (male, female, or unknown sex) (CNDDB 2013, entire; Arnold 2014a, pers. comm.). Only 12 percent (24 of 201) of the EOs identify observations of adult males (CNDDB 2013, entire; Arnold 2014a, pers. comm.), and four of these records (within Tulare County) are likely to be observations of the California elderberry longhorn beetle since no typically colored male specimens have been observed or collected from this County (Talley *et al*. 2006a, p. 5).

Presumed Historical Range

Prompted by comments received from peer reviewers, local agencies, the public, and other interested parties during our two open comment periods on the proposed delisting rule (77 FR 60238; October 2, 2012: 78 FR 4812; January 23, 2013), and our reassessment of the CNDDB occurrences (CNDDB 2013, entire), and other references (e.g., elderberry mitigation or conservation banks, biological opinions prepared by the Service, and other unpublished reports), we are defining in this withdrawal notice the presumed historical range of the valley elderberry longhorn beetle based on:

(1) A georeferenced version (Service 2014, Geographic Information System (GIS) analysis) of the distribution map illustrated in Chemsak (2005, p. 7).

(2) The distribution defined in Talley *et al*. (2006a, pp. 4–6), which was based on museum specimens and sightings of adult males.

(3) The distribution map (also georeferenced) of museum and other specimens depicted in Halstead and Oldham (1990, p. 51 (Figure 22)).

(4) Locations of observations of adult male valley elderberry longhorn beetles described in the CNDDB report (CNDDDB 2013, entire) or in other survey results not recorded in CNDDB (River Partners 2010, entire; Arnold and Woollett 2004, p. 8; Arnold 2014a, pers. comm.).

We did not use the locations presented in Halstead and Oldham (2000, p. 75) to develop this presumed historical range since their publication did not distinguish between the two subspecies.

The presumed historical range of the valley elderberry longhorn beetle represents a patchy distribution from Tehama County to Fresno County, as shown in Figure 1 below (Service 2014, GIS analysis). Observations of adult beetles have been reported from Shasta County in 2008 and 2009 (CNDDB EO 218), as well as exit holes in 1991 and 2007 through 2012 (CNDDB EO 218; Holyoak and Graves 2010, p. 23), and an unconfirmed adult male valley elderberry longhorn beetle in 2013 (Souza 2014, pers. comm.). We did not include Shasta County within our presumed historical range because of the difficulty in distinguishing female valley elderberry longhorn beetle from female California elderberry longhorn beetle, the unconfirmed observation of an adult male valley elderberry longhorn beetle, and the absence of museum specimens from this area. However, we acknowledge that the recent observations of exit holes in portions of Shasta County (along the Sacramento River) may represent an expansion of the historic range of the valley elderberry longhorn beetle to this location. With regard to recorded CNDDB observations of valley elderberry longhorn beetle in Tulare County, it is important to note that there is significant uncertainty as to whether the male and female adult beetles observed in that area represent observations of the valley elderberry longhorn beetle or the California elderberry longhorn beetle (CNDDB EOs 63, 66, 128, 154). Based on the distribution map prepared by Chemsak (2005, pp. 6–7) and the discussion (and map)

presented in Talley *et al*. (2006a, pp. 5–6), it is reasonable to conclude that the Tulare County observations likely represent the California elderberry longhorn beetle.

Figure 1. Presumed historical range of the valley elderberry longhorn beetle, California. Sources: Halstead and Oldham 1990, Chemsak 2005, Talley *et al*. 2006a, River Partners 2010, CNDDB 2013, Arnold 2014a.

Current Distribution (since 1997)

The most recent, comprehensive rangewide survey by observers known to be qualified to detect occupancy of the valley elderberry longhorn beetle was conducted in 1997 (see Collinge *et al*. 2001, entire). Collinge *et al*. (2001, entire) resampled 65 of 79 sites surveyed by Barr in 1991 and 7 additional sites within the Central Valley in 1997.

Within the last 10 years, surveys in the Central Valley for the valley elderberry longhorn beetle have included the following:

(1) Examining 4,536 elderberry shrubs in the Lower American River (14.9 mi) (24 km) and Putah Creek (28 km (17.4 mi)) (Talley 2005, entire).

(2) Conducting exit hole surveys in 2010 of both elderberry shrubs (441) and stems (4,247) in 10 watersheds from Shasta to Tulare Counties (34 sites) (Holyoak and Graves 2010, entire).

(3) Conducting surveys of potential and occupied valley elderberry longhorn beetle habitat within riparian areas along the Stanislaus River (59 mi (95 km)) and San Joaquin River (12 mi (19.3 km)) in 2006 (River Partners 2007, entire).

It should be noted that some of the surveys described above were conducted within areas located adjacent to public roads or within accessible areas such as public parks (i.e., "convenience" sampling) in order to more easily access and examine shrubs for exit holes, or to better observe adults. Therefore, survey results should not be considered as a complete representation of the entire population distribution (or occupancy) of the valley elderberry longhorn beetle at the time of the particular survey.

In this withdrawal, we provide a reevaluation of the valley elderberry longhorn beetle occurrence records described in our proposed rule, and we also incorporate new information received since the proposed delisting rule was published on October 2, 2012 (77 FR 60238). This reanalysis now provides the most accurate assessment of the presumed extant occurrences of the valley elderberry longhorn beetle (based on the best available commercial and scientific information) as compared to what was presented in the proposed rule. Specifically, we started with identifying CNDDB EOs (adults or exit holes, any age) observed since 1997 (past 16 years), as this was the year in which the most recent, comprehensive rangewide survey by observers known to be qualified to detect occupancy of the species was conducted (Collinge *et al.* 2001). Next, a subset of these CNDDB EO records were used if they had an Occurrence Rank of "fair" (occurrence characteristics are non-optimal, and occurrence persistence is uncertain in current conditions), "good" (occurrence has favorable characteristics and is likely to persist for the foreseeable future (20–30 years), if current conditions prevail) or "excellent" (occurrence has optimal or exceptionally favorable characteristics and is very likely to persist in foreseeable future (20–30 years), if current conditions prevail) (NatureServe 2014).

In addition, we incorporated into our reanalysis records from:

(1) Observations of exit holes (recent holes only based on level of detail available) from surveys conducted in 1997 (Collinge *et al*. 2001, entire; Collinge 2014 pers. comm.).

(2) Exit hole (any age) and adult beetle locations in four watersheds (Lower American River, Putah Creek, Cache Creek, Cosumnes River) from 2002–2005 surveys (Talley 2014a, pers. comm.).

(3) Exit hole (any age) locations from 10 watersheds as described in Holyoak and Graves (2010, entire).

(4) Exit hole (any age) locations along the Stanislaus and San Joaquin Rivers from River Partners (2007, entire).

(5) Adult beetle observations along the Feather and Sacramento Rivers from River Partners (2010 and 2011; entire).

(6) Exit hole (any age based on detailed information available from recent data sets) locations recorded at Beale Air Force Base (Department of Defense (DOD 2014, unpublished GIS data)).

Of the currently described 201 CNNDB records (CNDDB 2013, entire) for the valley elderberry longhorn beetle, 142 EOs represent observations of only exit holes, 52 EOs represent observations from 1997 to 2013, and 25 EOs represent observations from 1997 to 2013 with an Occurrence Rank of "fair," "good," or "excellent."

We then selected the locations of observations (exit holes or adults) found within our defined presumed historical range (as shown in Figure 1) for the valley elderberry longhorn beetle. These locations (which represent 17 EOs) are summarized in Table 1 by their geographical location (e.g., hydrological feature) and illustrated in Figure 2. Of note, we could not locate (using GIS software (Service 2014, GIS analysis) with an

acceptable level of accuracy the six mitigation site survey locations (2005 and 2006) from Holyoak and Koch-Munz (2008, Appendix A1); thus, these six locations were not included in Table 1 or Figure 2. However, many, if not all, of these six mitigation site locations are within watersheds where occupancy (exit holes) of the valley elderberry longhorn beetle has been observed within the last 16 years, or are locations that were reported in the CNDDB EO report (CNDDB 2013, entire).

Table 1. Geographical locations of valley elderberry longhorn beetle occurrences since 1997 in California, grouped by hydrologic unit. Based on observations (adults or exit holes), including CNDDB EOs with an occurrence rank of "fair, good, or excellent," and other survey results within the valley elderberry longhorn beetle's presumed historical range (see Figure 1). Sources: Collinge *et al*. 2001; Holyoak and Graves 2010; River Partners 2007, 2010, 2011; CNDDB 2013; Collinge 2014, pers. comm.; Talley 2014a, pers. comm.; DOD 2014.

Hydrologic Unit *Geographical Location*	**Type of Observation (Adult[1], Exit Holes)**	**Year Last Observed**
Thomes Creek–Sacramento River		
Millrace Creek	Adult (unknown), Exit Holes	2001
Salt Creek	Adult (both), Exit Holes	2001
Sacramento River (SSE of Red Bluff)	Adult (both), Exit Holes	2001
Big Chico Creek–Sacramento River		
Sacramento River (E of Corning)	Exit Holes	2010
Sacramento River (Glenn–Colusa Irrigation District Mitigation Site)	Adult (male)	2002
Sacramento River Mitigation Area (aggregation of shrubs, many exit holes[2])	Exit Holes	2003
Big Chico Creek (two locations)	Exit Holes	1997
Sacramento–Stone Corral		
Sacramento River (N of Colusa)	Exit Holes	2010
Honcut Headwaters–Lower Feather		
Feather River (SW of Oroville) (three locations)	Exit Holes	2010
Feather River (Feather River Elderberry Transplant Area)	Adult (both)	2010
Feather River (5 mi N of Marysville)	Exit Holes	1997
Feather River (Star Bend Elderberry Mitigation Site) (two locations)	Adult (both)	2010
Feather River (10 mi SW of Wheatland)	Exit Holes	2010

(two locations)		
Reeds Creek (Beale AFB)	Exit Holes	2012
Upper Bear		
Bear River (SSE of Wheatland)	Adult (unknown), Exit Holes	2003
Bear River (4 mi SW of Wheatland) (three locations)	Exit Holes	2010
Best Slough/Dry Creek (Beale AFB)	Exit Holes	2005
North Fork American		
Folsom Lake (NW Shore)	Exit Holes	1997
Folsom Lake	Exit Holes	2010
Lower American		
Miners Ravine (tributary of Dry Creek)	Exit Holes	1997
American River Parkway (aggregation of shrubs, many exit holes)	Adult (female), Exit Holes	2010
Upper Cache		
Cache Creek (many locations)	Exit Holes	2003
Lower Sacramento		
Willow Slough (SW of Esparto)	Adult (male), Exit Holes	2001
RD-900 Canal (W of Sacramento River)	Adult (both)	2006
Sacramento River (SW of Sacramento)	Adult (male)	2005
Upper Putah		
Putah Creek (aggregation of shrubs, many exit holes)	Adult (unknown), Exit Holes	2010
Upper Cosumnes		
Cosumnes River (24 locations)	Exit Holes	2003
Upper Mokelumne		
South of Mokelumne River	Exit Holes	2006
Upper Calaveras		
Calaveras River	Exit Holes	2000
Upper Stanislaus		
Stanislaus River (N of Modesto) (two locations, several areas)	Exit Holes	2010
Bear Creek (tributary of Stanislaus River)	Adult (female)	2002
South of Mountain Pass Creek (S of Yosemite Jct.; tributary of Stanislaus River)	Adult (female)	2007
Upper Tuolumne		
Tuolumne River	Exit Holes	1999
Algerine Creek (tributary of Tuolumne River)	Exit Holes	2007
Upper Merced		
Merced River (S of Modesto)	Exit Holes	2010
Tulare Lake Bed		
Kings River (E of Centerville)	Adult (both), Exit Holes	1998

[1]Some adult valley elderberry longhorn beetle observations were not identified as either male or female, and some observations were identified to include both males and females.
[2]The term "many" in this table is defined as a value greater than 50.

Figure 2. Presumed extant occurrences of the valley elderberry longhorn beetle, California. Based on observations (adult beetles and exit holes) since 1997 within its presumed historical range; CNDDB occurrence rank of "fair, good, or excellent." Sources: Collinge *et al*. 2001; River Partners 2007, 2010, 2011; Holyoak and Graves 2010; CNDDB 2013; Collinge 2014, pers. comm.; Talley, 2014, pers. comm.; DOD 2014.

Table 1 represents a reevaluation of the 26 "locations" listed in the proposed rule (77 FR 60242–60243 (Table 1); October 2, 2012) based on our assessment of observations since 1997, while incorporating our current description of the presumed historical range of the valley elderberry longhorn beetle (see *Presumed Historical Range* section above). This revision of presumed extant occurrences (as compared to Table 1 in the proposed delisting rule) is based on: (1) A review of the quality of the CNDDB EOs (type of observation, the year of last observation, and occurrence rank); (2) additional data sets (as discussed above and represented in Figure 2); (3) comments received from the peer reviewers, Federal, County, and local agencies, the public, and other interested parties relative to occupancy; and (4) a new grouping of geographical locations based on hydrologic units defined by a national watershed boundary dataset (USGS 2013b). Since some observations did not distinguish between old and recent exit holes, we include observations of both old (greater than 1 year old) and recent (i.e., greater than or equal to 1 year) exit holes for most survey results.

Taken together, these data (presented in Table 1 and Figure 2) describe an uncommon or rare, but locally clustered, occupancy of the valley elderberry longhorn beetle within the presumed historical range over the past 16 years within approximately 18 hydrologic units (USGS 2013b) and 36 geographical locations within the Central Valley. The 36 geographical locations are considered to be discrete from each other based on a presumed maximum dispersal distance of approximately 1 mi (1.6 km) based on observations of male beetles from Arnold (2014a, pers. comm.), but in some areas (e.g., Putah Creek) they include several areas of elderberry habitat within that location.

As shown in Table 1, 61 percent (22 of 36) of the geographical locations are areas where only exit holes have been used to define occupancy, which is the result of both the survey methods used and the difficulty in observing adult valley elderberry longhorn beetles. Twenty-five percent (9 of 36) of the geographical locations within 4 hydrologic units represent observations of adult males recorded since 1997.

Restoration and Mitigation Sites

A large amount of monetary resources has been invested in floodplain restoration along sections of the Sacramento River for the purpose of restoring riparian areas that serve as habitats for native plants and wildlife, including the valley elderberry longhorn beetle (Golet *et al*. 2008, p. 2; Golet *et al*. 2013, entire). Holyoak *et al*. (2010, p. 50) estimated that an average of 2.5 mitigation sites were initiated per year, with more than 1,000 elderberry and 6,000 native plants planted per year for the 1989–1999 time period. Our proposed rule described a number of conservation easements or banks, mitigation and restoration sites, and other conserved areas that have been established within the current range of the valley elderberry longhorn beetle, which we estimated to be approximately 21,536 ac (8,715 ha) (77 FR 60256–60258; October 2, 2012).

Mitigation for the valley elderberry longhorn beetle generally consists of planting elderberry seedlings and associated native plants and transplanting mature elderberry shrubs from impacted sites to mitigation sites (Holyoak *et al*. 2010, pp. 44, 46). In our proposed rule, we provided an estimate (642 to 1,900 ac (260 to 769 ha)) of valley

elderberry longhorn beetle habitat protected through measures associated with section 7 consultations or through conservation or mitigation measures established through Habitat Conservation Plans permitted under section 10 of the Act (see *Factor D* discussion below) (77 FR 60258; October 2, 2012). We also identified another large riparian area (4,600 ac (1,862 ha)) along the American River (the American River Parkway) that contains critical habitat for the valley elderberry longhorn beetle, but the amount of occupied elderberry habitat is not known (77 FR 60258; October 2, 2012). However, we indicated in the proposed rule that an unknown proportion within these areas (i.e., conservation easements, mitigation sites, restoration sites, etc.) actually contain elderberry shrubs and only a proportion of that (unknown) estimate contains habitat occupied by the valley elderberry longhorn beetle.

By mid-2013, approximately 2,698 elderberry shrubs (covering 1,000 ac (405 ha)) were expected to be planted by Pacific Gas and Electric Company (PG&E) in conservation areas located near or adjacent to existing elderberry populations in the Central Valley (Ross-Leech 2012, pers. comm.). Valley elderberry longhorn beetle exit holes have been recorded at five locations where PG&E is conducting biannual monitoring (Ross-Leech 2012, pers. comm.). PG&E has established mitigation sites in several counties to compensate for project-specific effects to the valley elderberry longhorn beetle. Fifteen sites are located in Tehama and Yolo Counties, with approximately 1,228 elderberries successfully established (as of 2002), and occupancy of the valley elderberry longhorn beetle (adults or exit holes) has been observed at 11 of the 15 sites (Ross-Leech 2012, pers. comm.).

The Center for Natural Lands Management (CNLM) manages four preserves in the Central Valley where naturally occurring or planted elderberry are found; CNLM owns three and holds a conservation easement on the other (Rogers 2012, pers. comm.). Management practices being implemented at these sites appear to be consistent with maintaining elderberry habitat; however, the protection and stabilization of the valley elderberry longhorn beetle is not the primary management objective for the preserves, and funding is limited for management activities to specifically support valley elderberry longhorn beetle conservation (Rogers 2012, pers. comm.) Two of these preserves (Pace and Keeney in San Joaquin and Butte Counties, respectively) have recorded valley elderberry longhorn beetle exit holes within the past 3 to 10 years; however, no monitoring for the species has been conducted within the other two preserves (Oxbow in San Joaquin County and Dublin Ranch in Alameda County) or within the Mehrton conservation bank (Sacramento County) that CNLM neither owns nor manages (Rogers 2012, pers. comm.). We describe restoration efforts of elderberry habitat located within National Wildlife Refuges in the Central Valley below, under *Factor D*, Other Conservation Programs.

Transplanted elderberry shrubs appear to be important in the colonization of mitigation sites by the valley elderberry longhorn beetle. For those sites where there was no potential introduction of the species via transplanted shrubs, one study found a 13.4 percent colonization rate for transplanted areas as compared to 2.3 percent for seedlings (Holyoak *et al*. 2010, p. 49). As noted in this study, it can take approximately 7 years for

elderberry shrubs to grow large enough to support the life-history requirements of the valley elderberry longhorn beetle, but monitoring is generally required only for 10–15 years (Holyoak *et al*. 2010, p. 51). Thus, the observed low colonization rates are not unexpected, and the authors suggest that prescribed monitoring periods may not be of long enough duration for the species to find and use its host plant (Holyoak *et al*. 2010, p. 51). The study found that the occupancy for the valley elderberry longhorn beetle was 43 percent for all sites through either introduction associated with transplanted elderberry shrubs or through colonization (Holyoak *et al*. 2010, pp. 49–50). Overall, the conclusions from this study suggest that transplantation of elderberry is important for the species because the transplanted shrubs can contain the larval stage of the valley elderberry longhorn beetle or the shrubs are large enough for the species to be able to recolonize areas within its range.

Small mitigation sites may not be of sufficient size to support recolonization of the valley elderberry longhorn beetle. The mitigation study conducted by Holyoak and Koch-Munz (2008, entire) highlighted the size differential between mitigation sites established for the valley elderberry longhorn beetle (mean 1.83 ac (1.74 ha) versus natural areas (mean 7.5 ac (3 ha)), and the authors concluded that the smaller sites established for mitigation are contributing to the habitat fragmentation for this species (Holyoak and Koch-Munz 2008, p. 452). The mitigation review by Holyoak *et al*. (2010, p. 51) also emphasized the importance of using transplants in reproducing populations of the valley elderberry longhorn beetle, and they recommended shrubs be transplanted to older mitigation sites that already contain elderberry plants of sufficient size such that the

valley elderberry longhorn beetle species does not have to rely solely on transplanted shrubs for its survival. Holyoak *et al*. (2010, p. 49) reported that the valley elderberry longhorn beetle most frequently entered mitigation sites within elderberry shrubs that were transplanted from the site that was impacted. Their study found that the valley elderberry longhorn beetle was found at 28 percent of all mitigation sites, but at 88 percent of mitigation sites to which elderberry shrubs potentially containing valley elderberry longhorn beetles were transplanted; thus, only 16 percent of sites were colonized by the valley elderberry longhorn beetle on their own (Holyoak *et al*. 2010, p. 51). In addition, Holyoak *et al*. (2010, p. 51) suggested using transplanted elderberry shrubs within (not between) watersheds to avoid disruption of potential genetic population structures. However, we are unaware of studies that have investigated valley elderberry longhorn beetle genetics between populations.

Perhaps more importantly, in addition to incorporating appropriate measures of size and appropriate elderberry characteristics in achieving successful occupancy of the valley elderberry longhorn beetle at restoration and mitigation sites, restoring natural riverine processes is also necessary to achieve functional restoration of remnant riparian ecosystems (e.g., Golet *et al*. 2013, entire). Restoring riverine processes typically requires maintaining a hydrologic connection of floodplain areas with river systems and managing a flow regime for both ecological and human needs (Golet *et al*. 2008, p. 20). The continued planting of seedlings or transplantation of shrubs at unsuitable mitigation or restoration sites is not only costly in resources, but represents a strategy that will likely

not successfully achieve an elderberry shrub age class that provides a viable conservation value for the valley elderberry longhorn beetle and other wildlife.

Population Structure

The concepts of metapopulations, metapopulation theory, and the modeling of metapopulations have become increasingly useful tools for applying principles of landscape ecology to biological conservation. Metapopulations are defined as a system of discrete subpopulations that may exchange individuals through dispersal, migration, or human-mediated movement (Breininger *et al*. 2002, p. 405; Nagelkerke *et al*. 2002, p. 330). Metapopulation models can provide a way to analyze and predict the response of individual species to habitat fragmentation and other landscape elements (Beissinger *et al*. 2006, p. 15).

The effects of spatial diversity (heterogeneity) on the distribution of the valley elderberry longhorn beetle were assessed using survey data collected at Central Valley study sites over 2 years (2002–2004) by Talley (2007, entire) that integrated patch (fine scale), gradient (broad scale), and hierarchical (mosaic of discrete multi-scale patches) spatial frameworks. The analysis revealed that a hierarchical spatial framework explained the most variance in the occupancy of the valley elderberry longhorn beetle (for the three river systems in which a spatial framework for the species was identified) (Talley 2007, p. 1484). However, an integrative approach of all three spatial frameworks (patch, gradient, and hierarchical) best defined a population structure for the valley

elderberry longhorn beetle (Talley 2007, p. 1486). This population structure can be characterized as patchy-dynamic, with regional distributions made up of local aggregations of populations (Talley 2007, p. 1486). These localized populations are defined by both broad-scale or continuous factors associated with elderberry shrubs (e.g., shrub age or densities) and environmental variables associated with riparian ecosystems (e.g., elevation, associated trees) that themselves have patch, gradient, and hierarchical structures (Talley 2007, p. 1486).

Based on surveys conducted from 2002–2004, Talley (2005, pp. 25–26) concluded that the valley elderberry longhorn beetle vulnerable developmental stages (i.e., exposure of eggs and larvae) and its rarity (i.e., low local numbers, low occupancy) are important elements of the observed metapopulation structure of the species. Talley (2005, pp. 25–26) further concluded that large-scale catastrophic events and local changes in random processes or events (i.e., environmental stochasticity) have the potential to negatively affect riparian systems and, therefore, the species' vulnerability. Results from several other surveys of exit holes support the rarity traits such as low local numbers and low site-occupancy exhibited by the valley elderberry longhorn beetle:

(1) Estimates of occupancy, as measured by recent (new) exit hole observations *per elderberry groups* (or site), in the Central Valley were reported by Collinge *et al*. (2001, p. 105), based on surveys conducted in 1991 and 1997 (see Barr 1991, entire; Collinge *et al*. 2001, entire). From these two surveys, Collinge *et al*. (2001, p. 105) estimated an occupancy rate of approximately 20 percent for both 1991 and 1997.

(2) A 2003 survey of planted elderberry shrubs (planted from 1993 to 2001) within restoration sites on the Sacramento River NWR found 0.6 to 7.9 percent shrubs contained exit holes (average per refuge unit) (River Partners 2004, pp. 2–3).

(3) A 2007–2008 survey of restoration sites within eight units of the Sacramento River NWR reported 21 percent occupancy based on observations of new exit holes (Gilbart 2009, p. 40).

(4) A 2010 survey of valley elderberry longhorn beetle exit holes within both elderberry shrubs and stems at 34 sites in 10 watersheds (American River to Tule River) determined the following occupancy (abundance) estimate information (Holyoak and Graves, 2010, entire; Holyoak and Graves 2010, Appendix 1):

- Forty-seven percent, or 16 of 34 sites, had new exit holes in elderberry shrubs.
- Ninety percent of the watersheds surveyed had new exit holes (elderberry stem or shrub).
- Sixteen percent, or a total of 71 new holes, were found out of a total of 441 elderberry shrubs surveyed (all sites).

(5) A June 2002 to September 2004 survey of a 14.9-mi (24-km) riparian corridor along the American River (lower American River Basin) estimated occupancy rates of the valley elderberry longhorn beetle ranging from 11.2 percent in lower alluvial plain, to 10.5 percent in mid-elevation riparian, to 8.7 percent in upper riparian terrace, to 2.9 percent in non-riparian scrub habitat (Talley *et al*. 2007, pp. 25–26).

Although the surveys outlined above are not identical in their survey sites and sampling methods, the 16 percent abundance estimate from 2010 (new exit holes for all sites surveyed) and the 21 percent occupancy estimate from 2007 to 2008 (new exit holes from restoration sites at the Sacramento River NWR) (Gilbart 2009, p. 40) align closely with the 20 percent occupancy estimates for 1991 and 1997 presented in Collinge *et al*. (2001, p. 105).

Based on a spatial analysis of valley elderberry longhorn beetle populations in the Central Valley, Talley (2007, p. 1487) concluded that the several hundred meter (hundreds of feet) distances observed between local aggregations of the species supports a limited migration distance for this species, as noted above (see *Adult Behavior and Ecology* section). Talley (2007, p. 1487) further concluded that the clustering of valley elderberry longhorn beetle populations at smaller scales, tens of meters (tens of yards), is likely due to aggregation behaviors of this species, and is not the result of: (1) Environmental variables that occur at larger scales (less than 328 ft (less than 100 m), such as detection of elderberry plants (via plant volatiles); or (2) distances relevant to mate attraction, which occur at even smaller scales (few inches (centimeters)). However, additional studies of movement patterns are needed in order to better describe these observations of clustering and how these patterns relate to habitat availability (see *Adult Behavior and Ecology* section above).

Further support for the clustering or aggregations pattern of valley elderberry longhorn beetle populations can be found in colonization and extinction rates developed

by Collinge *et al*. (2001, pp. 107–109) and Zisook (2007, p. 5). Collinge *et al*. (2001, p. 107) found in a comparison of 1991 and 1997 surveys of both old and recent exit holes in 14 drainages (65 sites, 111 groups of elderberry shrubs), that two sites (6.5 percent) had *long-term* extinctions (i.e., no holes found in 1997 and exit holes of any age observed in 1991) and four sites (12.9 percent) had *long-term* colonizations (i.e., recent exit holes observed in 1997, but no exit holes of any age found in 1991). The comparative study also described short-term events (extinctions and colonizations) based only on observations of recent exit holes for both survey years. Nine sites (29 percent) exhibited *short-term* extinctions and six sites (19.4 percent) had *short-term* colonizations (Collinge *et al*. 2001, p. 108). One area (near Black Butte Lake; Stony Creek drainage) that was occupied in 1991 was found to be unoccupied in the 1997 survey (Collinge *et al*. 2001, p. 108). The study concluded, based on observations of only recent exit holes, that 77 percent of the sites had the same occupancy status for the 2 years, with 23 percent of sites showing some turnover between the two surveys (Collinge *et al*. 2001, p. 108). Zisook (2007, entire) presented an unpublished analysis of extinction and colonization rates for the valley elderberry longhorn beetle based on elderberry shrub sampling along a 14.9-mi (24-km) section of the Lower American River. The analysis compares the 2000 to 2004 surveys to re-sampling efforts in 2005. In this study, extinction was defined when no new (recent) holes were found on the same shrub in 2005 but where any age holes were recorded in 2000–2004; a colonization event was recorded when there were no new holes found on a shrub in 2000–2004, but a recent hole was found on the same shrub in 2005 (Zisook 2007, p. 4). The analysis estimated an extinction rate of about 57 percent and a colonization rate of 19.1 percent for the population sampled (Zisook 2007, p. 3).

These evaluations suggest that occupied sites of the valley elderberry longhorn beetle tend to remain occupied (i.e., 77 percent), but also exhibit variable long-term extinction rates (between 6.5 to 57 percent), and slightly higher short-term extinction rates. These occupancy patterns result in a local clustering or aggregations of regional, but patchy, populations within its range. We caution that these extinction evaluations/results are from short-term studies at different locations; therefore, these rates may not be suitable to illustrate past or current conditions, especially for areas that have not been recently surveyed for occupancy or colonization.

Rangewide surveys that utilize recent (new) exit holes as a measure of valley elderberry longhorn beetle occupancy continue to be challenging, given the species' low population densities and wide, but discontinuous distribution. Monitoring methods for valley elderberry longhorn beetle sites were evaluated from surveys conducted in 2010 at 10 watersheds (34 sites), from Shasta County to Kern County (Holyoak and Graves 2010, entire). The study determined that an occupancy rate of 1.5 percent of elderberry stems and a sample size of at least 600 elderberry stems for each watershed was needed to detect large (50 to 80 percent) declines in populations of the valley elderberry longhorn beetle, a condition not met in many areas of the Central Valley (Holyoak and Graves 2010, p. 2). However, using a sampling rate of 500 elderberry stems and 50 elderberry shrubs per watershed, the study found that a good estimate of population density (based on the number of new exit holes present) could be determined for 4 of the 10 watersheds surveyed (or 23 of 34 sites) (Holyoak and Graves 2010, p. 2). The authors recommended

that a monitoring program for the valley elderberry longhorn beetle in the Central Valley include a core group of sites with the necessary number of elderberry stems to determine occupancy, in combination with sampling other watershed locations for presence or absence of new exit holes rather than abundance (Holyoak and Graves 2010, p. 20).

Pheromone traps using aggregation pheromones (male-produced sex attractants) (see, for example, Lacey *et al*. 2004, entire) may provide an important survey tool for future distribution or taxonomic studies. In April 2013, after the proposed rule published, field trials were conducted at a riparian forest restoration site within the Sacramento River NWR to test the efficacy of synthesized female valley elderberry longhorn beetle sex pheromone (Arnold 2013, entire). Male valley elderberry longhorn beetles were attracted almost exclusively to traps baited with the (*R*)-desmolactone sex pheromone (33 of 34 males captured); no female adult beetles were found in the traps (Arnold 2013, p. 4). This pheromone has also been found (under laboratory conditions and in the field) to be an attractant for male California elderberry longhorn beetles in San Bernardino County (Ray *et al*. 2012, pp. 163–164). In both studies, no other cerambycid species were caught in traps baited with either (*R*)-or (*S*)-desmolactone, which suggests that (*R*)-desmolactone may be a pheromone specific to only these two subspecies (Ray *et al*. 2012, p. 166; Arnold 2013, p. 4). Observations of male beetles (confirmed through their sexually dimorphic characteristics) attracted to these traps could also be used to confirm the taxonomic identity of the valley elderberry longhorn beetle where the two subspecies may co-occur (Arnold 2013, p. 4).

Vulnerability Factors

Collinge *et al*. (2001, p. 111) described the observed distribution and abundance pattern of the valley elderberry longhorn beetle as an unusual type of rarity, with small and localized populations where it occurs within its presumed historical range. Rare species are generally considered more vulnerable to extinction than common species (Sodhi *et al*. 2009, p. 517). In general, three criteria of rarity can be used to evaluate a species' vulnerability to extinction risk when applied to its entire geographic range or to its distribution and abundance in a specific area: (1) Narrow geographic range; (2) specific habitat requirements; and (3) small population size, although within a limited geographical range, a rare species may be locally abundant (Primack 2006, pp. 155–156).

There is not always a consistent relationship between rarity and extinction risk resulting from human influences, since the risk of extinction is a function of more complex interrelationships between the ecology of a species, its life history, and human activities (Pullin 2002, pp. 199–200). Nevertheless, vulnerability measures (e.g., Kattan index (Kattan 1992, entire)) have been shown to be good proxies for extinction risk, as observed for a study of beetles in an Italian region of the Mediterranean (Fattorini 2013, p. 174).

The valley elderberry longhorn beetle exhibits several life-history traits that may limit its distribution and population growth, which can provide an extinction vulnerability profile. These attributes include:

(1) Restriction of the species to specific host plant taxa within the Central Valley of California (i.e., specialized niche).

(2) Dependence on riparian ecosystems that have been reduced in size and modified by human activities.

(3) Locally clustered populations with limited dispersal ability that can be affected by natural and human disturbances.

All of these attributes, but particularly habitat specificity, represent vulnerabilities for the valley elderberry longhorn beetle. Vulnerability to extinction can be further complicated by the effects of a changing climate. Numerous traits associated with climate change vulnerability have been identified and consolidated into trait sets by Foden *et al*. (2013, entire), based on a global assessment of bird, amphibian, and coral species. Although the trait sets were not specific to insect taxa, they are similar to variables considered in climate change vulnerability assessment indices for vertebrate species (Bagne *et al*. 2011, entire) and for plant and animal species (Glick *et al*. 2011, pp. 40–43, 48–50; Young *et al*. 2011, entire). The trait sets are as follows: specialized habitat and/or microhabitat specialization; narrow environmental tolerances; potential for disruption of environmental triggers if they are important aspects in the life cycle; disruption of important interspecific interactions; rarity; poor dispersal potential due to low inherent dispersal ability and/or extrinsic barriers to dispersal; and poor micro-evolutionary potential due to low genetic diversity, long generation lengths and/or low reproductive output (Foden *et al*. 2013, e65427). In addition to the effect of any one trait,

interactions between life history and spatial traits also can influence extinction risk due to climate change (Pearson *et al*. 2014, entire; Guisan 2014, entire).

Vulnerabilities may separately, or together, exacerbate the risk of the threats described below in the **Summary of Factors Affecting the Species** section.

Population Viability Analysis

Greenberg (2009, entire) developed a population viability analysis (PVA) for the valley elderberry longhorn beetle using, in part, demographic information provided from personal communications from previous researchers. A metapopulation model was constructed to examine how the spatial arrangement of habitat, dispersal range of adults, and regulation of local populations (density dependence) based on age structure affect the persistence of the valley elderberry longhorn beetle. The results of this PVA model provide useful insights into how the number and configuration of patches affect population persistence and highlight the need to better understand migration distance between patches (Greenberg 2009, p. 55). However, the predictions of population persistence probabilities for this limited PVA analysis should be used with caution given the incomplete empirical information and choice of parameter values used in constructing this particular model. In addition, this model did not incorporate potential effects related to climate change. Thus, in this withdrawal, we do not provide additional discussion of this PVA (and note this analysis has not been peer reviewed); however, we anticipate using this modeling tool to help direct future management options.

Summary

When we consider the low estimates of occupancy (Talley *et al*. 2007, pp. 25–26) and observed extinction and colonization patterns (Collinge *et al*., 2001, pp. 107–108; Zisook 2007, p. 5), combined with our re-evaluation of available data sets describing the distribution of observations over the past 16 years (since 1997) (see Table 1, Figure 2), it is apparent that the distribution and abundance of the valley elderberry longhorn beetle is clustered in regional aggregations and locally uncommon or rare, which is consistent with our understanding of its rare, patchy distribution pattern across its presumed historical range in the Central Valley. Although evidence of occupancy (primarily observations of exit holes) for the species has been documented in additional locations to those recorded at the time of listing in 1980, the best available data indicate this is a result of limited data available at the time of listing and the subsequent surveys conducted in: (1) The late 1980s (Jones and Stokes 1987, entire); (2) 1991 (Barr 1991, entire); (3) 1997 (Collinge *et al*. 2001, entire); (4) 2002–2005 (Talley 2014a, pers. comm.); and (5) 2010 (Holyoak and Graves 2010, entire). These surveys have better defined the presumed historical range of both elderberry longhorn beetles found in California (see also Chemsak 2005, pp. 6–7; Figure 1, above). Additional comprehensive surveys within the Central Valley, particularly locations of adult male beetles, and the development of long-term population data sets for this species are needed in order to provide a more complete assessment of current population size and distribution.

As noted above, the valley elderberry longhorn beetle exhibits several attributes that may limit its distribution and population size. These include small numbers in localized populations, low estimates of occupancy within its range (see *Population Structure* discussion), limited dispersal, and dependence on two host plants for its entire life cycle that are currently found within ecological communities that have been reduced, fragmented, or otherwise degraded through human-caused alterations. These attributes, particularly habitat specificity (i.e., increased specialization), represent important vulnerabilities for the valley elderberry longhorn beetle, that separately, or together, may exacerbate any of the threats described below in our five-factor analysis. Furthermore, environmental factors (e.g., additional habitat loss, unfavorable hydrological conditions) or other types of stressors (e.g., predation) are likely to significantly influence the species' vulnerability to extinction (see **Summary of Factors Affecting the Species** discussions below).

Summary of Factors Affecting the Species

Section 4 of the Act and its implementing regulations (50 CFR 424) set forth the procedures for adding species to the Federal Lists of Endangered and Threatened Wildlife and Plants. A species may be determined to be an endangered species or threatened species because of one or more of the five factors described in section 4(a)(1) of the Act: (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. Listing actions may be warranted based on any of the above threat factors, singly or in combination. Each of these factors is discussed below.

The five factors listed under section 4(a)(1) of the Act and their analysis in relation to the valley elderberry longhorn beetle are presented below. This analysis of threats requires an evaluation of both the threats currently facing the species and the threats that could potentially affect it in the foreseeable future. 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.

The information presented in the five-factor analysis in this withdrawal differs from that presented in the proposed rule. Specifically, we restructured the five-factor analysis from our proposed rule (77 FR 60238; October 2, 2012) to reflect our reanalysis of threats, including additional and more detailed information (e.g., invasive plants in *Factor A* and pesticides under *Factor E*). We provide a more extensive discussion of effects related to climate change in our analysis of threats (under *Factors A* and *E*), including incorporation of predictions from several regional climate models for the Central Valley region. We also incorporate detailed results of several studies (e.g., metapopulation analysis) and use this information to evaluate the current threats to the species. We also reiterate our discussion contained in the proposed rule of small population size under *Factor E*, but do not include in this withdrawal an evaluation of loss of populations resulting from habitat fragmentation because we find that additional data are needed to adequately or appropriately assess this threat. Threats related to the effects of pruning, briefly mentioned in our proposed rule under a *Factor E* threat (Human Use) (77 FR 60263; October 2, 2012), are discussed in this withdrawal under *Factor A*.

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

Historical Loss of Riparian Ecosystems

In our final rule listing the valley elderberry longhorn beetle as threatened and designating critical habitat (45 FR 52803; August 8, 1980), we identified loss of habitat as a significant impact to the valley elderberry longhorn beetle due to the threats of agriculture conversion, levee construction, and stream channelization within its "former" range. In our proposed rule to delist the valley elderberry longhorn beetle (77 FR 60250; October 2, 2012), we reviewed the impacts, or potential impacts, of agricultural and urban development to the species, primarily in the context of the loss of riparian vegetation in the Central Valley, as well as impacts, or potential impacts, related to the effects of levee construction and other flood protection measures, and road maintenance and dust. In this withdrawal, we provide a revised description of the impact of habitat loss to the valley elderberry longhorn beetle based on our analysis of recently mapped elderberry habitat within the Central Valley (Service 2014, GIS analysis), in conjunction with new discussion related to the success of restoration and mitigation sites intended to provide habitat for the species. Similar to the proposed rule (77 FR 60250–60258; October 2, 2012), we also include separate discussions for *Factor A* threats that may result in the destruction or modification of habitat (i.e., levee and flood protection infrastructure, road and trail use and maintenance, pruning, effects of climate change, and invasive plants). Additionally, we note that pruning was only briefly discussed in the proposed rule under *Factor E*—Human Use; we have expanded that discussion and are

now including it under *Factor A* because we consider pruning activities to be a potential threat related to destruction or modification of habitat.

Loss of habitat is the leading cause of species extinction (Pimm and Raven 2000, p. 843). Insects that are considered specialized plant-feeders or those restricted to one (monophagous) or a few (oligophagous) plant taxa are especially vulnerable to habitat loss, as their survival may depend on their ability to make improbable or impossible host plant shifts (Fonseca 2009, p. 1508). The valley elderberry longhorn beetle can be considered an oligophage, and is dependent exclusively on two elderberry taxa (see Habitat section) for all aspects of its life history.

Prior to settlement by Anglo-Americans, the Central Valley contained extensive riparian plant communities along unaltered river systems, including riparian forests comprised primarily of sycamore, cottonwood, willow, and oak trees and a thick understory of shrubs, including elderberry (Roberts *et al*. 1980, pp. 7, 10). A detailed summary of historical observations (circa 1800s) of riparian forests along the Sacramento River is presented in Thompson (1961, pp. 301–307). The majority of this "timber belt" was cut as early as 1868 (Tehama County) to supply fuel and timber (e.g., fencing) as the valley was settled (Thompson 1961, p. 311). In addition to supplying lumber to a largely treeless valley, the trees that comprised the historic riparian forests of the Sacramento Valley (and likely other parts of the Central Valley) provided reinforcement to river banks and greater stability to stream channels (Thompson 1961, p. 315). These forests

also served as windbreaks, reducing the effects of wind and evapotranspiration, while providing important wildlife habitat (Thompson 1961, p. 315).

Much of the historically occurring riparian forests were lost in the Central Valley prior to the listing of the valley elderberry longhorn beetle (see summary for the Sacramento Valley by Thompson 1961, pp. 310–315). Katibah (1984, pp. 27–28) estimated approximately 102,000 ac (41,300 ha) of riparian forest remained in the Central Valley in 1984, a reduction of about 89 percent from an estimated total of 921,600 ac (373,100 ha) of pre-settlement riparian forest area. A Central Valley mapping effort, initiated in 1978 with legislation that provided funding to study the riparian resources of the Central Valley and desert (Riparian Mapping Team 1979, p. 1), presented an initial evaluation of the condition of riparian vegetation using remote sensing methods in 1981 (Katibah *et al*. 1981, entire; see also Katibah *et al*. 1984, entire), or 1 year after the listing of the valley elderberry longhorn beetle as threatened (45 FR 52803; August 8, 1980). This assessment used a qualitative condition index for each sample site and concluded that the conditions of riparian systems at that time were either disturbed, degraded, or severely degraded (85 percent), with 15 percent considered to be in good or "apparently unaltered" condition (Katibah *et al*. 1981, p. 245). About 34 percent of riparian systems were considered to be recovering or stable (Katibah *et al*. 1981, p. 245). Adjacent land uses (primarily agriculture), stream channelization, and livestock grazing were reported as important negative influences on riparian systems (Katibah *et al*. 1981, p. 244). Specifically, artificial levees, river channelization, dams, and water diversions were

identified as factors in reducing the original riparian forests to the remnant habitat described at that time for the Central Valley (Katibah 1984, p. 28).

Since that initial assessment, the Central Valley Historic Mapping Project has refined their estimates of historic natural vegetation for the Central Valley and has developed an accessible GIS-based analysis of vegetation changes over the past 100 years (Geographical Information Center (GIC) 2003, entire). Four maps (pre-1900, 1945, 1960, 1995) were created to illustrate eras in which significant land use changes occurred in the Central Valley, such as Anglo-American settlement and water diversion projects (GIC 2003, p. 3). Using a variety of methods and sources, this analysis estimated that 1,021,584 ac (413,420 ha) of riparian vegetation were found within the valley pre-1900, and about 132,586 ac (53,656 ha) of riparian vegetation remained in the Greater Central Valley in 2000, a reduction of 87 percent (GIC 2003, p. 14).

Based on results from a 2003 survey of 16 waterways (47 plots) in the Sacramento Valley (i.e., upper portion of the extant occurrences observed for the valley elderberry longhorn beetle), Hunter *et al*. (2003, p. 41) described the riparian vegetation along these waterways as "relatively narrow bands with an open, discontinuous canopy." This survey described many of these riparian zones as disturbed, with evidence of channel incision, overbank flows, and dumping of trimmed/cut tree branches, and they frequently contained some type of infrastructure (Hunter *et al*. 2003, p. 41). Surrounding land use (within 820 ft (250 m)) was characterized as 43 percent natural, 38 percent

agricultural, and 18 percent developed; only 17 percent of the plots were surrounded entirely by natural vegetation (Hunter *et al*. 2003, p. 41).

The Sacramento River represents one river system in the Central Valley within the northern range of the valley elderberry longhorn beetle that has been severely degraded through channelization, bank protection (e.g., levees and riprap), and effects related to the construction of the Shasta Dam and other foothill storage reservoirs (Golet *et al*. 2013, p. 3). Natural, but fragmented, habitats (e.g., riparian, grasslands, sloughs, and valley oak woodlands) remain along the Sacramento River (Golet *et al*. 2013, p. 5). The middle section of the river (Red Bluff to Colusa) has been the focus of restoration efforts following the passage of State legislation in 1986 (Senate Bill 1086), which mandated the development of a management plan to protect, restore, and enhance riparian vegetation along the river (Sacramento River Conservation Area Forum 2003, p. v). A comprehensive evaluation of the success of these efforts indicated that, while progress has been made in achieving goals related to plant species and communities (including an increase in elderberry shrubs) and some wildlife taxa, progress towards restoring stream flows and natural floodplain and flood processes has been poor (Golet *et al*. 2013, pp. 19–21). In addition, this evaluation found that the status of natural riverine habitats in this portion of the Sacramento River was, in general, poor and declining, which was attributed to continued human alterations that constrain the river's hydrologic and geomorphic processes (Golet *et al*. 2013, p. 22). One of the major factors identified as responsible for the continued degradation of riverine habitats was the installation of

riprap, which the study indicated has been steadily increasing along the Sacramento River since the 1930s (Golet *et al.* 2013, p. 22).

Assessment of Current Elderberry Habitat Relative to Metapopulation Structure of the Valley Elderberry Longhorn Beetle

As part of the Central Valley Flood protection efforts, Chico State University, the GIC, and CDFW's Vegetation Classification and Mapping Program have developed both a medium-scale and fine-scale dataset for riparian vegetation in the Central Valley (CDWR 2012b, pp. 5-1–5-9). The medium-scale map illustrates the extent of riparian vegetation using about 20 general vegetation classes (see CDFW 2014a and Central Valley Riparian Mapping Project (CVRMP) 2014 for website addresses). The fine-scale version provides a more detailed plant community resolution such that vegetation associations and alliances containing a range of probability of elderberry shrub occurrence within those associations and alliances can be identified; this map is nearly complete for the entire Central Valley. Both maps were created using imagery from the U.S. Department of Agriculture (USDA) National Agriculture Imagery Program (NAIP) from 2009 and current field sampling (USDA NAIP 2014).

In our proposed rule, we presented an estimate of 46,936 ac (18,994 ha) of protected riparian vegetation, which we stated may or may not contain elderberry shrubs (77 FR 60256, October 2, 2012). Rather than infer the amount of elderberry habitat from this gross estimate of riparian vegetation (which is what was presented in the proposed

rule), we instead use the mapped *Sambucus nigra* Alliances (described as blue elderberry) defined in the 2009 Central Valley fine-scale riparian vegetation data set (CDFW and GIC 2013) to better define the current extent of elderberry habitat in the Central Valley. We also assess the size of the defined polygons of elderberry and their location in the Central Valley relative to the presumed metapopulation structure identified for the valley elderberry longhorn beetle (Talley *et al*. 2006a, pp. 10–11). We acknowledge that elderberry shrubs likely occur in varying degrees of cover and constancy within other mapped vegetation alliances, but we are unable to accurately determine the extent and location of these areas based on the spatial information in these data sets and descriptions provided in Buck-Diaz *et al*. (2012, Appendix 4) for these other plant alliances; thus, our estimate of elderberry habitat is likely to be conservative.

The CDFW/GIC data set contains 39 blue elderberry polygons (124 ac (50 ha)) located within our presumed historical range for the valley elderberry longhorn beetle (see Figure 1). Using the metapopulation spatial parameters presented in Talley *et al*. (2006a, p. 11) (i.e., extent of 1,968–2,625 ft (600–800 m) defined as a cluster), we identified potential metapopulation clusters in our data set. We first determined which of the mapped elderberry polygons were less than 1,968 ft (600 m) from their nearest neighbor (16 of the 39 polygons), and merged these together to redefine these larger polygons. This resulted in 16 polygons merging into 4, for a new total of 27 mapped elderberry polygons. We then conducted a "bounding containers" GIS analysis (Service 2014, GIS analysis) for these 27 polygons to identify those (now rectangular) polygons where the diagonal was at least 1,968 ft (600 m), as this is the minimum distance (i.e.,

1,968–2,625 ft (600–800 m)) to meet Talley *et al.*'s (2006a, p. 11) criteria as a metapopulation cluster.

Based on this analysis, 3 of the 27 polygons had a longest length (i.e., diagonal) greater than 1,968 ft (600 m) and, therefore, could be considered as metapopulation clusters supporting a regional population of the valley elderberry longhorn beetle (Talley *et al.* 2006a, p. 11). These three elderberry clusters were located: (1) Along the Cosumnes River; (2) south of Marysville at the southern end of Clark's Slough; and (3) near an unnamed tributary of the Yuba River. All other mapped elderberry polygons were less than 1,968 ft (600 m) in extent.

We then evaluated the location of exit holes or beetle observations from 1997 to 2012 (Figure 2) relative to all 39 elderberry polygons. Based on the level of precision of the mapped locations, we find that 38 survey points out of a total of 1,422 (or less than 3 percent) were located within the 39 elderberry polygons.

These results could be interpreted in several ways (or in combination): (1) Relatively few stands of elderberry habitat remain within the Central Valley and their small size (average of 2.9 ac (1.17 ha)) and spatial arrangement may be insufficient to support the metapopulation structure defined for the valley elderberry longhorn beetle (Talley *et al.* 2006a, p. 11); (2) areas within the species' range have not been adequately surveyed; (3) the mapping methods used did not identify all areas of elderberry habitat; or (4) the parameters that define the presumed metapopulation structure or the life-history

requirements for the species need to be reevaluated. Occupancy surveys within the mapped elderberry polygons are needed to assess these or other possibilities.

Occupancy of Restoration and Mitigation Sites

As noted in our proposed rule (77 FR 60256–60258; October 2, 2012), efforts to establish areas of riparian vegetation (though not necessarily elderberry habitat) through restoration projects or mitigation requirements under the Act have been conducted in order to provide additional areas of habitat for the species. Rather than present rough estimates of the number of acres of protected riparian vegetation, as was done in the proposed rule, we are instead providing in this document a review of assessments of these areas conducted in the past 10 years. We modified this discussion from what was presented in the proposed rule based on comments received, as well as evaluated the success of some of these restoration and mitigation sites based on estimates of occupancy of the valley elderberry longhorn beetle.

An evaluation of restoration of riparian vegetation along 106 river km (66 river mi) of the Sacramento River included an assessment of valley elderberry longhorn beetle occupancy (exit holes) at five restoration sites (surveys conducted in 2003) (Golet *et al*. 2008, pp. 7–8). Older restoration sites (greater than 8 years) had a larger percentage (approximately 10 to 21 percent) of shrubs with exit holes (River Partners 2004, p. 3), likely due to the size class differential and observed preferences of the valley elderberry longhorn beetle for larger stem sizes.

A limited evaluation of (blue) elderberry and other riparian planting efforts at 30 mitigation sites over approximately 485 ac (196 ha) in the Central Valley (from Tehama County to Madera County) was undertaken in 2005 and 2006 to evaluate their success in establishing occupancy of the valley elderberry longhorn beetles (Holyoak and Koch-Munz 2008, entire). A spatial analysis of exit holes of all ages determined that the valley elderberry longhorn beetle was present at 16 of the 30 mitigation sites (53 percent) (Holyoak and Koch-Munz 2008, p. 447). As noted above, the abundance of the valley elderberry longhorn beetle per elderberry shrub and per stem in this study was also found to be positively related to the age of the mitigation site (Holyoak and Koch-Munz 2008, p. 449).

Holyoak *et al*. (2010, entire) reviewed publicly available mitigation monitoring reports (total of 60) to evaluate the success of mitigation sites in conserving the valley elderberry longhorn beetle, as measured by the survival of elderberry plants and how frequently the species colonized mitigation sites. Although this review noted that many expected mitigation reports were missing and thus highlighted the need for better data management practices, they found that the survival of both elderberry seedlings and transplants was highly variable and declined over time after planting (Holyoak *et al*. 2010, p. 48). Specifically, by year seven, 57 to 64 percent of transplanted elderberry survived, with 71 percent survival of seedlings (Holyoak *et al*. 2010, pp. 48–49). The study also found that the mitigation site (e.g., location, age) accounted for 25 percent of the variability in proportion of seedlings that survived, which suggested that the

mitigation site choice can have an important effect on the ability to establish elderberry plants (Holyoak *et al*. 2010, p. 49).

Summary of Available Habitat

There has been a significant loss and degradation of riparian and other natural habitats in the presumed historical range of the valley elderberry longhorn beetle, much of which occurred prior to the listing of the species. In our proposed rule, we noted that we could not accurately determine the potential lost historical range of valley elderberry longhorn beetle habitat, and that coarse estimates have been attempted based on historical losses of riparian vegetation (77 FR 60241; October 2, 2012). Rather than infer lost elderberry habitat from estimates of lost riparian forests, we include here a summary of current elderberry habitat (based on 2009 imagery) mapped within the Central Valley, and assess how these mapped areas conform to the metapopulation structure of the valley elderberry longhorn beetle as defined by species' experts. This preliminary assessment indicates that elderberry habitat remains limited in extent within the Central Valley and may not support the spatial requirements of sustainable metapopulations presumed for the valley elderberry longhorn beetle. We note that the results of this assessment do not allow us to draw definitive conclusions on the valley elderberry longhorn beetle metapopulation given the limitations of these data.

Occupancy rates of valley elderberry longhorn beetle in riparian vegetation at some mitigation sites provide some indication that the species has been successful in

colonizing these areas; however, monitoring is incomplete in both these areas and within restoration sites. Given the life-history traits defined for the valley elderberry longhorn beetle, as discussed in the **Background** section (i.e., habitat specialist, with limited mobility and a short adult life span, and low local numbers within a population structure), and the limited and fragmented habitat within its current range, we reaffirm our conclusion in the proposed rule that loss of habitat continues to remain a threat to the species. For this withdrawal, we reevaluated this threat in combination with the other threats described below and determined threats to the species and its habitat have not been reduced such that delisting is appropriate.

Levee and Flood Protection Infrastructure

As described in our proposed rule, the Central Valley contains an extensive flood protection system, much of which predates the listing of the valley elderberry longhorn beetle (77 FR 60251; October 2, 2012). The (California) State Plan of Flood Control (SPFC) represents a portion of the Central Valley flood management system for which the State has special responsibilities, as described in the California Water Code Section 9110 (f) (CDWR 2011, pp. 1–7). The SPFC Descriptive Document provides a detailed inventory and description of the levees (approximately 1,600 mi (2,575 km)), weirs, bypass channels, pumps, dams, and other structures included in the SPFC (CDWR 2010, entire). This flood protection system comprises federally and State-authorized projects for which the Central Valley Flood Protection Board or the California Department of Water Resources (CDWR) has provided assurances of cooperation to the Federal

Government. Other flood protection facilities in the Sacramento River and San Joaquin River watersheds that are not covered by these assurances are not part of this State-Federal system (CDWR 2010, p. Guide–1). Thus, the SPFC represents a portion of the larger system that provides flood protection for the Central Valley (CDWR 2010, p. Guide–1).

As noted in the proposed rule, ongoing and future maintenance of these flood protection elements may result in losses of riparian vegetation and elderberry shrubs in addition to what has been historically lost; however, we stated that we had no estimate of the acreage of riparian vegetation (or elderberry shrubs within these areas) on the flood protection levees or lands that provide additional flood facilities (77 FR 60252; October 2, 2012).

We also described in our proposed rule new flood control system maintenance requirements being implemented by the U.S. Army Corps of Engineers (Corps), specifically, the 2009 *Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures* (Engineering Technical Letter (ETL) 1110–2–571) (Corps 2009, entire). In general, this ETL 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 (Corps 2009, pp. 2-1–2-2, 6-1–6-2), which are practices that could eliminate occupied or unoccupied elderberry shrubs. On April 30, 2014, the Corps issued a new *Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures*

(ETL) 1110–2–583), superseding the 2009 ETL (Corps 2014, entire). The 2014 guidelines maintains the previous ETL guidelines of 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 (Corps 2014, pp. 2-1–2-3, A-2–A3).

At the time of our proposed rule, we indicated that the final policy guidance for the issuance of variances from the ETL vegetation standards for levees and floodwalls had not been released; therefore, we were unable to determine if this variance process would have an effect on levee segments containing woody vegetation (77 FR 60253; October 2, 2012). In this document, we provide an update to our discussion of this threat and include additional information relative to policies being implemented by CDWR to address levee vegetation management.

On February 17, 2012 (77 FR 9637), the Corps issued a notice for a Policy Guidance Letter (PGL) outlining the process for requesting this variance. The PGL applies to levees within the Corps' Levee Safety Program including those operated or maintained by the Corps, those that are federally authorized and locally operated and maintained, and those locally constructed and locally operated and maintained, but associated with the Corps' Rehabilitation and Inspection Program (77 FR 9637; February 17, 2012). However, in practice, the variance process has been described as time intensive and costly, even for just a few miles of levee (Qualley 2014, pers. comm.). Therefore, securing variances for the protection of elderberry shrubs or other riparian

vegetation found on levees under the Corps' jurisdiction may not be a practical option at this time.

The CDWR's Central Valley Flood Protection Plan (CVFPP) includes a Levee Vegetation Management Strategy to address the vegetation-free guidelines set out within the Corps' ETL (CDWR 2011, pp. 4-13–4-16). The approach states that it "reflects a flexible and adaptive management strategy that meets public safety goals, and protects and enhances sensitive habitats in the Central Valley" (CDWR 2012a, p. 1). Specifically, new levees would be constructed and managed consistent with the new policy, however, those levees with "legacy" trees would be managed to allow existing large trees and other woody vegetation to continue their normal life cycle unless they were considered to be an unacceptable threat to levee integrity (CDWR 2012a, p. 1). The CVFPP strategy also allows for the retention of waterside vegetation below the vegetation management zone (generally beyond the 20-ft (6.1-m) slope length from the levee crown) (CDWR 2011, p. 4-14). This CVFPP strategy is likely to provide, at least in the short term, a more protective mechanism for riparian vegetation, including elderberry shrubs, than the variance process outlined in the PGL (which as stated above is intensive, costly, and likely not practical).

The potential for the Corps to issue variances under the ETL guidance along with CDWR's strategy to address levee vegetation management do not change CDWR's obligation to meet Federal and State law with regard to valley elderberry longhorn beetle habitat and riparian vegetation (see *Factor D*) (Qualley 2014, pers. comm.).

The Water Resources Reform and Development Act (WRRDA) of 2014 (Public Law 113–121) contains a vegetation management policy provision (Title III, Subtitle B–Levee Safety, Section 3013) that requires the Corps to conduct a comprehensive review of its policy guidelines (i.e., ETL 1110–2–583 and PGL for requesting variances, as noted above) for management of vegetation on levees in consultation with other applicable Federal agencies, representatives of State, regional, local, and tribal governments, appropriate nongovernmental organizations, and the public. This may allow for more appropriate regional variances from the single national ETL standard currently outlined in the Corps' vegetation management policies. The WRRDA 2014 vegetation management policy provision also includes a requirement for the Corps to solicit and consider the views of independent experts on the engineering, environmental, and institutional considerations underlying the guidelines.

In summary, as we concluded in our proposed rule (77 FR 60254; October 2, 2012) and reaffirm in this document, levee vegetation management actions are expected to continue to impact elderberry shrubs within the range of the valley elderberry longhorn beetle. Threats related to removal of elderberry vegetation may be reduced in the future in some locations within the Central Valley based on revisions to the Corps' vegetation management policies as outlined in the 2014 WRRDA. Long-term impacts of levee vegetation management actions may be offset with implementation of mitigation (e.g., establishment of mitigation sites or restrictions on pruning); however, as described above and in our **Background** section, the success of mitigation sites in establishing occupancy

of the valley elderberry longhorn beetle has not been fully evaluated, so its success is currently indeterminable.

Road and Trail Use and Their Maintenance

Road and trail use and their maintenance and the effects of dust related to these activities are identified in our Recovery Plan and in Biological Opinions as threats to the quality of valley elderberry longhorn beetle habitat (Service 1984, p. 41; Service 2002, p. 3). As described in our proposed rule, machinery used in road maintenance activities can crush adjacent elderberry shrubs, or cause indirect stress to plants (e.g., leaf shading, blocked stomata) through the raising of dust (77 FR 60254; October 2, 2012). Similarly, dust can originate from access roads and recreational trails within riparian corridors where elderberry habitat is often found (Talley *et al*. 2006b, p. 648). Dust could also affect the survival and behavior of the valley elderberry longhorn beetle by smothering adults or larvae, disrupting chemical cues important for mating and detecting host plants, or creating unpalatable leaves or flowers (Talley *et al*. 2006b, p. 649).

As noted in our proposed rule (77 FR 60254, October 2, 2012), a rangewide study on the effects of dust to the valley elderberry longhorn beetle or its host plant has not been conducted. To better address this topic, we provide a summary of a study that evaluated dust effects that was not described in the proposed rule.

A study to test the effects of dust from dirt trails relative to paved trails was conducted along the American River Parkway in 2003 (Talley *et al*. 2006b, entire). The study found similar dust settlement rates and leaf dust accumulation along dirt and paved trails, but when data from all sites were pooled, elderberry plants tended to be more stressed (e.g., shorter plants, lower percent leaf water content, thicker leaves, higher percentage of dead stems) near dirt trails than paved surfaces (Talley *et al*. 2006b, p. 651), a result the authors attributed to factors other than dust (Talley *et al*. 2006b, p. 653). Talley *et al*. (2006b, p. 653) concluded the difference in elderberry characteristics near dirt trails was likely due to reduced water availability (less surface runoff than near paved surfaces) and less soil water (further distances from water sources). The authors also suggested that the effects of dust may be more significant over larger spatial scales given the variability of dust levels among and between the sites studied (Talley *et al*. 2006b, p. 653).

The study also looked at the relationships between the presence or absence of valley elderberry longhorn beetle and distances from dirt and paved surfaces. The authors found that the presence of new and 1-year-old valley elderberry longhorn beetle exit holes was independent of both trail location and surface type (Talley *et al*. 2006b, p. 654). Further, the study noted that valley elderberry longhorn beetle exit holes were found at all sites despite higher dust levels at some study sites, and concluded that levels of dust from dirt trails, paved trails, and access roads did not have a negative association with the presence of the species, despite the variability in condition of elderberry plants (Talley *et al*. 2006b, pp. 654–655).

In another study, Talley and Holyoak (2009, entire) evaluated how the proximity to highways and highway construction activities affects the occupancy of the valley elderberry longhorn beetle and condition of elderberry shrubs. Field surveys from 2006 to 2008 were used to evaluate the effects of particulates, pollutants, and noise along portions of several highways in the northern Central Valley of California (Talley and Holyoak 2009, pp. 2–3). The study included a laboratory analysis of effects to elderberry leaves (i.e., dust levels, leaf area, carbon to nitrogen ratios, and exhaust elements) and an evaluation of statistical relationships between the distances from either a construction site or highway edge and both dust accumulation rates and elderberry characteristics (Talley and Holyoak 2009, p. 4). The study found no effect of the proximity of highways on dust accumulations and few effects related to potentially toxic elements in elderberry leaves (Talley and Holyoak 2009, p. 9). Noise levels were found to decrease with distance from highways; however, noise levels were similar at sites located immediately adjacent to highways, despite differences in traffic volume (Talley and Holyoak 2009, p. 6).

The researchers determined that the type of habitat and availability of elderberry shrubs were the primary factors influencing the likelihood of the presence of either recent or total (recent and old) valley elderberry longhorn beetle exit holes; no relationships were observed between distance from highways and distribution of exit holes (Talley and Holyoak 2009, p. 6). However, the *amount* of available elderberry habitat was found to be significantly lower along roadsides, and elderberry stem densities were smaller in sites immediately adjacent to highways when compared to riparian or control sites, or

compared to remnant riparian and non-riparian scrub areas (Talley and Holyoak 2009, pp. 8–9). This was attributed to right-of-way management activities (e.g., mowing, pruning) rather than a direct stress effect of being located adjacent to highways (Talley and Holyoak 2009, p. 9).

These findings reinforce results of other studies in which a range of both elderberry quality and quantity characteristics have been found to influence the presence and abundance of the valley elderberry longhorn beetle (Talley and Holyoak 2009, p. 8; see *Habitat* discussion above in **Background** section). The authors of the highway study noted the need for additional larger scale studies as well as controlled experimental studies to test specific effects on valley elderberry longhorn beetle survival (e.g., an evaluation of whether roadside patches act as population sinks that attract individuals into areas that are not able to sustain populations (Pulliam 1988, pp. 658–660)) (Talley and Holyoak 2009, p. 11).

In summary, threats related to road and trail uses, and the effects of dust, do not represent significant impacts to the valley elderberry longhorn beetle. However, removal of elderberry shrubs along the roadways (for right-of-way management activities) is a more important factor and is discussed in more detail below (see discussion under *Pruning*).

Pruning

In our proposed rule, we briefly discussed pruning as part of a *Factor E* threat, termed Human Use (77 FR 60263; October 2, 2012). Because we consider pruning activities to be a potential threat related to destruction or modification of habitat, we discuss pruning as a separate *Factor A* threat and include results from a study that was not discussed in the proposed rule. Pruning or trimming of elderberry shrubs for highway or trail maintenance, or other purposes, is a common activity within the presumed extant occurrences of the valley elderberry longhorn beetle. Talley and Holyoak (2009, entire) conducted an experimental study to measure the effects of pruning of elderberry shrubs on the valley elderberry longhorn beetle and its host plant. Two experimental techniques (pruning and topping) were used within elderberry habitat found along portions of the American River Parkway (Talley and Holyoak 2009, p. 29). The pruning experiment was designed to mimic the trimming (i.e., 50 percent of all branches 1 in (2.5 cm) or less in diameter) of elderberry shrubs that overhang roads and trails, while the topping experiment was designed to evaluate the removal of the top 3.28 ft (1 m) of a shrub or group of shrubs that often occurs beneath power lines and overhead obstructions (Talley and Holyoak 2009, p. 30). The experiments used measures of elderberry survival, growth, and condition as well as the presence and abundance of new valley elderberry longhorn beetle exit holes (Talley and Holyoak 2009, p. 30). The study found no "short-term" (2–4 weeks) changes in the survival, growth, or condition in response to the two experiments (Talley and Holyoak 2009, p. 32).

In addition, laboratory analyses to evaluate nutrient and defense chemical content indicated that neither experimental treatment had detectable effects on elderberry

nutrition (Talley and Holyoak 2009, p. 32). The study also found that neither colonization nor loss of valley elderberry longhorn beetles from elderberry shrubs was affected by pruning or topping experiments; that is, the declines and increases in occupied shrubs was independent of trimming, and, if anything, was likely related to the initial presence of the species (Talley and Holyoak 2009, p. 31). The only negative effect reported from this experimental study was a temporary loss of habitat from the removal of stems, but these stems regrew, on average, within 3 to 4 years (Talley and Holyoak 2009, p. 33).

Based on the potential impacts from pruning described in the proposed rule, the pruning of elderberry shrubs, when conducted in accordance with the findings of experimental studies presented by Talley and Holyoak (2009, pp. 29–33), will likely have temporary impacts to the valley elderberry longhorn beetle. Additional experimental studies of the effects of pruning (e.g., at mitigation or restoration sites) would provide a more complete evaluation of the magnitude of this threat to the species.

Effects Related to Climate Change

In our proposed rule, we discussed the effects of climate change under *Factors A* and *E* (77 FR 60254–60255, 60262; October 2, 2012). We stated that we did not have information that would allow us to make meaningful predictions of the effects of changes in temperature and precipitation patterns relative to potential changes in elderberry habitat (77 FR 60255; October 2, 2012). We concluded in *Factor E* that climate change

was not a significant factor affecting the persistence of the valley elderberry longhorn beetle (77 FR 60262; October 2, 2012).

In this withdrawal, we discuss threats related to the effects of climate change in *Factors A* and *E*. In *Factor A*, we provide a more robust discussion of both observed and predicted effects to hydrological patterns related to climate change effects for the Central Valley based on state-wide and regional probabilistic estimates of temperature and precipitation changes for California (using downscaled data from both global circulation models and nested regional climate models), and also present results of climate assessment tools to illustrate these predicted effects. In *Factor E*, we discuss the effects of climate change related to the survivorship and reproductive success of the valley elderberry longhorn beetle.

Our analyses under the Act include consideration of observed or likely environmental changes resulting from ongoing and projected changes in climate. As defined by the Intergovernmental Panel on Climate Change (IPCC), the term "climate" refers to the mean and variability of different types of weather conditions over time, with 30 years being a typical period for such measurements, although shorter or longer periods also may be used (IPCC 2013a, p. 1450). The term "climate change" thus refers to a change in the mean or the variability of relevant properties, which persists for an extended period, typically decades or longer, due to natural conditions (e.g., solar cycles) or human-caused changes in the composition of atmosphere or in land use (IPCC 2013a, p. 1450).

Scientific measurements spanning several decades demonstrate that changes in climate are occurring. In particular, warming of the climate system is unequivocal and many of the observed changes in the last 60 years are unprecedented over decades to millennia (IPCC 2013b, p. 4). The current rate of climate change may be as fast as any extended warming period over the past 65 million years and is projected to accelerate in the next 30 to 80 years (National Research Council 2013, p. 5). Thus, rapid climate change is adding to other sources of extinction pressures, such as land use and invasive species, which will likely place extinction rates in this era among just a handful of the severe biodiversity crises observed in Earth's geological record (American Association for the Advancement of Sciences (AAAS) 2014, p. 17).

Examples of various other observed and projected changes in climate and associated effects and risks, and the bases for them, are provided for global and regional scales in recent reports issued by the IPCC (2013c, 2014), and similar types of information for the United States and regions within it can be found in the National Climate Assessment (Melillo *et al*. 2014, entire).

Results of scientific analyses presented by the IPCC show that most of the observed increase in global average temperature since the mid-20th century cannot be explained by natural variability in climate and is "extremely likely" (defined by the IPCC as 95 to 100 percent likelihood) due to the observed increase in greenhouse gas (GHG)

concentrations in the atmosphere as a result of human activities, particularly carbon dioxide emissions from fossil fuel use (IPCC 2013b, p. 17 and related citations).

Scientists use a variety of climate models, which include consideration of natural processes and variability, as well as various scenarios of potential levels and timing of GHG emissions, to evaluate the causes of changes already observed and to project future changes in temperature and other climate conditions. Model results yield very similar projections of average global warming until about 2030, and thereafter the magnitude and rate of warming vary through the end of the Century depending on the assumptions about population levels, emissions of GHGs, and other factors that influence climate change. Thus, absent extremely rapid stabilization of GHGs at a global level, there is strong scientific support for projections that warming will continue through the 21st century, and that the magnitude and rate of change will be influenced substantially by human actions regarding GHG emissions (IPCC 2013b, 2014; entire).

Global climate projections are informative, and, in some cases, the only or the best scientific information available for us to use. However, projected changes in climate and related impacts can vary substantially across and within different regions of the world (e.g., IPCC 2013c, 2014; entire) and within the United States (Melillo *et al*. 2014, entire). Therefore, we use "downscaled" projections when they are available and have been developed through appropriate scientific procedures, because such projections provide higher resolution information that is more relevant to spatial scales used for

analyses of a given species (see Glick *et al*. 2011, pp. 58–61, for a discussion of downscaling).

Various changes in climate may have direct or indirect effects on species. These may be positive, neutral, or negative, and they may change over time, depending on the species and other relevant considerations, such as interactions of climate with other variables such as habitat fragmentation (for examples, see Franco *et al.* 2006; Forister *et al*. 2010; Galbraith *et al*. 2010; Chen *et al*. 2011; Bertelsmeier *et al*. 2013, entire). In addition to considering individual species, scientists are evaluating potential climate change-related impacts to, and responses of, ecological systems, habitat conditions, and groups of species (e.g., Deutsch *et al*. 2008; Berg *et al*. 2010; Euskirchen *et al.* 2009; McKechnie and Wolf 2010; Sinervo *et al*. 2010; Beaumont *et al*. 2011; McKelvey *et al*. 2011; Rogers and Schindler 2011; Bellard *et al*. 2012).

As an example, Hickling *et al*. (2006, entire) analyzed the changes in distributions of groups of vertebrates and invertebrates, including longhorn beetles, in Great Britain to determine whether range shifts (both in latitude and elevation) have occurred over an approximately 25-year time span. For 11 species of longhorn beetles, the study found that, for grid squares (6.2 mi (10 km)) considered to be well-recorded (i.e., those that had at least 10 percent of that group recorded present in both study time periods), there was an average shift northward of 27 mi (43 km) and an average elevational shift of 86 ft (26 m) from 1960–1970 to 1985–1995 (Hickling *et al*. 2006, pp. 451–453). The authors stressed the importance of recognizing that observed distribution shifts due to climate

change are occurring concurrently with changes in land use and other environmental factors (Hickling *et al*. 2006, p. 454).

Effects from climate change in California, with its watersheds dominated by snowmelt hydrology, are expected to have important impacts to hydrological processes that will cascade into human and ecological systems at many scales (Kiparsky *et al*. 2014, p. 1). Likely effects include a reduction in snowpack and stream flow as well as changes in stream flow patterns, all of which present significant challenges in a State in which water, energy, agricultural, and ecological systems are linked together (Barnett *et al*. 2008, p. 1082). These effects have recently been summarized by hydrologic region in the California Department of Water Resources Public Review Draft of the *California Water Plan* (CWP) *Update 2013* (CDWR 2013). The CWP describes future actions that are intended to move California toward a more sustainable management of water resources and more resilient water management systems, and identifies objectives to support environmental stewardship (CDWR 2013, p. ES–1). Two hydrologic regions—the Sacramento River and the San Joaquin River—defined in the CWP encompass nearly all of our presumed extant occurrences (Figure 2) of the valley elderberry longhorn beetle (Fresno County not included). A summary of climate change effects projected for these two regions is described in the paragraphs below.

Regional temperature observations for assessing climate change are often used as an indicator of how climate is changing, and the Western Regional Climate Center (WRCC) has defined 11 climate regions for evaluating various climate trends in

California (Abatzoglou *et al*. 2009, p. 1535). These climate regions have different boundaries for California than the CWP hydrologic regions, but are considered to be more representative of California's diverse climatic regimes than standard climate divisions (Pierce *et al*. 2013, p. 843). The relevant WRCC climate regions for the distribution of the valley elderberry longhorn beetle are the Sacramento–Delta and the San Joaquin Valley regions.

Two indicators of temperature, the increase in mean temperature and the increase in maximum temperature, are important for evaluating trends in climate change in California. For the Sacramento–Delta climate region, linear trends (evaluated over a 100-year time period) indicate an increase in mean temperatures (Jan–Dec) of approximately 1.96 °F (1.09 °C) since 1895, and 3.0 °F (1.67 °C) since 1949 (WRCC 2014a). For the San Joaquin Valley climate region, the 100-year trend in mean temperature (Jan–Dec) indicates an increase of approximately 1.4 °F (0.78 °C) since 1895, and 2.62 °F (1.45 °C) since 1949 (WRCC 2014c). Similarly, the maximum temperature 100-year trend for the Sacramento-Delta region shows an increase of about 1.42 °F (0.8 °C) since 1895, and 1.92 °F (1.07 °C) since 1949 (WRCC 2014b). The maximum temperature 100-year trend for the San Joaquin Valley climate region shows an increase of about 0.38 °F (0.21 °C) since 1895, and 1.09 °F (0.60 °C) since 1949 (WRCC 2014d). It is logical to assume the rate of temperature increase for both regions is higher for the second time period (since 1949) than for the first time period (since 1895) due to the increased use of fossil fuels in the 20th century.

Although these observed trends provide information relative to how climate has changed in the past, climate science models are used to simulate and develop future climate projections (CDWR 2013, p. SR–76). Pierce *et al*. (2013, entire) presented both state-wide and regional probabilistic estimates of temperature and precipitation changes for California (by the 2060s) using downscaled data from 16 global circulation models and 3 nested regional climate models. The study looked at a historical (1985–1994) and a future (2060–2069) time period using the IPCC Special Report on Emission Scenarios A2 (Pierce *et al*. 2013, p. 841), which is an IPCC-defined scenario used for the IPCC's Third and Fourth Assessment reports, and is based on a global population growth scenario and economic conditions that result in a relatively high level of atmospheric GHGs by 2100 (IPCC 2000, pp. 4–5; see Stocker *et al*. 2013, pp. 60–68, and Walsh *et al*. 2014, pp. 25–28, for discussions and comparisons of the prior and current IPCC approaches and outcomes). Importantly, the projections included daily distributions and natural internal climate variability (Pierce *et al*. 2013, pp. 852–853).

Simulations using these downscaling methods project an increase in yearly temperature for the Sacramento–Delta climate region ranging from 1.9 °C (3.42 °F) to 2.8 °C (5.04 °F) by the 2060s time period (Pierce *et al*. 2013, p. 844), compared to 1985–1994. For the San Joaquin Valley climate region, the simulations show an increase in average yearly temperature ranging from 3.6 °F (2.0 °C) to 5.04 °F (2.8 °C) by the 2060s (Pierce *et al*. 2013, p. 844). The simulations indicated an upper temperature increase of 4.14 °F (2.3 °C) from 1985–1994 to 2060–2069 (averaged across models) for both the Sacramento–Delta and San Joaquin Valley regions (Pierce *et al*. 2013, p. 842).

We also reviewed projections from Cal-Adapt, a web-based, climate adaptation planning tool that synthesizes existing downscaled climate change scenarios and climate impact research, and presents the predictions in an interactive, graphical layout (California Energy Commission 2011). Projections of changes in annual averages in temperature for the Central Valley using the Cal-Adapt Climate tool indicate an increase in temperature ranging from about 3.4–3.8 °F (2.0–2.1 °C) under the IPCC low emissions scenario (B1), to an increase in temperature ranging from 6.0–6.6 °F (3.4–3.7 °C) under the IPCC higher emissions scenario (A2) (Cal-Adapt 2014a). Both of these scenarios represent comparisons between the baseline period (1961–1990) and the end-of-century period (2070–2090). The Cal-Adapt projection of an increase of about 2.0 °C (3.4 °F) in annual average temperature is very similar to the lower end of the range of yearly temperature simulations presented by Pierce *et al*. (2013, entire) for both regions with the A2 emissions scenario.

Precipitation patterns for California are quite variable year to year. Based on paleoclimatic data (e.g., tree-ring reconstructions of streamflow and precipitation), hydrologic conditions in California (and the west) are naturally widely varying, and include a pattern of recurring and extended droughts (CDWR 2008, p. 3). However, the 100-year trends for the Sacramento–Delta and San Joaquin Valley regions indicate a large change in the rate of increase (or, in some cases, a decrease) in precipitation over the winter months (December–February), which is generally when the Central Valley receives the bulk of its rainfall for the year. For the Sacramento–Delta region, rainfall

data from WRCC show a 100-year linear trend in winter of an increase in precipitation of 2.26 in (5.74 cm) from 1895 to present (February 2014), but an increase of only 0.53 in (1.35 cm) from 1975 to present (WRCC 2014e). Similar precipitation patterns are found in the San Joaquin Valley region; that is, in winter months, there is an increase in precipitation of 0.52 in (1.35 cm) for the 100-year trend beginning in 1895 to present, but a 1.05-in (2.67-cm) decrease for the 100-year trend beginning in 1975 to present (WRCC 2014f). The 100-year trends beginning in 1975 and ending at present (February 2014) for both regions show great variability, which is likely due, in part, to the shorter time period being evaluated. However, observed changes in hydrologic patterns (i.e., low-frequency changes in the hydrological cycle such as river flow, temperature, and snowpack) over the western United States from 1950 to 1999 have been found to be partially attributed to the effects of climate change (Barnett *et al*. 2008, p. 1080).

Downscaled probabilistic climate models were also used by Pierce *et al*. (2013, pp. 848–852) to evaluate changes in precipitation patterns for California resulting from the effects of climate change. Annual averages show different patterns in precipitation changes than those by season; that is, model results indicate increases in winter (December–February) precipitation for the Sacramento–Delta and San Joaquin Valley climate regions of 5 percent and 1 percent, respectively (averaged across all models, comparing the mean over the 1985–1994 time period to the mean over 2060–2069) (Pierce *et al*. 2013, p. 849). However, these wetter conditions in winter are largely offset by drier conditions predicted for the remainder of the year (e.g., 4 to 20 percent decrease in precipitation for the Sacramento–Delta region) (Pierce *et al*. 2013, p. 849). Model

results for the yearly change in precipitation indicate a 3 percent decrease in precipitation for the Sacramento–Delta, and a 6 percent decrease for the San Joaquin Valley region (averaged across all models, using mean changes over the 1985–1994 time period compared to 2060–2069) (Pierce *et al*. 2013, pp. 848–849).

Changing precipitation patterns and resultant changes in hydrologic conditions are already being observed for California. In the last century, the average early spring snowpack in the Sierra Nevada decreased by about 10 percent, which represents a loss of 1.5 million acre-feet of snowpack storage (CDWR 2008, p. 3). We reviewed Cal-Adapt projections for snowpack for the western Sierra Nevada region of California, which supplies water to many of the river systems within the eastern portion of the Central Valley. Projected changes in April snow water equivalence across the western Sierra Nevada region (eastern edge of the Central Valley) indicate about an 80 percent reduction in snow moisture under a low emissions scenario (B1); and about a 90 percent reduction in snow moisture under a high emissions scenario (A2), between a baseline time period (1961 to 1990) and an end-of-century period (2070 to 2090) (Cal-Adapt 2014b).

A downscaled simulation of the potential impacts of climate warming on hydrology and water supply operations was developed expressly for the Tuolumne and Merced River basins in California (Kiparsky *et al*. 2014, entire), which includes the southeastern portion of the valley elderberry longhorn beetle's current range. Although the simulation model (based on a Water Evaluation and Planning model) was developed primarily to evaluate water supply concerns for urban, agricultural, and environmental

uses, the results are important as they relate to predicted effects to streamflow and timing of hydrological events in this portion of the Central Valley. In response to climate warming scenarios (2 °C, 4 °C, and 6 °C increases), the simulation indicated a shift in timing and magnitude of seasonal flows for these two basins; that is, earlier snowmelt and a subsequent 3-month earlier shift in the water year for peak flows (Kiparsky *et al*. 2014, p. 10).

Finally, Huang *et al*. (2012, entire) conducted a hydrologic and sensitivity analysis specifically for a portion of the Sacramento River climate region, the Upper Feather River watershed, which represents another snow-dominated watershed in California. Using six global climate models (GCMs) with two IPCC emissions scenarios (A2 and B1), the results of a model based on a Precipitation–Runoff Modeling System indicate significant changes in streamflow timing and increases in both frequency and magnitude of extreme flows (Huang *et al*. 2012, p. 138). Although the authors stress the uncertainty in the model results, the simulation found, for example, that with a 4 °C (7.2 °F) warming, there was an 11 percent increase in the 100-year annual maximum daily flow and a 35 percent decrease in the 10-year minimum 7-day flow (i.e., drought condition) (Huang *et al*. 2012, p. 147). The increase in annual peak flow was attributed to the combined effect of more rainfall and less snowmelt with climate warming during winter months (January–March) (Huang *et al*. 2012, p. 147).

As described above, the survival and reproduction of the valley elderberry longhorn beetle, is dependent on two elderberry taxa, which in turn are dependent upon

ecological processes supported by climatic conditions (precipitation and temperature) and other environmental factors (e.g., elevation). Effects from climate change on the riparian ecosystems upon which the valley elderberry longhorn beetle depends are expected to include an increase in the intensity of both wet and dry periods due to changes in hydrologic conditions within those California watersheds driven by snowmelt, which is likely to alter streamflow patterns for the riverine systems that occupy the Sacramento–Delta and San Joaquin Valley regions (CDWR 2013, pp. SJR-73–SJR-75, SR-76–SR-78 and references cited therein). Altered flow regimes (both volume and timing) will influence the mechanisms that support riparian plant communities, including elderberry habitat. Shifts in location and species composition of riparian vegetation can occur due to changes in groundwater and surface water levels (Kløve *et al*. 2013, p. 3).

The effects of climate change are also expected to result in increased temperatures for the Central Valley, and, when combined with current trends and future changes in hydrologic patterns (e.g., timing of snowmelt and peak flows), will result in an increase in the frequency and duration of drought conditions in California. Hanson *et al*. (2012, entire) presented a supply and demand modeling framework to simulate and analyze potential climate change effects on conjunctive uses of water resources within California's Central Valley from 2000–2100. This simulation and analysis (linking downscaled GCM simulation results, the A2 or rapidly increasing GHG emissions scenario, with regional hydrologic models) includes the demands, uses, and movements of water for irrigation and natural vegetation, runoff from local mountains, and the responses of supply from groundwater and streamflow (Hanson *et al*. 2012, p. 3).

Results from the simulation include intermittent climatic droughts from 2000–2050 and sustained droughts in 2050–2100 due to reduced precipitation (Hanson *et al*. 2012, p. 11). The drought events were found to have significant effects on surface water and groundwater deliveries and are likely to produce secondary effects, including a reduction in water for riparian vegetation and surface water deliveries (Hanson *et al*. 2012, pp. 11, 19). The simulated changes also produce large declines in flows draining into the Central Valley from the surrounding mountain watersheds, with a decline of over 45 percent of potential total basin discharge by 2100 (Hanson *et al*. 2012, p. 11). Reductions in streamflow diversions in this scenario are, therefore, expected for riparian vegetation and irrigation uses, including the Tuolumne River, the San Joaquin Basin, and Bear River in the Sacramento Valley Tulare Basin (Hanson *et al*. 2012, p. 12). Additionally, the reduction in surface water diversions increases the demand for groundwater pumping, negatively affecting groundwater levels (Hanson *et al*. 2012, p. 12) and further reducing water levels within riparian systems, and likely causing significant land subsidence along the southeastern San Joaquin and Sacramento Valleys (Hanson *et al*. 2012, p. 20).

Other predictions of riparian vegetation changes related to climate-driven hydrological changes have found reductions in species-rich riparian forests (boreal river system in northern Sweden) (Ström *et al*. 2012, pp. 54–56) or shifts in successional phases of riparian vegetation (Mediterranean rivers) (Rivaes *et al*. 2013, entire).

Predicted effects on both surface and groundwater availability are likely to negatively affect the regeneration and sustainability of riparian vegetation, including elderberry shrubs, though we are unaware of any comprehensive evaluation of specific responses of this host plant. The predicted changes in hydrologic conditions are also likely to favor the spread of invasive plants.

In summary, the best available data indicate that climate change effects will add to the destruction and modification of habitat for the valley elderberry longhorn beetle both currently and in the future. Although, we are unable to assess in specific quantitative terms the magnitude of the impact due to the uncertainty relative to climate change effects that will occur and the degree to which hydrology and water diversions will be affected, the best available data indicate long-term climate change effects will continue to have an overall negative effect on the available habitat throughout the range of the valley elderberry longhorn beetle.

Invasive Plants

Competition for resources between elderberry plants and invasive plants and effects to elderberry habitat from invasive plants were not included as potential threats in our 2006 5-year review (Service 2006a, entire) or in our proposed rule, though we concluded in the proposed rule that these threats were not well-studied and had not been identified as widespread threats to the species or its habitat (77 FR 60250, October 2, 2012). However, the natural plant communities of the Central Valley have been altered

by removal of native trees, as described above, and by the rapid spread of invasive plants following the influx of immigrants and livestock into the area during the gold rush era (Mack 1989, p. 165). As an example, the replacement of native plants, particularly within grassland communities, by nonnative annual grasses was nearly complete by 1880 (Mack 1989, p. 166). Based on comments received from peer reviewers and additional information not assessed in the proposed rule, we include here an updated and more detailed discussion of effects to the valley elderberry longhorn beetle from invasive plants to better assess this potential threat.

The Central Valley, as with other parts of California, continues to experience new invasions (e.g., California Invasive Plant Council Symposium 2003, entire). The California Invasive Plant Council (Cal–IPC) has developed an interactive website (CalWeedMapper 2014) that illustrates invasive plant distributions based on occurrence data and suitable range modeling using climate data. CalWeedMapper was designed as a strategic tool to identify management opportunities for control and eradication of invasive plants. County and regional species maps and associated reports can be created for individual invasive species that describe their abundance, trends, and spatial distribution. Although the information may contain errors (i.e., misidentifications or imprecise location information), the maps provide useful information on current distributions and trends of invasive plants in California.

Talley (2005, p. 18) observed a short-term positive effect to the valley elderberry longhorn beetle from the invasive black locust (*Robinia pseudoacacia*) (a nitrogen-fixing

tree); however, this plant has the potential to displace native plants in riparian communities (Hunter 2000, p. 275), which can negatively affect the long-term survival of elderberry plants (Talley 2005, p. 33). Using CalWeedMapper, we were able to create a regional (Central Valley) report and map for black locust (Cal-IPC 2014b). Within the presumed extant occurrences of the valley elderberry longhorn beetle, there is a spreading trend for this invasive plant in Butte County (Cal-IPC 2014b). This invasive plant is also considered to be "medium" in abundance in parts of Sacramento County and is "low" in several other areas within the northern portion of the Central Valley where the valley elderberry longhorn beetle has been observed (Cal-IPC 2014a). Black locust is also illustrated as "spreading" in several areas of California outside of the Central Valley (Cal-IPC 2014b).

The spread of invasive plant species is expected to become more severe in association with future changes in climate, such as drought (e.g., Bradley *et al*. 2010, entire). For example, the black locust is described as being drought tolerant, and as propagating easily from seeds and having seeds that spread easily (Benesperi *et al*. 2012, p. 3556; see also Temperate Climate Permaculture 2014). In studies elsewhere, forest plant diversity has been shown to decrease in areas where the black locust has spread Benesperi *et al*. 2012, pp. 3560–3561), and a recent experimental study concluded that its nitrogen-fixing ability appears to give this species a competitive advantage under drought conditions (Wurzburger and Miniat 2013, pp. 1120–1125). A commercial horticulture website describes black locust as a species that is suitable for use in times of climate change due to its adaptability to heat and water stress (SilvaSelect 2014). As noted

above, the CalWeedMapper provides maps with general information on current distributions and trends of invasive plants in California; the maps do not, however, include projections of future distribution in relation to climate change projections. Based on the available scientific information about the black locust, we expect that its range will continue to expand in response to increased temperatures and drought projected for the range of the valley elderberry longhorn beetle (see above for climate change projections).

Black walnut (*Juglans hindsii*), an invasive plant found on riparian floodplains along the Sacramento River, is strongly associated with elderberry and may also be invading formerly open elderberry habitat (Vaghti *et al*. 2009, pp. 33–35). Black walnut is also considered a nonnative woody plant in the Sacramento Valley, having become established in riparian zones since its introduction into the valley in the latter 19th and early 20th centuries as an ornamental plant or as root stock for English walnut (*Juglans regia*) (Hunter *et al*. 2003, p. 41). As such, black walnut has been described as the most widespread nonnative in the Sacramento Valley, based on 47 plots surveyed along 16 streams in the valley and adjacent foothills in 2003 (Hunter *et al*. 2003, pp. 39–46), including many areas where the valley elderberry longhorn beetle has been observed (e.g., Feather River, American River, Butte Creek, Big Chico Creek).

Chinese tallowtree (*Triadica sebifera*, formerly *Sapium sebiferum*) is a deciduous tree native to east Asia that has become a major invasive species in the southeastern United States and, since its introduction as a shade tree in urban areas of California, has now begun to spread in riparian areas of California (Cal-IPC 2014c). This invasive plant

has been difficult to eradicate once established (Bower *et al*. 2009, p. 393). Bower *et al*. (2009, entire) evaluated the invasion potential of Chinese tallowtree in California's Central Valley. This study found that this invasive species can colonize areas that are immediately adjacent to water sources; though drought-intolerant seedlings appear to restrict colonization in drier (higher elevation) areas (Bower *et al*. 2009, pp. 387, 393). CalWeedMapper illustrates a spreading trend of Chinese tallowtree for areas within Butte, Yuba, Sutter, and Sacramento Counties (Cal-IPC 2014c). Bower *et al*. (2009, p. 387) reported naturalizing populations of this invasive species along the Sacramento, San Joaquin, and American Rivers.

Hunter *et al*. (2003, pp. 42, 45) also described a patchy distribution of a large number of other woody nonnative plants (i.e., not including black walnut) in these riparian zones, but with relatively low abundance (less than 1 to 15 percent mean cover). However, the study indicated that some species (e.g., tree-of-heaven (*Ailanthus altissima*), Chinese tallowtree, scarlet wisteria (*Sesbania punicea*), tamarisk (*Tamarix* sp.)) are likely expanding their ranges and increasing in abundance in the Central Valley (Hunter *et al*. 2003, p. 42). In addition, this study also noted that the nonnative Himalayan blackberry (*Rubus discolor*) was the typical dominant plant in the well-developed shrub layer of the riparian zones surveyed (34 percent mean cover, where present; observed in 70 percent of the plots surveyed) (Hunter *et al*. 2003, p. 42). Finally, Golet *et al*. (2013, pp. 14, 17) found that the areal extent of several nonnative, invasive plants had increased in riparian zones along one section of the Sacramento River (Red

Bluff to Colusa) from 1999 to 2007, including an increase in black walnut within restoration and remnant riparian sites.

Vegetation type conversion or other shifts in native plant communities due to invasive plants represents environmental changes that are likely to have a negative effect on the metapopulation dynamics of the valley elderberry longhorn beetle. Although there are reported trends of expansions of invasive and nonnative plants (e.g., black locust, black walnut) within the presumed extant occurrences of the valley elderberry longhorn beetle, we are not aware of comprehensive studies evaluating their range-wide effects on occupied or suitable habitat of the valley elderberry longhorn beetle.

In summary, at this time, the best available scientific and commercial information indicates potential impacts from invasive nonnative plants (i.e., competition of resources to the host plant) to the valley elderberry longhorn beetle and its habitat. Although additional studies are needed to better characterize the magnitude or impact of this threat to the species both in localized areas as well as across the species' range, the best available data indicates that without control of invasive nonnative plants, their spread is anticipated to increase and will result in further degradation of habitat and loss of host plants for the valley elderberry longhorn beetle.

Summary of Factor A

We identified in the proposed rule and reaffirm in this document that there has been significant loss and degradation of riparian and other natural habitats in the presumed historical range of the valley elderberry longhorn beetle, much of which occurred prior to the listing of the species. Based on the best available information, occupancy estimates of the valley elderberry longhorn beetle range between 16 and 21 percent within its historical range, within fragmented riparian vegetation (see **Background** section). Our preliminary analysis of mapped elderberry habitat presented in this document indicates that limited areas of elderberry plant communities remain in the Central Valley and their spatial arrangement may not support valley elderberry longhorn beetles' presumed metapopulation structure. Restoration and mitigation sites have contributed to available habitat, with one evaluation indicating a long-term mitigation trend for survival of elderberry plants of 57 to 71 percent and an occupancy rate of the valley elderberry longhorn beetle (based on observations of exit holes only) of 43 to 53 percent (see also discussion in **Background** section). However, comprehensive surveys have not been completed at all conservation areas, including restoration sites and preserves. Colonization rates, where measured, are relatively low at many of these sites. Our new assessment of habitat (occupied or unoccupied) presented in this document, when considered in the context of the limited occurrence records (based on our reevaluation of occurrence information presented in the proposed rule and described in the **Background** section above), confirms a rare, patchy distribution pattern of the valley elderberry longhorn beetle across its presumed historical range in the Central Valley.

Threats to the valley elderberry longhorn beetle's host plant due to effects related to levee vegetation management are likely to continue given the Corps levee vegetation management guidance and the difficulty in obtaining a variance for this policy. A levee vegetation strategy defined by CDWR for some facilities in the Central Valley may, in the short term, result in fewer impacts to elderberry shrubs found on flood control levees. However, we are uncertain if this strategy will be effective in providing protection to elderberry shrubs found within these areas of the Central Valley.

Impacts related to road and trail uses, and the effects of dust from roads, trails, or highways adjacent to host plants or beetles are not considered to be threats to the species or its habitat, but loss of habitat at locations adjacent to roads, trails, and associated infrastructure remains a threat. Pruning activities, if conducted appropriately, can result in a temporary loss of the host plant of the valley elderberry longhorn beetle and monitoring of these activities is necessary to ensure that elderberry characteristics important to the life history of the beetle are preserved. Invasive nonnative plants may be impacting the species through modification or loss of habitat due to competition for space and resources with its host plant, but additional information is needed to evaluate the magnitude of this threat.

Climate models developed for evaluating climate change effects in California, including the Central Valley, indicate increased temperatures and significant changes to hydrologic conditions as a result of the effects of climate change. These changes are expected to affect riparian systems and other habitats where the presence of the valley

elderberry longhorn beetle has been observed in the Central Valley, and will be compounded by water supply needs for urban and agricultural uses. Drought conditions are also likely to become more common in California and will affect the survival of elderberry. At this time, the best available data indicate that climate change effects include the threatened destruction or modification of habitat through at least the 2060s for the valley elderberry longhorn beetle.

In summary, the loss or modification of additional habitat represents a continued threat to this population structure (see Cumulative Effects below for additional discussion). Therefore, the best scientific and commercial information available indicates that the destruction, modification, or curtailment of the valley elderberry longhorn beetle's habitat or range is likely to continue to be a threat to the species now and in the future.

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

We did not identify collecting or overutilization for any purpose as a threat to the valley elderberry longhorn beetle in our final listing rule (45 FR 52805; August 8, 1980) or in our proposed rule to delist the species (77 FR 60259; October 2, 2012). Based on our review of the available scientific and commercial information, we believe that overutilization for commercial, recreational, scientific, or educational purposes is not a

threat to the valley elderberry longhorn beetle at the present time nor do we anticipate this activity to be a threat in the future.

Factor C. Disease or Predation

At the time of listing, we did not identify disease or predation as factors affecting the status of the valley elderberry longhorn beetle (45 FR 52805; August 8, 1980). We know of no diseases that represent current threats to the valley elderberry longhorn beetle.

In our 5-year review and in the proposed delisting rule, we indicated that Argentine ants may be a potential predator of the valley elderberry longhorn beetle (Service 2006a, pp. 12–13; 77 FR 60259, October 2, 2012). In this withdrawal, we reexamine the available information regarding this potential predator as a threat to the species and include information from additional studies not evaluated in the proposed rule.

Based on sampling at sites within Putah Creek, a negative relationship was observed between the presence of Argentine ants and the valley elderberry longhorn beetle, which was attributed to: (1) Native ants were found to be positively associated with the valley elderberry longhorn beetle; and (2) native ants were found at only one site in which Argentine ants were present (Huxel 2000, pp. 83–84). Argentine ants were recorded at 14 of 15 mitigation sites along the American River Parkway during surveys in

2003 and 2004 (Klasson *et al*. 2005, p. 8); their presence was attributed to introduction of ants with elderberry seedlings supplied from nurseries and the use of irrigation at these sites, the latter of which is suspected of encouraging an increase in ant populations (Klasson *et al*. 2005, p. 8).

Argentine ants have rapidly expanded their range in California since first recorded in San Bernardino County in 1905 (Vega and Rust 2001, p. 5). Within its native Argentina, Argentine ants coexist with many ant species (Suarez *et al*. 1999, p. 51), including competitive dominants such as imported red fire ants (*Solenopsis invicta*) and black fire ants (*S. richteri*) (Holway *et al*. 2002, p. 195). However, in riparian communities in California, Argentine ant colonies are known to displace native ants (Kennedy 1998, pp. 347–348) and have the potential to displace other native insects (see review by Holway *et al*. 2002, entire). Thus, the absence of the native competitors throughout much of the introduced range of the Argentine ant is likely an important factor influencing its high abundance and expansion (Holway *et al*. 2002, p. 195). An additional concern is that climate-based modelling conducted to examine potential changes in the global distribution of the Argentine ant by mid-century shows that California will be one of the areas with the most suitable conditions for this species (Roura-Pascual *et al*. 2004, pp. 2531–2532), and additional modeling has yielded very similar results (Hartley *et al*. 2006, pp. 1073–1077; Roura-Pascual *et al*. 2011, p. 223). Although these modeling efforts cannot provide precise locations of suitability (see Menke *et al*. 2009, entire), they nevertheless provide consistent indications of the general area in central California where climate conditions will be favorable for Argentine ants.

Also, in addition to climate, the establishment and spread of Argentine ants is related to human-modified habitats (Roura-Pascual *et al*. 2011, p. 223; Fitzgerald and Gordon 2012, pp. 534–536), which are prevalent within the range of the valley elderberry longhorn beetle.

In New Zealand, where the Argentine ant has been an invasive species for more than 30 years, populations of the species disappeared after 10–20 years (with persistence near the high end of this range being associated with areas having warmer temperatures) at about 40 percent of 150 surveyed sites, and populations were reduced in some other areas (Cooling *et al*. 2011, p. 431). The reasons for this change are not known, and we do not know of any data indicating something similar is occurring in California.

Argentine ants are opportunistic in their feeding behavior (Rust *et al*. 2000, p. 209). Experiments in which mealworm larvae were tethered (tied) to live elderberry stems next to traps (made from sticky tape) conducted by Klasson *et al*. (2005, pp. 7–8) along the American River Parkway area found that, when provided the opportunity, the Argentine ant will increase its mortality (predation) of vulnerable larvae. Specifically, the study found a significant correlation between both a decrease of intact larvae and an increase in partially eaten larvae with an increase in Argentine ant density (Klasson *et al*. 2005, p. 8). Field experiments have shown that, when valley elderberry longhorn beetle larvae were placed on elderberry plants, they were readily attacked by Argentine ants (Talley 2014c, pers. comm.). Argentine ants have also been observed interfering with adult behaviors of the valley elderberry longhorn beetle (Talley 2014b, pers. comm.).

Relatively high densities of Argentine ants (based on the ant traps) have been reported at mitigation sites (Klasson *et al*. 2005, p. 8). Elderberry plants are found in areas that are also favorable to the establishment of Argentine ants (i.e., areas with moisture), and Argentine ants can easily colonize natural riparian plant communities from adjacent residential areas (Talley 2014b, pers. comm.). Argentine ants were found on 13 percent of elderberry shrubs within 6 of 10 Central Valley watersheds surveyed in 2010 (Holyoak and Graves 2010, p. 16; Table 2). Forty-one percent of the total number of Argentine ants observed on elderberry shrubs in these six watersheds were from sites within the Putah Creek watershed (Holyoak and Graves 2010, p. 16), similar to earlier results described for this watershed by Huxel (2000, p. 83). Huxel *et al*. (2003, p. 458) concluded that the isolation of some valley elderberry longhorn beetle mitigation sites in conjunction with the presence of Argentine ant colonies at some of these sites is contributing to a lower success rate for these areas in establishing occupancy of the valley elderberry longhorn beetle (Huxel *et al*. 2003, p. 458).

Successful treatment and control of Argentine ants in urban, agricultural, and natural landscapes has been difficult (Silverman and Brightwell 2008, pp. 234–237). Choe *et al*. (2014, entire) recently described a pheromone-assisted technique that may provide an economically viable control of Argentine ants by maximizing the efficacy of conventional insecticide sprays; however, this technique has not yet been evaluated as an option in natural environments. Given the lack of safe and effective controls, it is likely

that the Argentine ant will continue to expand its range in California, including the Central Valley.

In our 2006 5-year review and in our proposed rule, we identified other potential predators of the valley elderberry longhorn beetle (Service 2006a, p. 13; 77 FR 60260; October 2, 2012). This assessment was based primarily on observations within the American River watershed (American River Parkway), as described in an unpublished report prepared by Klasson *et al*. (2005, pp. 7–8). The European earwig (*Forficula auricularia*) and the western fence lizard (*Sceloporus occidentalis*) were identified as potential predators of larval life stages of the valley elderberry longhorn beetle (Klasson *et al*. 2005, p. 8). The report suggested that high densities of Argentine ants and earwigs at mitigation sites could be subsidizing higher abundances of lizards, creating additional predation pressure on invertebrates in these areas, though this has not been formally evaluated (Klasson *et al*. 2005, p. 8). Predation of larvae by birds (woodpeckers) has been described (Halstead and Oldham 1990, p. 25), but the small prey size and the overall rarity of the species present a low chance of encounter and, therefore, a low mortality risk (Talley *et al*. 2006a, p. 36). However, as noted in our proposed rule, we have no empirical studies with which to evaluate the level of predation threat from these potential predators.

Summary of Factor C

We have no information to indicate that disease is negatively affecting the valley elderberry longhorn beetle population. Invasive Argentine ants have been confirmed at several locations occupied by the valley elderberry longhorn beetle (Holyoak and Graves 2010, p. 16; Table 2). Projections from climate change modeling indicate suitable conditions will occur for Argentine ants to continue to spread in California during the next several decades (Roura-Pascual *et al*. 2004, pp. 2531–2532; Hartley *et al*. 2006, pp. 1073–1077; Roura-Pascual *et al*. 2011, p. 223). Studies show that Argentine ants will attack and consume exposed insect larvae, including valley elderberry longhorn beetle larvae. The predation threat from Argentine ants is likely to increase in the Central Valley as colonies further expand into the species' range unless additional methods of successful control within natural settings become available (e.g., Choe *et al*. 2014, entire). Although additional studies are needed to better characterize the level of predation threat to the valley elderberry longhorn beetle from Argentine ants, the best available data indicates that this invasive species is a predation threat to the valley elderberry longhorn beetle, and it is likely to expand to additional areas within the range of the valley elderberry longhorn beetle in the foreseeable future.

Factor D. The Inadequacy of Existing Regulatory Mechanisms

The Act requires us to examine the inadequacy of existing regulatory mechanisms with respect to extant threats that place the valley elderberry longhorn beetle in danger of becoming either an endangered or threatened species. The regulatory mechanisms affecting the species fall into two general categories: (1) State regulatory mechanisms;

and (2) Federal regulatory mechanisms. In this withdrawal, we incorporate additional detail and new information pertaining to these regulatory mechanisms from what was presented in the proposed rule. We are unaware of any local regulatory mechanisms (e.g., County or City ordinances) that provide protections to the valley elderberry longhorn beetle or its habitat.

State Regulatory Mechanisms

California Endangered Species Act

The California Endangered Species Act (Division 3, Chapter 1.5, section 2050–2069 of the California Fish and Game (CFG) Code) does not provide protections to insects and therefore would not provide protection to the valley elderberry longhorn beetle

The Natural Community Conservation Planning (NCCP) Act

The NCCP program is a cooperative effort between the State of California and numerous private and public partners with the goal of protecting habitats and species. An NCCP program identifies and provides for the regional or area-wide protection of plants, animals, and their habitats, while allowing compatible and appropriate economic activity. The primary objective of the NCCP program is to conserve natural communities at the

ecosystem scale while accommodating compatible land uses (CDFW 2014b). Regional NCCPs provide protection to federally listed species by conserving native habitats upon which the species depend. Many NCCPs are developed in conjunction with Habitat Conservation Plans (HCPs) prepared pursuant to the [Endangered Species] Act.

At present, two regional conservation plans, the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan and the Natomas Basin HCP (revised), are located within the presumed extant occurrences of the valley elderberry longhorn beetle, and have been permitted by the State through the NCCP Program. Another seven regional conservation plans within this range are currently under development. The latter include: Butte County NCCP/HCP, Placer County NCCP/HCP, South Sacramento HCP, Yuba-Sutter County HCP/NCCP, Yolo County HCP/NCCP, Solano County HCP, and the Fresno County HCP. However, although Fresno County initiated planning efforts for developing an HCP in 2007, development of this HCP has been intermittent and it is uncertain whether an application will be submitted to the Service (Thomas 2014, pers. comm.). All but one of these plans (Fresno County HCP) is located in the northern portion of the species' range in the Central Valley. Site-specific or project-level conservation plans that have addressed effects to the valley elderberry longhorn beetle have also been completed within the presumed extant occurrences of the species, though these are generally low-effect HCPs and encompass much smaller areas; most of those are now completed (Thomas 2014, pers. comm.).

In summary, because the valley elderberry longhorn beetle is a covered species in existing NCCPs and anticipated to be a covered species in other NCCPs under development, the species receives protections under the plans, including obligations to continue to implement the conservation plans in their entirety under the terms of their permits. If the valley elderberry longhorn beetle was delisted, habitat protections and coverage under existing NCCPs would remain unless they are amended to remove such protections. However, the species would likely not be included as a covered species in future NCCP/HCPs; thus, the NCCP program may not be an effective regulatory mechanism on its own.

California Environmental Quality Act (CEQA)

CEQA (California Public Resources Code 21000–21177) is the principal statute mandating environmental assessment of projects in California. The purpose of CEQA is to evaluate whether a proposed project may have an adverse effect on the environment and, if so, to determine whether that effect can be reduced or eliminated by pursuing an alternative course of action, or through mitigation. CEQA applies to certain activities of State and local public agencies; a public agency must comply with CEQA when it undertakes an activity defined under CEQA as a "project." A project is defined as an activity undertaken by a public agency or a private activity that requires some discretionary approval (i.e., the agency has the authority to deny or approve the requested permit) from a government agency, and which may cause either a direct physical change in the environment or a reasonably foreseeable indirect change in the environment. Most

proposals for physical development in California are subject to the provisions of CEQA, as are many governmental decisions such as adoption of a general or community plan. Development projects that require a discretionary governmental approval require some level of environmental review under CEQA, unless an exemption applies (California Environmental Resources Evaluation System (CERES) 2014). If significant effects are identified, the lead agency has the option of requiring mitigation through changes in the project or to decide that overriding considerations make mitigation infeasible (Public Resources Code 21000; CEQA Guidelines at California Code of Regulations, Title 14, Division 6, Chapter 3, sections 15000–15387).

Take of a federally listed species, including the valley elderberry longhorn beetle, is considered to be a "significant effect" under CEQA's implementing regulations, thereby creating either a requirement for mitigation or the identification of overriding considerations by the CEQA lead agency. While mitigation for this class of significant effect normally takes the form of an obligation on the part of the project proponent to notify the Service and to take whatever action the Service deems necessary to receive take authorization, the CEQA obligation is an additional regulatory mechanism that frequently provides enhanced protection when the species is listed. However, if the valley elderberry longhorn beetle was delisted, State lead agencies would no longer be subject to making a mandated finding of significant effect, and therefore not otherwise be obligated to provide conservation measures for the beetle through the CEQA process.

California Lake and Streambed Alteration Program

The Lake and Streambed Alteration (LSA) Program (CFG Code sections 1600–1616) provides protection of floodplains through its permitting process. Section 1602 of the CFG Code requires an entity to notify the CDFW of any proposed activity that may substantially modify a river, stream, or lake, to include: substantially diverting or obstructing the natural flow of any river, stream, or lake; substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake; or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. If the CDFW determines that the activity may substantially adversely affect fish and wildlife resources, an LSA Agreement (Agreement) is prepared. In practice, the conditions of the LSA Agreement are negotiated with the applicant by CDFW. Although there can be disagreement on these conditions, CDFW works with applicants to ensure that certain wildlife protections (e.g., bird surveys during nesting season before tree cutting) are included; arbitration is rarely required for this process (Kennedy 2014c, pers. comm.).

We contacted CDFW staff from the agency's North Central region to assess the level and applicability of this program to elderberry habitat within the presumed extant occurrences in this portion of the Central Valley. CDFW indicated that they receive up to 30 applications per year under the LSA program for some areas within the range of the species for activities such as construction or maintenance of bridges and culverts, or for trail improvements (Kennedy, 2014a and 2014b, pers. comm.; Sheya 2014, pers. comm.). Generally, the diameter of the vegetation and amount of riparian vegetation impacted are

used to evaluate the need for an LSA agreement (Kennedy 2014b, pers. comm.). Applicants are asked and expected to contact the Service if elderberry shrubs will be affected (Sheya, 2014, pers. comm.; Kennedy 2014b, pers. comm.). Should the valley elderberry longhorn beetle be delisted, there would likely be little or no heightened concern or scrutiny under the LSA program relative to potential impacts to its habitat (i.e., elderberry shrubs).

Summary of State Regulatory Mechanisms

In summary, CEQA and the LSA Program work synergistically with the Act to provide protections to the species and its habitat. Without the protections provided to the valley elderberry longhorn beetle under the Act (that is, if the species was delisted), these State regulatory mechanisms would not provide an additional level of scrutiny in the evaluation of potential effects to the species or to its habitat from future proposed activities. Under the NCCP Program, the valley elderberry longhorn beetle receives protections under permitted plans, including obligations to continue to implement the conservation plans in their entirety under the terms of their permits. If the valley elderberry longhorn beetle was delisted, habitat protections and coverage under existing NCCPs would remain unless the conservation plans were amended to remove such protections. However, the species would likely not be included as a covered species in future NCCP/HCPs; thus, the NCCP program may not be an effective regulatory mechanism on its own.

Federal Regulatory Mechanisms

National Environmental Policy Act (NEPA)

All Federal agencies are required to adhere to the NEPA of 1970 (42 U.S.C. 4321 *et seq.*) for projects they fund, authorize, or carry out. Prior to implementation of such projects with a Federal nexus, NEPA requires the agency to analyze the project for potential impacts to the human environment, including natural resources. The Council on Environmental Quality's regulations for implementing NEPA state that agencies shall include a discussion on the environmental impacts of the various project alternatives (including the proposed action), any adverse environmental effects that cannot be avoided, and any irreversible or irretrievable commitments of resources involved (40 CFR part 1502). The public notice provisions of NEPA provide an opportunity for the Service and other interested parties to review proposed actions and provide recommendations to the implementing agency. NEPA does not impose substantive environmental obligations on Federal agencies—it merely prohibits an uninformed agency action. However, if an Environmental Impact Statement is prepared for an agency action, the agency must take a "hard look" at the consequences of this action and must consider all potentially significant environmental impacts. The effects on endangered and threatened species is an important element for determining the significance of an impact of an agency action (40 CFR 1508.27). Thus, although NEPA does not itself regulate activities that might affect the valley elderberry longhorn beetle, it does require full evaluation and disclosure of information regarding the effects of

contemplated Federal actions on sensitive species and their habitats. Federal agencies may also include mitigation measures in the final Environmental Impact Statement as a result of the NEPA process that help to conserve the valley elderberry longhorn beetle and its habitat and these may include measures that are different than those required through the Act's section 7 consultation process. If the valley elderberry longhorn beetle were to be delisted, the species and its habitat would receive no more scrutiny than other plant and wildlife resources during the NEPA process and associated analyses of a project's potential impacts to the human environment.

Clean Water Act

Congress passed the Federal Water Pollution Control Act Amendments of 1972 and the CWA of 1977 to provide for the restoration and maintenance of the chemical, physical, and biological integrity of the nation's lakes, streams, and coastal waters. Primary authority for the implementation and enforcement of the CWA rests with the U.S. Environmental Protection Agency and the Corps. Section 404 of the CWA is the principal Federal program that regulates activities affecting the integrity of wetlands. Section 404 prohibits the discharge of dredged or fill material in jurisdictional waters of the United States, unless permitted by the Corps under § 404 (a) (individual permits), 404 (e) (general permits), or unless the discharge is exempt from regulation as designated in § 404 (f). The limits of jurisdictional waters of the United States are determined by: (1) In the absence of adjacent wetlands, jurisdiction extends to the ordinary high-water mark; (2) when adjacent wetlands are present, jurisdiction extends beyond the ordinary high-

water mark to the limit of the adjacent wetlands; or (3) when the water of the United States consists only of wetlands, jurisdiction extends to the limit of the wetland. The CWA may provide protections to elderberry because the taxon is found within seasonal floodplain habitat. However, a site-specific jurisdictional delineation will be required to determine whether a section 404 CWA permit from the Corps would be required for proposed discharge of fill material in these areas.

In addition to the measures authorized before 1972, the CWA implements a variety of programs, including: Federal effluent limitations and State water quality standards, permits for the discharge of pollutants and dredged and fill materials into navigable waters, and enforcement mechanisms. These programs may provide additional protections of water quality within the floodplains and riparian vegetation in which the valley elderberry longhorn beetle occurs. Without the protections afforded by the Act, if a proposed project area included the valley elderberry longhorn beetle or elderberry shrubs, there would be no additional level of scrutiny of the project's effects beyond that provided to other riparian vegetation and floodplain resources.

Clean Air Act

With respect to regulatory mechanisms that address climate change, there are no regulatory mechanisms in place at the national or international levels that directly and effectively address the ongoing or projected effects of climate change on the valley elderberry longhorn beetle. In the United States, on December 15, 2009, the

Environmental Protection Agency (EPA) published in the **Federal Register** (74 FR 66496) a rule titled: "Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act." In this rule, the EPA Administrator found that the current and projected concentrations of the six long-lived and directly emitted GHGs—carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride—in the atmosphere threaten the public health and welfare of current and future generations; and that the combined emissions of these GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare (74 FR 66496). In effect, the EPA has concluded that the GHGs linked to climate change are pollutants, whose emissions can now be subject to the Clean Air Act (42 U.S.C. 7401 *et seq.*) (74 FR 66496; December 15, 2009). As part of its Clean Power Plan proposal, EPA recently published proposed regulations to limit GHG emissions for power plants (79 FR 34830, June 18, 2014), with a 120-day comment period. However, these regulations have not been finalized.

Endangered Species Act of 1973, as amended (Act)

Upon its listing as threatened, the valley elderberry longhorn beetle benefited from the protections of the Act, which include the prohibition against take and the requirement for interagency consultation for Federal actions that may affect the species. Section 9 of the Act and Federal regulations prohibit the take of endangered and threatened species without special exemption. The Act defines "take" as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any

such conduct (16 U.S.C. 1532(19)). Our regulations define "harm" to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering (50 CFR 17.3). Our regulations also define "harass" as intentional or negligent actions that create the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavior patterns, which include, but are not limited to, breeding, feeding, or sheltering (50 CFR 17.3). Section 7(a)(1) of the Act requires all Federal agencies to utilize their authorities in furtherance of the purposes of the Act by carrying out programs for the conservation of endangered species and threatened species. Section 7(a)(2) of the Act requires Federal agencies to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species or destroy or adversely modify their critical habitat. As an example, the U.S. Forest Service consults with the Service on effects of proposed activities (e.g., vegetation management, grazing, invasive species removal, recreational trail maintenance) to elderberry habitat found within the Sierra National Forest; however, most of these activities are designed so as to avoid elderberry shrubs, and are therefore found to have no effect to the valley elderberry longhorn beetle (Moore 2012, pers. comm.).

Section 6 of the Act authorizes us to enter into cooperative conservation agreements with States and to allocate funds for conservation programs to benefit endangered or threatened species, which provides another potential benefit. Neither

section 6 of the Act nor Service policy gives higher priority to endangered species over threatened species for conservation funding.

Thus, listing the valley elderberry longhorn beetle under the Act provided a variety of protections, including the prohibition against take and the conservation mandates of section 7 for all Federal agencies. Because the Service has regulations that prohibit take of all threatened wildlife species (50 CFR 17.31(a)), unless modified by a special rule issued under section 4(d) of the Act (50 CFR 17.31(c)), the regulatory protections of the Act are largely the same for wildlife species listed as endangered and as threatened; thus, the protections provided by the Act will remain in place for the duration of time that the valley elderberry longhorn beetle remains on the Federal List of Endangered or Threatened Wildlife.

National Wildlife Refuge System

The National Wildlife Refuge System Improvement Act of 1997 (Pub. L. 105–57) (which amended the National Wildlife Refuge System Administration Act of 1966 (16 U.S.C. 668dd et seq.)), expressly states that wildlife conservation is the priority of National Wildlife Refuge (NWR) System lands and that the Secretary shall ensure that the biological integrity, diversity, and environmental health of refuge lands are maintained. Each NWR is managed to fulfill the specific purposes for which the refuge was established and the NWR System mission; thus, the first priority of each refuge is to conserve, manage, and, if needed, restore fish and wildlife populations and habitats

according to its purpose. This legislation requires the development of a Comprehensive Conservation Plan (CCP) for all NWR units (outside of Alaska). A CCP includes management actions that can provide conservation benefits to federally listed and non-federally listed fish and wildlife. The Sacramento River NWR, San Joaquin River NWR, the Merced NWR, and nearly all of the lands within the San Luis NWR are found within the presumed extant occurrences of the valley elderberry longhorn beetle. NWR efforts to conserve the valley elderberry longhorn beetle and its habitat are summarized in the following paragraphs.

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, and contains 30 different units, each with its own specific projects and management needs (Service 2005a, p. 12). Wildlife and habitat management goals for the Sacramento River NWR include preparing and implementing restoration plans to restore riparian vegetation (including elderberry plants), and maintaining existing and restored riparian vegetation (Service 2005a, pp. 139–140; Service 2005b, p. 1, Appendix 1). The valley elderberry longhorn beetle is the only terrestrial endemic organism found on the Sacramento River NWR, and elderberry provides important habitat for other taxa found there, especially other insects, migratory birds, and the western fence lizard (Silveira 2014a, pers. comm.). Management for the valley elderberry longhorn beetle on the Sacramento River NWR is implemented through the management actions implemented for elderberry habitat found throughout the refuge

in riparian forests as well as with plantings at restoration sites in mixed-riparian forest and elderberry savanna habitats (Service 2005a, p. 118).

Occurrences of valley elderberry longhorn beetle exit holes have been reported within the Sacramento River NWR in the CNDDB (CNDDB 2013, entire) and from other sources (e.g., Service 2005a, p. 92). In 2004, River Partners (2004, entire) documented the successful colonization of the valley elderberry longhorn beetle as defined by observations of exit holes in planted elderberries within five different units of the refuge. At that time, the percent of elderberry shrubs with exit holes ranged from 0.6 to 7.9 (average per refuge unit) (River Partners 2004, pp. 2–3). Since 1993, over 100,000 elderberry plants have been planted within 13 units of the Sacramento River NWR with an additional 14,270 plantings in another 9 units (since 1999) (Silveira 2014a and 2014b, pers. comm.). Mean survival rates of elderberry plants range from 42 percent to 100 percent, with a combined average for all sites of about 90 percent (Silveira 2014a and 2014b, pers. comm.). The long-term survival of elderberry at the refuge's restoration sites depends on several factors including soil type and profile characteristics, as well as the type of vegetation planted with elderberry; that is, elderberry shrubs are found to be more persistent in valley oak woodland and open savanna habitats and much less persistent in closed-canopy mixed riparian forest (Silveira 2014a, pers. comm.).

In 2007 and 2008, Gilbart (2009, entire) surveyed 432 planted elderberry shrubs within 8 units of the Sacramento River NWR for occupancy (new and old exit holes) of the valley elderberry longhorn beetle. The study found that 21 percent of all shrubs

searched had new holes, but only 33 percent of shrubs with old exit holes showed sustained or current occupation (i.e., presence of new exit holes) (Gilbart 2009, p. 40). Finally, although Golet *et al*. (2013, pp. 9, 21) reported an increase in occupancy of the valley elderberry longhorn beetle through colonization at restoration sites on the refuge (see River Partners 2004, entire), they found that the "importance value" of elderberry, or the sum of relative density plus relative basal area, had actually declined as restoration sites matured, suggesting that long-term availability of suitable elderberry habitat at these sites is uncertain.

The Sacramento River NWR has also implemented a 100-ft (30.5-m) buffer between elderberry shrubs at its restoration sites and private orchards, levees, or roadways to reduce the potential for colonization on adjacent lands (Service 2005b, p. 34). This boundary was also designed to ensure that agricultural pesticide drift from neighboring private orchards and facility maintenance operations will not affect valley elderberry longhorn beetle habitat within restoration sites or adjacent landowner activities (Service 2005b, p. R-15, Appendix 2). Monitoring and evaluation of the use of restored habitat by targeted federally listed species, including the valley elderberry longhorn beetle, are also established objectives for the refuge (Service 2005a, p. 146; Service 2005b, p. 5, Appendix 1). End-of-season monitoring of elderberry restoration sites are conducted on the Sacramento River NWR by River Partners or The Nature Conservancy and results are provided in annual restoration reports prepared for the refuge (Silveira 2014a and 2014b, pers. comm.).

The San Joaquin River NWR is located within the San Joaquin Valley of the Central Valley of California and was established in 1987 to primarily protect and manage wintering habitat for the Aleutian Canada goose (*Branta canadensis leucopareia*), a former federally endangered species (Service 2006b, p. 2). The focus of the San Joaquin River NWR has since expanded to include other endangered or threatened species, migratory birds, wildlife dependent on wetlands and riparian floodplain habitat, and restoration of habitat and ecological processes (Service 2006b, p. 2). The San Joaquin River NWR currently provides habitat for both wetland- and upland-dependent wildlife species of California's Central Valley (Service 2006b, p. 1).

Elderberry shrubs are relatively abundant on the San Joaquin River NWR east of the San Joaquin River, but are limited west of the river (Service 2006b, p. 171). However, there have been no comprehensive surveys to document occupancy of the valley elderberry longhorn beetle (Service 2006b, p. 51). The CNDDB (CNDDB 2013) includes one element occurrence (EO 157) where exit holes were observed in surveys in May and June of 1984; no adults were seen.

Management objectives identified in the CCP for the San Joaquin River NWR include surveys for the valley elderberry longhorn beetle and, if necessary, a management plan would be prepared for the species and its habitat (Service 2006b, p. 69). However, the San Joaquin NWR has already implemented conservation actions for the valley elderberry longhorn beetle, including planting of elderberry shrubs on the west side of the refuge. A large-scale (800-ac (324-ha)) restoration effort, including several fields of

elderberry plantings, was initiated on the San Joaquin River NWR in 2002 (River Partners 2007, pp. 4, 57). In 2006, approximately 235 ac (95 ha) or 185 individual elderberry plants (planted in 2003) were surveyed, and surveyors found that many of these elderberry plants died as a result of prolonged flooding during the spring and early summer of 2006 (River Partners 2007, pp. v, 4). Subsequently, additional elderberry shrubs were planted on about 120 ac (49 ha) at a higher elevation (77 FR 60256; October 2, 2012). As reported in our proposed rule, much of the San Joaquin River NWR is at an elevation such that during a wet winter and spring, flooding can extend from 1 to 6 months over most of the refuge, which is generally too long of an inundation time for elderberry to survive (Griggs 2007, pers. comm.). However, the non-maintained areas of the levee system within the refuge are also being planted with elderberry (Griggs 2007, pers. comm.).

There are no records of exit hole observations or adult valley elderberry longhorn beetles in either the San Luis NWR or Merced NWR (CNDDB 2013, entire; Service 2014, GIS Analysis; Woolington 2014, pers. comm.). Neither the San Luis NWR nor the Merced NWR has completed a final CCP. However, a total of 1,000 elderberry plants have been planted at both refuges, and these efforts are expected to continue in the future (Woolington 2014, pers. comm.).

Natural Resources Conservation Service

As noted in our proposed rule, grants and loan programs implemented through the Natural Resources Conservation Service (NRCS) and the Service (e.g., Partners for Fish and Wildlife) can provide opportunities for habitat enhancement of valley elderberry longhorn beetle in the Central Valley. Under its Wetland Reserve Program (WRP) and Emergency Watershed Protection Program (EWPP), the NRCS reported in 2011 that 1,671 ac (676 ha) in seven counties in the Central Valley support elderberry and associated riparian plants of elderberry habitat within either WRP perpetual easements or EWPP Flood Plain easements (Moore 2011, pers. comm.). Although these programs are not regulatory mechanisms because their implementation is subject to funding availability, they are important conservation programs that benefit both the environment and agricultural producers in the Central Valley.

The NRCS also provides financial assistance to farmers and ranchers for planting elderberry plants, including hedgerow plantings. Since 2005, the NRCS has funded 220 hedgerow projects, creating 38 mi (61 km) of hedgerows; an additional 100 projects encompassing 29 mi (47 km) of hedgerows were expected to be completed by 2013 (Moore 2011, pers. comm.). However, not all of these projects provide for planting of elderberry. Only those hedgerow projects located in areas covered by valley elderberry longhorn beetle Safe Harbor Agreements (San Joaquin and Yolo Counties) are consistently planted with elderberry shrubs (Moore 2011, pers. comm.). We have no information on the occupancy of the valley elderberry longhorn beetle within WRP perpetual or EWPP Flood Plain easements or hedgerow plantings.

Sikes Act and other Department of Defense Programs

The Sikes Act (16 U.S.C. 670a–670f, as amended) directs the Secretary of Defense, in cooperation with the Service and State fish and wildlife agencies, to carry out a program for the conservation and rehabilitation of natural resources on military installations. The Sikes Act Improvement Act of 1997 (P.L. 105–85) broadened the scope of military natural resources programs, integrated natural resources programs with operations and training, embraced the tenets of conservation biology, invited public review, strengthened funding for conservation activities on military lands, and required the development and implementation of an Integrated Natural Resources Management Plan (INRMP) for relevant installations, which are reviewed every 5 years.

INRMPs incorporate, to the maximum extent practicable, ecosystem management principles, provide for the management of natural resources (including fish, wildlife, and plants), allow multipurpose uses of resources, and provide public access necessary and appropriate for those uses without a net loss in the capability of an installation to support its military mission. Although INRMP implementation is technically not a regulatory mechanism because its implementation is subject to funding availability, it is an important guidance document that helps to integrate natural resource protection with military readiness and training. In addition to technical assistance that the Service provides to the military, the Service can enter into interagency agreements with installations to help implement an INRMP. These INRMP implementation projects can

include wildlife and habitat assessments and surveys, fish stocking, exotic species control, and hunting and fishing program management.

Beale Air Force Base (Beale AFB) is located in Yuba County, in the northeastern part of the Sacramento Valley, approximately 13 mi (21 km) east of Marysville and 40 mi (64 km) north of Sacramento. Beale AFB is located within an ecological and geographic transition zone between the flat agricultural lands of the Sacramento Valley to the west and the foothills of the western slope of the Sierra Nevada to the east; three tributaries to the Bear River (Reeds, Hutchinson, and Dry Creeks) run through the base (DOD 2011, p. 33). Several areas of elderberry shrubs are found on Beale AFB, including shrubs planted within conservation areas for compensation and habitat restoration purposes (Capra 2011, pers. comm.).

In 2011, an updated INRMP was prepared, which underwent an annual review in 2013 by the installation in coordination with the Service and CDFW (DOD 2011, entire). The Beale AFB INRMP Work Plan includes goals and objectives to maintain or increase populations of special status species and improve their habitat conditions (DOD 2011, p. 164). Specifically, the Work Plan includes monitoring of the valley elderberry longhorn beetle in compliance with a Special Area Management Plan (SAMP) Habitat Restoration, Monitoring and Management Program (HRMMP) (DOD 2011, p. 165). The SAMP establishes a framework for habitat conservation, compensation, and watershed management and designates areas on the base that are, or will be, protected and preserved (DOD 2011, p. 23). A programmatic biological opinion was developed with the Service

to establish a predictable process for federally listed species consultation and compensation on the base, and one in which future routine consultations would be shortened (DOD 2011, p. 27). In October 2012, the Service completed a formal consultation for effects to the valley elderberry longhorn beetle related to activities implemented under the SAMP (Service 2012, entire). The monitoring program established within the SAMP HRMMP includes sampling a random selection of 25 percent of mapped elderberry shrubs every 2 years and a notation of the physical condition of the monitored shrubs and the presence or absence of exit holes (DOD 2011, page A9-24).

As described in the INRMP, approximately 697 elderberry shrub locations were identified as occurring on Beale AFB, and the largest shrubs were surveyed in 2005 to determine the potential presence of valley elderberry longhorn beetle on base (DOD 2011, A2-29). Exit holes were found in 25 percent (13 of 51) of shrubs sampled in a riparian preservation area, but no adult beetles were observed (DOD 2011, pp. A2-29–A2-30). Exit holes were also found in 2012 in elderberry habitat at another location on the base (DOD 2014). Since fiscal year 1996, the base has received $73,000 to $400,000 per year for Habitat Conservation Management Plan (HCMP) implementation and monitoring (DOD 2011, p. A2-44). Based on this funding history, it is likely that HCMP projects will continue to be implemented in the future as funds are approved, and the INRMP/HCMP continues to provide a conservation benefit to the valley elderberry longhorn beetle (DOD 2011, p. A2-44). Without the protections provided to the species and its habitat under the Act (that is, if the valley elderberry longhorn beetle was

delisted), there would be no regulatory incentive for the INRMP and HCMP to continue to include important provisions (e.g., monitoring) that provide conservation benefits to the species, beyond that provided under a larger integrated natural resource management strategy at Beale AFB.

Summary of Factor D

State regulatory mechanisms provide a limited amount of protection against current threats to valley elderberry longhorn beetle. The requirements of CEQA and the LSA program may provide limited protections for the valley elderberry longhorn beetle and its host plant. However, without the protections provided to the valley elderberry longhorn beetle under the Act (that is, if the species was delisted), these State regulatory mechanisms would not provide an additional level of conservation benefit to the species or to its habitat. The NCCP program can provide important protections through implementation of management actions and conservation measures when the valley elderberry longhorn beetle and its host plant are incorporated in regional or project-level conservation plans, including obligations to continue to implement the conservation plans in their entirety under the terms of their permits. If the valley elderberry longhorn beetle was delisted, habitat protections and coverage under existing NCCPs would remain unless the conservation plans were amended to remove such protections. However, the species would likely not be included as a covered species in future NCCP/HCPs; thus, the NCCP program may not be an effective regulatory mechanism on its own.

A variety of Federal regulatory mechanisms exist throughout the range of the valley elderberry longhorn beetle. NEPA does not itself regulate activities that might affect the valley elderberry longhorn beetle, but it does require full evaluation and disclosure of information regarding the effects of contemplated Federal actions on sensitive species and their habitats. The CWA may provide protections to elderberry because the taxon is found within seasonal floodplain habitat. However, a site-specific jurisdictional delineation will be required to determine whether a section 404 CWA permit from the Corps would be required for actions proposed for these areas. While the Clean Air Act gives the EPA authority to limit GHGs linked to climate change, the regulations that the EPA has proposed regarding GHG emissions from power plants have yet to be finalized and thus cannot be considered existing regulatory mechanisms. At this time, we are not aware of any regulatory mechanisms in place at the international or national levels that address the ongoing or projected effects of climate change on the valley elderberry longhorn beetle.

We expect management actions currently being implemented and, depending on funding, planned for the future for the Sacramento River NWR and San Joaquin River NWR will continue to provide important conservation benefits to the valley elderberry longhorn beetle, although occupancy (based on exit holes) for these locations has been very low. In addition, comprehensive surveys for adults or exit holes have not been conducted on refuge lands or at easements established under NRCS programs. The Department of Defense also provides some protections to valley elderberry longhorn

beetle and its habitat in the Central Valley at Beale AFB through implementation of its INRMP under the Sikes Act.

Overall, although regulatory mechanisms are in place and provide some protection to the valley elderberry longhorn beetle and its habitat, absent the protections of the Act (e.g., section 7 and section 10(a)(1)(B)), these mechanisms would not provide adequate protection from the threats currently acting on the species.

Factor E. Other Natural or Manmade Factors Affecting Its Continued Existence

Natural and manmade factors affecting the valley elderberry longhorn beetle evaluated in this section include some effects related to climate change (related to temperature changes) and pesticides that may impact the survivorship or reproductive success of the species. See additional discussion on potential effects of climate change above under *Factor A*. In the proposed rule, we presented a general discussion of pesticide use in the Central Valley, but stated that we did not have information that confirmed pesticide use was a significant threat to the valley elderberry longhorn beetle (77 FR 60262–60263; October 2, 2012). In this withdrawal, we present more recent information regarding pesticide usage trends in the Central Valley and include a detailed discussion of effects of one class of pesticides to insects relative to their potential effects to the valley elderberry longhorn beetle. Additionally, we provide an updated summary discussion of small population size as a potential threat, as was discussed in the proposed rule (77 FR 60263; October 2, 2012).

In this revised *Factor E* analysis, we do not include a discussion of loss of populations resulting from habitat fragmentation as described in the proposed rule (77 FR 60264; October 2, 2012). We indicated in the proposed rule that we were not aware of any information that would support robust conclusions regarding the extent of isolation of valley elderberry longhorn beetle populations at distances greater than a presumed recolonization distance of 25 mi (40 km) (77 FR 60264; October 2, 2012). At present, we have no population trends for the valley elderberry longhorn beetle to draw conclusions regarding loss of specific populations within the range of the species, and we are unaware of any viable tools to evaluate potential fragmentation of elderberry habitat in order for us to evaluate this potential threat.

Temperature and other Effects of Climate Change

As described above (see *Factor A*), increased temperatures are projected for the current range of the valley elderberry longhorn beetle. At this time we do not know what temperature levels (in terms of either isolated heat spikes or extended periods of high heat) are lethal for the species, or whether and how such changes may affect survivorship or reproductive success. We also do not have information to assess the near- or long-term adaptive capacity of this species in relation to climate change effects. Specifically in the near term we do not have information about its ability to make behavioral or physiological changes that will allow individuals to persist as temperatures increase within its current range. In this regard, we also are concerned by the relatively limited

dispersal ability of the species, which could limit its ability to undertake range shifts in response to changing climate conditions. The range shifts in latitude and elevation reported for some other species of longhorn beetles in Great Britain (Hickling *et al*. 2006, pp. 451–453) are of interest, but we do not know whether this is applicable to the valley elderberry longhorn beetle and the habitat fragmentation and other conditions it faces. Also, at this time we have no information on the possibility of genetic (evolutionary) adaptation that could influence population- and species-level persistence over generations in the face of changing temperatures or other physical effects of a changing climate.

Pesticides

In our 2006 5-year review and our 2012 proposed rule, we evaluated pesticide use in the Central Valley as a potential threat to the valley elderberry longhorn beetle (Service 2006a, pp. 18–19; 77 FR 60262; October 2, 2012). As noted in our proposed rule, there have been reports of potential effects to elderberry shrubs (yellowing of leaves) adjacent to cultivated fields recently treated by aerial crop dusting (Barr 1991, p. 27). We concluded in our proposed rule that we lacked information confirming that pesticide use was a significant threat to the valley elderberry longhorn beetle (77 FR 60263; October 2, 2012). In this withdrawal, we provide an updated and more detailed discussion of this potential threat based on peer reviewer comments and species' experts (e.g., Talley *et al*. (2006b, p. 44)) conclusions that pesticide impacts to the species and its habitat are likely given the level of pesticide use (both urban and agricultural uses) in parts of the Central Valley and the proximity of agriculture to riparian vegetation.

Pesticide use in California varies from year to year and is dependent on a number of factors, with weather conditions being particularly important (California Department of Pesticide Regulation (CDPR) 2014, p. 70). Short time periods (3 to 5 years) can suggest either an upward or downward trend in pesticide use; however, regression analyses of usage from 1998 to 2012 have not revealed a significant trend in either direction (CDPR 2014, p. 17). Pesticide use (pounds of active ingredient) in the lower portion of the San Joaquin Valley) are among the highest in the State (based on county reports) (CDPR 2014, pp. 12–13), though with the exception of San Joaquin County, much of this portion of the Central Valley is considered to be outside the area defined by the presumed extant occurrences of the valley elderberry longhorn beetle. However, in the northern portion of the range of the valley elderberry longhorn beetle (Tehama County south to Sacramento County), pesticide use ranks relatively high (in the top 20) for several counties (CDPR 2014, pp. 12–13). Based on the amount applied, the most-used pesticide types are combination fungicide/insecticides (mostly sulfur), fumigants, and insecticides (CDPR 2014, p. 66). Based on cumulative area treated, the most-used types are insecticides, herbicides, and fungicides (CDPR 2014, p. 66).

Neonicotinoid insecticides such as imidacloprid are used extensively for some crops in California (e.g., wine grapes; CDPR 2014, p. 76). They are also widely used as seed treatments (Goulson 2013, p. 978). The use of imidacloprid on agricultural land in the Central Valley of California was estimated at over 0.24 pounds per square mile in 2011 (USGS 2014); CDPR reported a total of 297,384 pounds of imidacloprid were

applied in California in 2012, encompassing 64,209 agricultural applications (CDPR 2014, pp. 413–416).

Neonicotinoids are particularly toxic to insects in small quantities (Goulson 2013, p. 977). Experimental studies have also found important sublethal effects to Asian longhorned beetles in response to imidacloprid, including a reduction in the number of viable eggs (Ugine *et al*. 2011, p. 1948) and a decrease in food consumption (Russell *et al*. 2010, p. 308). A lack of sufficient locomotor control is suspected as the cause of some of the changed behaviors, rather than the palatability of food (Ugine *et al*. 2011, p. 1,948). Concerns regarding the environmental risks of neonicotinoid insecticides to honeybees have prompted recent efforts to provide additional control of their usage (e.g., application restrictions; EPA 2013, entire).

Studies of exposure to neonicotinoids have also shown differential effects to the behaviors and community dynamics of ants (Barbieri *et al*. 2013, entire). Interspecific aggressive behavior and colony fitness differences after exposure to imidacloprid were observed for the invasive Argentine ant and a native ant (*Monomorium antarcticum*) (Barbieri *et al*. 2013, p. 5). The study results suggest that in areas in which a native ant species has been previously exposed to neonicotinoid insecticides, the Argentine ant could have an advantage in securing food resources and overall survival (Barbieri *et al*. 2013, p. 5). Altered behaviors in ant populations due to pesticide exposure may be an important contributing factor to the predation threat of Argentine ants for those areas

where occupancy of the valley elderberry longhorn beetle has been shown to co-occur with this invasive ant. However, these effects have not been formally evaluated.

The timing of pesticide applications are also likely to coincide with vulnerable life stages (adult activity, exposure of eggs and larvae) of the valley elderberry longhorn beetle (Talley *et al*. 2006b, p. 43). However, we are unaware of any specific studies of either exposure, or responses to exposure, to pesticides for the valley elderberry longhorn beetle.

We evaluated information that indicates pesticides are likely present in areas around and adjacent to valley elderberry longhorn beetle habitat, including areas occupied by the species, which creates the potential for exposure of the beetle and its habitat to harmful pesticides through unintended drift from applications, as well as potential secondary effects to insect communities in riparian vegetation that may create an advantage for potential predators (i.e., Argentine ants) of the valley elderberry longhorn beetle. Based on our evaluation presented in the proposed rule and updated information presented above, the best available scientific and commercial information indicates potential impacts from pesticides to the valley elderberry longhorn beetle and its habitat; however, further studies are needed to characterize the magnitude or impact of pesticides to the species both in localized areas as well as across the species' range.

Small Population Size

In our proposed rule, we concluded that the best available information did not indicate small population size was a significant concern at that time or in the future (77 FR 60263; October 2, 2012). We provide in this withdrawal a reiteration of this potential threat without making inferences based on incomplete data regarding population size, locations of populations, and population trends.

Although we do not have data from which to draw conclusions regarding the population size of the valley elderberry longhorn beetle, we nonetheless consider whether rarity might pose a potential threat to the species. While small populations are generally at greater risk of extirpation from normal population fluctuations due to 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 species may warrant listing. 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 has always had small population sizes or has always been rare, yet continues to survive (as is the case for the valley elderberry longhorn beetle; see **Background** section) could be well-equipped to continue to exist into the future.

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. Although low genetic variability and reduced fitness from inbreeding could occur, at this time we have no evidence of genetic problems with the valley elderberry longhorn beetle. The valley elderberry longhorn beetle is known to be endemic to the Central Valley since at least 1921 (Fisher 1921, p. 207), and has historically survived fires, drought, and other stochastic events. We have no data to indicate that rarity or small population size, in and of themselves, pose a threat to the species at this time or in the future.

Summary of Factor E

Based on the best scientific information available, we do not know whether increased temperature and other projected effects associated with a changing climate in the coming decades (per projections for the 2060s) will exceed lethal levels or influence the survivorship and reproductive success of the valley elderberry longhorn beetle. We also do not know what adaptive capacity the species has, which will influence its response to increased temperature and other physical changes in climate.

The best available scientific information indicates potential impacts from pesticides to the valley elderberry longhorn beetle and its habitat; however, further studies are needed to characterize the magnitude or impact of pesticides to the species both in localized areas as well as across the species' range. Pesticide use in the Central Valley remains high and could increase due to climate change effects (e.g., warmer

temperatures) that may enhance the pathogenicity of crop pests for agricultural fields that are commonly found adjacent to remnant riparian vegetation.

We do not believe that small population size constitutes a threat to the valley elderberry beetle throughout all or a significant portion of its range currently or in the future.

Cumulative Effects

Threats can work in concert with one another to cumulatively create conditions that will impact the valley elderberry longhorn beetle beyond the scope of each individual threat. Some of the threats discussed in the proposed rule and reevaluated in this document are expected to work in concert with one another to cumulatively create situations that are likely currently impacting and likely will impact the valley elderberry longhorn beetle or its habitat beyond the scope of the individual threats that we have already analyzed.

For some species, vulnerabilities to climate change effects have been found to be dependent on interactions between life-history traits and spatial characteristics (Pearson *et al*. 2014, p. 218), and it is likely that this is also true for other taxa, including the valley elderberry longhorn beetle. Climate change effects (e.g., warmer temperatures, increase in drought events, and changes in precipitation patterns) are likely to increase the extinction risk of the valley elderberry longhorn beetle and can also affect its host plant,

e.g., by creating conditions that favor the expansion of invasive species in the Central Valley, or by outright reduction in host plants if the effects of climate change are more than elderberries can tolerate. An increase in temperature expected before the end of this century will also take place in concert with changes in land use and other environmental factors such as pesticide use, altered habitat due to invasive plant species, predation threats, and secondary effects of climate change (altered hydrologic conditions). Although distributional shifts of the valley elderberry longhorn beetle (e.g., in both elevation and latitude) might be observed in the future given the alteration of climate, especially with increases in temperature, the limited remaining fragmented habitat and relatively limited dispersal ability of the species may restrict any such range shift. Data from long-term population trends of the beetle and its habitat will be needed to evaluate these types of potential cumulative effects.

Determination

As required by the Act, we considered the five factors in assessing whether the valley elderberry longhorn beetle meets the definition of an endangered or threatened species. We examined the best scientific and commercial information available regarding the past, present, and foreseeable future threats faced by the species. Based on our review of the best available scientific and commercial information, we find that the current and future threats are of sufficient imminence, intensity, or magnitude to indicate that the valley elderberry longhorn beetle remains likely to become endangered within the foreseeable future throughout all of its range. Therefore, the valley elderberry longhorn

beetle currently meets the definition of a threatened species, and we are withdrawing the proposed rule to delist the valley elderberry longhorn beetle. Our rationale for this finding is outlined below.

We presented valley elderberry longhorn beetle occurrence (adult beetle and exit hole data) and distribution information in the proposed rule (77 FR 60238; October 2, 2012) that we determined to be the best available scientific and commercial information at that time. However, based on the peer review and public comments received on the proposed rule, including new information received, we reevaluated the beetle's biological information and the five-factor analysis prepared for the proposed rule to determine where clarifications, corrections, or revisions were necessary. In this rule, we provide a revised description of the location of observations of adult valley elderberry longhorn beetles or exit holes and present an updated distribution map based on surveys conducted since 1997. Our reanalysis of survey reports and published studies (including a reexamination of the best available data) helped us assess the relative quality of the species' occurrence (e.g., CNDDB records), location, and occupancy data presented in the proposed rule. As noted above (see **Background** section), the population structure for the valley elderberry longhorn beetle has been characterized as patchy-dynamic; that is, one controlled by both broad-scale factors associated with elderberry shrubs (e.g., shrub age) and riparian-associated environmental variables, which have patch, gradient, and hierarchical features (e.g., relative elevation) (Talley 2007, p. 1486). The valley elderberry longhorn beetle remains localized in its distribution, with limited dispersal

ability, and we estimate it occupies less than 25 percent of the remaining elderberry habitat found within fragmented riparian areas.

Our reanalysis of information in our files and new information received during the open comment periods changed our evaluation of the threats to the species. In this withdrawal we conclude that the valley elderberry longhorn beetle continues to be threatened by habitat loss or degradation (*Factor A*) and predation (*Factor C*) throughout all of its range. Additional environmental factors (e.g., additional habitat loss) and other stressors (e.g., effects related to pesticide use, competition to its host plant from invasive species) are likely to influence the species' distribution and likelihood of extinction in the foreseeable future.

Despite the fact that we are not delisting the valley elderberry longhorn beetle, our reanalysis of information in our files and new information received has helped us better define our management actions directed at conserving the species, such as: (1) Improve our survey techniques to better define its distribution and abundance; (2) implement data management practices to better evaluate conservation measures being implemented at mitigation and restoration sites; (3) refine our evaluation of potential threats to the species (e.g., those related to climate change effects); (4) continue to promote restoration of riparian habitat; and (5) work with our partners to identify and implement key research needs to improve our understanding of the species.

The valley elderberry longhorn beetle remains likely to become an endangered species in the foreseeable future because it is a habitat specialist, with limited dispersal ability and a short adult life span, and it possesses rarity traits such as low local numbers within a population structure that has become fragmented within its historical range, and continues to be fragmented further by ongoing impacts to its habitat.

Although evidence of occupancy (primarily observations of exit holes) for the species has been documented in additional locations than those recorded at the time of listing in 1980 (as discussed in the proposed rule), we believe this is the result of limited data available at the time of listing, combined with subsequent surveys that have better defined the presumed historical range of the valley elderberry longhorn beetle. Following our reexamination of the original surveyor data sets (as described in the *Population Distributio*n section above), new occurrence information received (i.e., Arnold 2014a, pers. comm., 2014; DOD 2014; River Partners 2011), an examination of the quality of valley elderberry longhorn beetle records contained in the CNDDB, and an evaluation of occupancy estimates based on several surveys (Collinge *et al*. 2001, p. 111; Talley *et al*. 2007, pp. 25–26; Gilbart 2009, p. 40; Holyoak and Graves, 2010, entire; Holyoak and Graves 2010, Appendix 1), we conclude there are extant occurrences of the valley elderberry longhorn beetle at 36 geographical locations in the Central Valley. However, these locations are based in large part on observations of exit holes, which may not be an accurate depiction of occupancy (see *Life History* discussion in **Background** section). When considering data of adult male occurrences (which may be a more accurate depiction of occupancy), only 25 percent (9 of the 36 locations) of these records,

within 4 hydrologic units, represent observations of adult male beetles recorded since 1997. In making our determination, we also assessed the amount and spatial arrangement of mapped elderberry habitat within the Central Valley. However, we acknowledge that there are no current estimates of population size or trends in population numbers for the valley elderberry longhorn beetle.

Restoration and mitigation efforts have provided elderberry habitat for the valley elderberry longhorn beetle, but very little comprehensive monitoring has been conducted to evaluate the success of these sites, both in terms of habitat of value to the species and occupancy of these habitats. Comprehensive monitoring at restoration and mitigation sites as well as natural sites remaining in the Central Valley is needed in order to produce definitive population trends of occupancy for this species. A second year of trial surveys for the valley elderberry longhorn beetle using pheromone attractants is currently under way (Sanchez 2014, pers. comm.) to further evaluate this method to assess the status of this species within its presumed range. This survey technique could also provide valuable information on populations of both elderberry longhorn beetles (*Desmocerus californicus dimorphus, D. californicus californicus*).

As described in our *Factor D* analysis, conservation plans and programs are currently in place or planned for some portions of the valley elderberry longhorn beetle's range. State regulatory mechanisms, such as CEQA and the LSA, may provide limited protections for the species' host plant as they work synergistically with the Act to provide protections to the species and its habitat.

Although Federal regulatory mechanisms other than the Act can offer protection to the valley elderberry longhorn beetle in small areas of the species' range, we believe that the Act represents the primary regulatory mechanism for conservation of the valley elderberry longhorn beetle. If the valley elderberry longhorn beetle were to be delisted, it would not receive the substantial protections provided to the species and its habitat under the Act.

Based on our review of the best available scientific and commercial data, we conclude that the valley elderberry longhorn beetle currently meets the definition of a threatened species because current and future threats including present and continued loss or modification of its habitat, predation, and threats related to the effects of climate change are of sufficient imminence, intensity, or magnitude to indicate that the valley elderberry longhorn beetle is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

Significant Portion of the Range

In determining whether a species is endangered or threatened in a significant portion of its range, we first identify any portions of the range of the species that warrant further consideration. The range of a species can theoretically be divided into portions an infinite number of ways. However, there is no purpose to analyzing portions of the range that are not reasonably likely to be both: (1) Significant, and (2) 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. In practice, a key part of this analysis 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 applies only to portions of the species' range that are not significant, such portions will not warrant further consideration.

If we identify portions that warrant further consideration, we then determine whether the species is endangered or threatened in these portions of its range. Depending on the biology of the species, its range, and the threats it faces, the Service may address either the significance question or the status question first. Thus, if the Service considers significance first and determines that a portion of the range is not significant, the Service need not determine whether the species is endangered or threatened there. Likewise, if the Service considers status first and determines that the species is not endangered or threatened in a portion of its range, the Service need not determine if that portion is significant. However, if the Service determines that both a portion of the range of a species is significant and the species is endangered or threatened there, the Service will specify that portion of the range as endangered or threatened under section 4(c)(1) of the Act.

The primary threats to the valley elderberry longhorn beetle occur throughout the species' range and are not restricted to, or concentrated in, any particular portion of that range. The primary threats of loss or modification of habitat, invasive plants, predation, and pesticides are impacting valley elderberry longhorn beetle populations throughout the species' range. The effects of climate change are also acting on the valley elderberry longhorn beetle throughout its range. Thus, we conclude that threats impacting the valley elderberry longhorn beetle are not concentrated in certain areas, and, thus, there are no significant portions of its range where the species should be classified as an endangered species. Accordingly, this withdrawal and our determination that the valley elderberry longhorn beetle remains listed as a threatened species applies throughout the species' entire range.

Summary of Comments and Recommendations

In the proposed rule published on October 2, 2012 (77 FR 60238), we requested that all interested parties submit written comments on the proposal by December 3, 2012. We also contacted appropriate Federal and State agencies, scientific experts and organizations, and other interested parties and invited them to comment on the proposal. A newspaper notice inviting general public comment was published in the Sacramento Bee on October 12, 2012. We did not receive any requests for a public hearing. We reopened the comment period on January 23, 2013 (78 FR 4812) to allow all interested parties an additional opportunity to comment on the proposed rule and to submit

information on the status of the species. The final comment period closed February 22, 2013.

During the two comment periods for the proposed rule, we received comments from 35 different entities or individuals (not including peer review comments) addressing the proposed delisting of the valley elderberry longhorn beetle. Submitted comments were both supportive of and against delisting the species. All substantive information provided during the comment periods has either been incorporated directly into this withdrawal or addressed below.

Peer Review

In accordance with our peer review policy published on July 1, 1994 (59 FR 34270) and the Office of Management and Budget's December 16, 2004, Final Information Quality Bulletin for Peer Review, we solicited expert opinion from four appropriate and independent specialists with scientific expertise of the life history and biology of the valley elderberry longhorn beetle and riparian systems in the Central valley of California. The peer review process was facilitated by Atkins, North America, and a final report of the peer review, including all comments, was prepared in January 2013 (Atkins 2013, entire), and made available on the Internet at *http://www.regulations.gov* at Docket No. FWS–R8–ES–2011–0063.

We used the 10 questions posed to the peer reviewers as described in the final peer review report (Atkins 2013, entire) to organize and summarize the comments received from the four peer reviewers, including substantive issues and new information relevant to the valley elderberry longhorn beetle. The peer review comments are summarized and addressed in the following section based on 10 questions posed to the peer reviewers by the Service. Relevant information contained in both the summary of the peer reviewer comments and by individual peer reviewers has been incorporated into this rule, where appropriate.

Peer Review Comments

(1) Comment: All four peer reviewers identified instances in which the descriptions, analyses, and biological findings and conclusions presented in the proposed rule are not supported by the available data, and stated that further explanation is needed on the limitations of the data, assumptions, and rationale for dismissing certain topics. Two peer reviewers questioned the conclusions in the proposed rule regarding the range of the valley elderberry longhorn beetle, and all reviewers noted that the CNDDB records used to define the locations of extant locations of the species are outdated, may not be accurate, or may be misidentified for the non-listed California elderberry longhorn beetle. For example, two peer reviewers questioned the validity of the CNDDB use of exit holes in elderberry stems as a measure of the presence of the valley elderberry longhorn beetle. Three peer reviewers also commented on the lack of population size and trend estimates and the lack of available data for newer mitigation and restoration sites.

Our Response: For this rule, we reevaluated the quality and addressed the limitations of the available species occurrence information. We then developed a revised description of the location of observations of adult valley elderberry longhorn beetles or exit holes, and prepared new distribution maps based on surveys conducted since 1997 (16 years). We believe this time period represents a conservative, but reasonable period for evaluating available occurrence information as this was the year in which the most recent, comprehensive rangewide survey was conducted by observers known to be qualified to detect occupancy of the species. We included a more detailed description of our analyses including how we reevaluated the available occurrence information, including those locations that may represent observations of the other subspecies found in California (see *Population Distribution*, *Presumed Historical Range*, and *Current Distribution (since 1997)* sections), thus addressing the peer reviewers concerns related to outdated, inaccurate, or misidentified CNDDB records. We also included available summaries of observations from both mitigation and restoration sites, and acknowledged the limitations with these and other data sets (e.g., see *Restoration and Mitigation Sites* section).

(2) Comment: All four peer reviewers stated that different conclusions than those presented in the proposed rule could be drawn due to limitations of available data (data gaps), and our over-simplification and over-estimation of the available data. Specifically, one peer reviewer stated that we overlooked important and well-documented uncertainties in the available data, while another stated that there may be fewer than the

26 locations identified in the proposed rule, which would affect our conclusions concerning the effects of threats. Another peer reviewer stated that many of the 26 locations should be disregarded given the lack of current information and that our characterization of habitat at some of these locations was questionable.

Our Response: To address all of these concerns (e.g., the potential to draw different conclusions, uncertainties in the best available data, the locations for the species based on occurrence records), we reevaluated all available spatial data and provided an updated historical distribution map based on Chemsak's (2005, p. 7) distributional map and observations of only adult male valley elderberry longhorn beetles (see *Current Distribution (since 1997)* section). Based on that analysis, we selected data sets (1) within this revised distribution; (2) within the past 16 years; and (3) those records from CNDDB (2013, entire) ranked fair, good, or excellent to develop a depiction of the presumed extant occurrences map for the species (see Figure 2), while acknowledging the limitations with these data. We also incorporated studies documenting the essential life-history and habitat requirements for both the host plant and the valley elderberry longhorn beetle, and described the species' distribution in the context of a metapopulation structure and fragmented habitat.

We then prepared a new summary of the valley elderberry longhorn beetle's occurrence in the Central Valley and identified the areas of presumed occupancy based on hydrologic unit as well as geographic location (see Table 1). For this reevaluation, we did not compare these areas to those identified at listing. Although evidence of

occupancy (primarily observations of exit holes) for the species has been documented in additional locations than recorded at the time of listing in 1980, we believe this is the result of limited data available at the time of listing and the subsequent surveys that have better defined the presumed historical range of the valley elderberry longhorn beetle (see *Population Distribution*, *Presumed Historical Range*, and *Current Distribution (since 1997)* sections). We acknowledge in this withdrawal that there are no current estimates of population size or trends in population numbers for the valley elderberry longhorn beetle, but we have included and evaluated estimates of occupancy, where available, in our discussion of population distribution and in our analysis of threats.

(3) Comment: All four peer reviewers expressed concerns regarding the accuracy and balance of our review and analysis of factors relating to threats to the valley elderberry longhorn beetle. One peer reviewer stated that the proposed rule did not provide accurate and balanced reviews, and analyses of factors relating to the threats of the species, and other reviewers stated that a more thorough analysis incorporating key omissions could result in different conclusions regarding the threats to the species and population trends. Specifically, one reviewer recommended that the rule broaden the discussion of effects of climate change, while two others stated that potential threats posed by invasive plants should be discussed. One peer reviewer also stated that a discussion of potential effects of pesticides and genetic issues was incomplete and possibly misleading. Two peer reviewers stated that the discussion of threats from Argentine ants was not adequate in the proposed rule and we did not provide an accurate

assessment of this threat. Finally, another reviewer stated that there were no analyses of combined threats at each location.

Our Response: In this document, we prepared a revised analysis of potential threats to the species, and have provided additional or revised discussions of potential threats related to climate change effects, as well as invasive plants, pesticides, and predatory ants (see the specific sections provided under **Summary of Factors Affecting the Species** above).

Currently, the best available data do not indicate that genetic issues are a potential threat to the population structure of the valley elderberry longhorn beetle, and we are unaware of studies that have investigated valley elderberry longhorn beetle genetics related to the population structure described for this species. We also note that Talley *et al*. (2006a, p. 7) recommended a systematic geographic morphological and genetic study to determine the degree of overlap and interbreeding between valley elderberry longhorn beetle and the California elderberry longhorn beetle.

(4) Comment: All peer reviewers commented on the limitations of the 30-year-old Recovery Plan (Service 1984) and, therefore, the difficulty in assessing whether those objectives had been met as discussed in our proposed rule. The peer reviewers indicated that the delisting criteria we refer to in the proposed rule (i.e., number of sites and populations necessary to delist the species) were not established in the Recovery Plan and

the proposed rule does not assess quantitative data from recent (within the past 2 years) censuses and habitat evaluations to address an important (interim) recovery objective.

Our Response: We recognize that the Recovery Plan identified only interim objectives. Because we are withdrawing our proposal to delist the valley elderberry longhorn beetle, we did not address recovery objectives, implementation, and evaluation in this document. However, we will consider the information provided by the peer reviewers, results from studies and surveys that were not available at the time the Recovery Plan was written, and our reanalysis of the threats presented in this document in any revision of the Recovery Plan for the valley elderberry longhorn beetle.

(5) Comment: All peer reviewers provided examples of conclusions in the proposed rule that they believe were not supported by the best available science. Specifically, one peer reviewer stated that no published studies unambiguously support the continued existence of the valley elderberry longhorn beetle at no more than 12 locations and that our evaluation of threats to the species from the nonnative Argentine ant is contrary to published studies. Another peer reviewer noted that the conclusions in the proposed rule do not agree with the findings of Chemsak (2005) for the valley elderberry longhorn beetle, and that this important reference was not included in the proposed rule. One peer reviewer stated that we did not include more recent studies and that we overlooked the concept of habitat dynamics and effects on metapopulations. Another peer reviewer stated that we disregarded negative data or conclusions, particularly when these data were limited to a few sites.

Our Response: In this document, we reevaluated the occurrence data for the valley elderberry longhorn beetle and developed a new presumed historical range map based on observations of adult males (see our response to Comments (1) and (2) above). We reviewed the quality and limitations of occurrence records for the past 16 years and their geographical locations, and present a revised summary of the locations of these records based on hydrologic units (see Table 1 in *Current Distribution (since 1997)* section) and presumed extant occurrences map (Figure 2). With regard to Chemsak (2005), we did not have access to this information during the preparation of the proposed rule because it was not publicly available, but we were able to locate it from the publisher and used this reference in preparing our presumed historical range map (Figure 1). We included a revised discussion of the potential threats posed to the valley elderberry longhorn beetle from predators such as the nonnative Argentine ant (see **Summary of Factors Affecting the Species** above). In our **Background** section, we included a more detailed discussion of the species' habitat and population structure, including a summary of studies identifying its metapopulation characteristics.

Following a revised analysis of the best available biological information, including new information received, and a revised five-factor analysis of the potential threats to the valley elderberry longhorn beetle, we concluded that threats related to loss or modification of additional habitat from levee and flood protection measures and the effects of climate change, predation, and cumulative effects of stressors have not been sufficiently reduced; therefore, delisting is not warranted for this species at this time.

(6) Comment: All of the peer reviewers provided examples of significant peer-reviewed scientific papers that were not included in the proposed rule and that they believed would enhance the scientific quality of our assessment. A total of 11 additional papers were provided in the peer review report, with Chemsak (2005) being the most noteworthy example of new information because of its distributional information for both the valley elderberry longhorn beetle and the California elderberry longhorn beetle.

Our Response: We were unable to obtain the Chemsak (2005) reference prior to conducting our analysis for the proposed delisting rule. The Chemsak (2005) reference is not currently in print, but we were able to obtain a copy of the relevant sections for the *Desmocerus* genus in California from the publisher (Nuckols 2013, pers. comm.). We georeferenced the distribution maps from this publication for the two elderberry longhorn beetles and used these results as the starting point for developing and preparing our presumed historical range map (Service 2014, GIS Analysis; see also the *Presumed Historical Range* section above). While preparing this rule, we also reviewed and incorporated information from relevant references and studies suggested by the peer reviewers as well as other studies or survey reports that were not included in our proposed rule. As stated previously, following a revised analysis of the best available scientific information, including the information provided by the peer reviewers, we concluded that delisting is not warranted for this species at this time (see **Determination** section above).

(7) Comment: Peer reviewers provided a number of responses as to whether we accurately assessed the efficacy of past and ongoing valley elderberry longhorn beetle management activities relative to its overall conservation and recovery. One peer reviewer indicated that management activities are described in detail in the proposed rule, but stated that estimates of success were based on the amount of habitat acquired, protected, or restored, rather than monitoring results. The reviewer also noted that at some of these sites, the valley elderberry longhorn beetle populations appeared to be declining. Another peer reviewer highlighted two studies where approximately 25 percent of suitable habitat was occupied and discussed the potential for incorrect interpretations in our analyses and findings presented in the proposed rule when relying on exit holes instead of adult observations. A third peer reviewer stated that our assessment of the efficacy of management activities was appropriately addressed, but a fourth peer reviewer said that we had not done so, and added that we had not adequately monitored and managed for the valley elderberry longhorn beetle, including reviewing mitigation reports to evaluate the success of those sites.

Our Response: With regard to restoration, mitigation, and management activities for valley elderberry longhorn beetle, we included specific discussions in this document, as well as the conclusions from studies that evaluated the success of these management actions (see *Restoration and Mitigation Sites* in the **Background** section and our *Factor D* discussion of restoration efforts at National Wildlife Refuges). We also noted there are gaps in monitoring at mitigation sites and there is a need for better data management, including locating missing monitoring reports (as described by the review presented in

Holyoak *et al*. (2010, entire)) that could be important for future analyses (see **Background** section). To address the comment regarding occupancy and interpretation of the data sets using only exit holes, we summarized estimates of occupancy for the valley elderberry longhorn beetle (see *Population Structure* section), and as noted in our response to Comments 1, 2, 5, and 6, we reviewed the quality and limitations of occurrence records for the past 16 years and their geographical locations, and presented a revised summary of the locations of these records based on hydrologic units (see Table 1 in *Current Distribution (since 1997)* section) and presumed extant occurrences map (Figure 2).

(8) Comment: The peer reviewers indicated that, in general, the proposed rule was sufficient relative to the level of detail provided. However, one peer reviewer found the rule contained too much detail on habitat protection and restoration for sites where the valley elderberry longhorn beetle has not been reported, while another found that additional analysis was needed on the potential threat of climate change.

Our Response: We restructured much of the information presented in the proposed rule such that irrelevant details were removed and replaced with new and more relevant information. We presented a new analysis of the range of the valley elderberry longhorn beetle, while acknowledging the limitations of the available data and the need to collect additional information regarding its current abundance and distribution. We also provided an extensive discussion of climate change effects in our analysis of threats, and incorporated predictions from several regional climate models for the Central Valley

region. We incorporated details of results of several studies (e.g., metapopulation analysis) and used this information to evaluate the current threats to the species.

(9) Comment: All peer reviewers found the scientific foundation of the proposed rule to be fundamentally unsound due to important omissions, old and missing data, and potentially erroneous conclusions. The peer reviewers provided several suggestions for improving the scientific foundation of our analysis prior to making a subsequent final determination. These include: providing a better evaluation of the current locations of populations, using specimen records or adult beetle observations rather than relying on exit holes and old records, and evaluating the status of the species in a way that incorporates concepts of metapopulation dynamics or spatial ecology.

Our Response: As noted above (see responses to Comments 1, 2, 5, and 6), this document incorporated new analyses, additional information, and included a discussion on the population structure (see *Population Structure* section) that species experts have defined for the valley elderberry longhorn beetle. We reevaluated the threats to the species and concluded that the threats have not been reduced such that the protections of the Act are no longer necessary. Thus, we determined that delisting is not warranted for this species, and we are withdrawing our proposed rule.

(10) Comment: All peer reviewers highlighted several uncertainties with the data upon which we based our assessment of the current status of the valley elderberry

longhorn beetle in the proposed rule, including its range and the effects of climate change on the species.

Our Response: We reanalyzed the historical and presumed extant occurrences of the valley elderberry longhorn beetle (see response to Comments 1 and 2), while acknowledging the limitations of the available data and the need to conduct additional studies in order to develop population trends for this species and its habitat (see *Population Structure* Section). As noted above (see response to Comment 8), we also included an extensive discussion of climate change effects in our analysis of threats, and incorporated predictions from several regional climate models for the Central Valley region (see Climate Change discussion under *Factor A* above).

County and Local Agency Comments

(11) Comment: Eleven different agencies submitted comments supporting the proposed rule to delist the valley elderberry longhorn beetle. The primary reasons for support include:

(a) Conclusions presented in the proposed rule that indicate that population numbers of the valley elderberry longhorn beetle have increased to the point where continued Federal protection is no longer necessary and that the species is now found in more protected locations.

(b) Monetary and time costs to flood control and other projects proposed or maintained by these agencies associated with addressing the regulatory requirements for

the federally listed valley elderberry longhorn beetle, including compliance with the Service's *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (Conservation Guidelines) (Service 1999, entire), extensive surveys of individual elderberry shrubs, and mitigation requirements (*Mitigation Guidelines for the Valley Elderberry Longhorn Beetle*; Service 1996, entire). Specific comments on this issue were provided to support their position such as the need for a flexible and efficient regulatory framework to facilitate construction of utilities and other projects, and a balance between habitat conservation policies and public needs (including publicly funded projects).

(c) The Service recommended delisting the species in its 2006 5-year review (Service 2006a).

Our Response: Under the Act, we determine that a species is an endangered or threatened species 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. Following our revised analysis of these factors, including the new information received during the open comment period related to occupancy estimates of the valley elderberry longhorn beetle and its occurrence records, the best available data indicate that the species remains likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Thus, we are withdrawing our proposal to delist the valley elderberry longhorn beetle.

Our next 5-year review will reflect the analyses presented in this rule and any other new information we receive regarding the status of the species.

We appreciate the comments received citing the monetary and time costs in response to protections to the valley elderberry longhorn beetle under the Act. We recognize the need to update our Conservation Guidelines (Service 1996, 1999) to allow for additional flexibility as well as to incorporate new information on the species regarding presumed historical range and scientific studies completed and published since 1999 that have evaluated threats to the species and its habitat. We have initiated the process to revise these guidelines in concert with our reanalysis of our proposed rule. We also appreciate the willingness expressed by some of the commenters to consider revising these policies rather than delisting in order to ensure the recovery of the species and conservation of its habitat. We will continue to work with local governments, levee districts, and other entities with responsibilities to maintain flood control structures and other infrastructure to secure the appropriate permits and authorizations under the Act when it becomes necessary to maintain the structures.

(12) Comment: Four agencies submitted comments stating that maintaining a federally protected status (i.e., as an endangered or threatened species under the Act) for the valley elderberry longhorn beetle has created disincentives that inhibit the creation and protection of elderberry habitat. In other words, the commenters believe that more habitat would exist for the species without the protections required under the Act because floodplain management entities do not want operations and maintenance restrictions that

result from having valley elderberry longhorn beetle within their areas of responsibility. Three of the agencies stated that naturally colonized elderberry shrubs (seedlings) are removed and elderberry plantings are not being included within restoration and mitigation plans. One of the commenters further stated that delisting the species would give flood management entities greater flexibility in vegetation removal, which in turn could allow for increased elderberry shrub proliferation that may benefit both flood control operation goals and conservation of the valley elderberry longhorn beetle.

Our Response: We are aware of the opinions provided by these commenters, and we will continue to work with various agencies to create or enhance partnerships (see *Factor D* above) to reduce perceived disincentives and provide solutions to these issues.

(13) Comment: A commenter stated that the Service's delay in identifying and removing the valley elderberry longhorn beetle from the Federal List of Endangered and Threatened Wildlife has eroded public confidence and support for the species and the Act. The commenter also stated that, during the development of a post-delisting monitoring plan, it is imperative that local agencies and private partners (including local landowners) have an equal voice with Federal and State agencies so that private property rights and disadvantaged communities are not unduly and adversely impacted.

Our Response: We appreciate the commenter's feedback regarding our evaluation process under section 4(a) of the Act. The Act requires us to use the best commercial and scientific information available to make determinations as to whether a

species may be considered endangered or threatened. In this document, we reevaluated the best scientific and commercial information available for the valley elderberry longhorn beetle, including peer review comments on the scientific findings in the proposed rule, agency comments, and public or other interested party comments, and new information on occurrences, distribution, and threats to the valley elderberry longhorn beetle. Our reanalysis of the five factors that determine if a species meets the definition of endangered or threatened (according to section 4(a) of the Act) that is presented in this document indicates that the valley elderberry longhorn beetle continues to meet the definition of a threatened species (i.e., it is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range). Thus, we are withdrawing our proposal to delist the species and ceasing preparation of a post-delisting monitoring plan, which is no longer appropriate at this time.

(14) Comment: We received a combined comment from two agencies stating that the removal of the species from the Federal List of Endangered and Threatened Wildlife would result in larger social and ecological benefits by enabling the use of limited Federal resources on other high-priority conservation actions. The commenters referenced the draft *Bay Delta Conservation Plan* (BDCP), which is currently under development. The commenters requested that final action on the proposed delisting be completed as soon as possible in order to avoid unnecessary commitments of resources in the development of the BDCP and with their efforts to comply with Federal and State environmental laws.

Our Response: See response to Comment 11. The Draft BDCP and associated Draft Environmental Impact Report/Environmental Impact Statement are being made available to the public for review and comment for a 228-day review period (December 13, 2013 through July 29, 2014). We will continue to work with our partners during the development and finalization of the BDCP.

(15) Comment: One commenter stated they had significant delays in consulting with the Service on the valley elderberry longhorn beetle, including performing environmental analyses and complying with conservation protocols, which they believe greatly lengthened the time to implement flood protection measures. The commenter also noted that in those cases where entities choose to mitigate impacts to the valley elderberry longhorn beetle onsite, the costs of monitoring and protecting the elderberry plants are ongoing and significant because of the species' protected status; thus, public entities have a cost incentive to instead mitigate by purchasing credits offsite. The commenter stated that this mitigation strategy results in removal of the species and elderberry from the riparian corridor, which is also a negative impact for other species that use elderberry in riparian corridors of the Central Valley. Finally, the commenter stated they have been supportive of protections for the species including their demonstrated efforts to restore and mitigate for setback levee projects.

Our Response: We appreciate the feedback regarding the consultation process and implementation of mitigation guidelines. We recognize and appreciate any past,

ongoing, and future conservation efforts that may help conserve valley elderberry longhorn beetle and its habitat.

Federal Agency Comments

(16) Comment: The U.S. Forest Service, Pacific Southwest Region (Regional Office R5) indicated that, should the valley elderberry longhorn beetle be delisted, the Forest Service would retain the species as a Regional Forester's Sensitive Species (for at least 5 years), and it would, therefore, be evaluated relative to any proposed project within the range of the species or its known habitat. The agency provided location information for observations of exit holes and elderberry shrubs within the Region's National Forests (Stanislaus, El Dorado, and Sierra). The Forest Service also indicated that actions are taken and would be taken by the agency in the future that provide protection for the species and its habitat.

Our Response: We appreciate the Forest Service's commitment to assist in the conservation of the valley elderberry longhorn beetle and its habitat, regardless of whether the species is delisted. We requested and received updated (as of 2014) information on elderberry shrub locations and observations of exit holes, and have used the information in this document and added it to our GIS database. We note here that the observation of exit holes within the Sierra National Forest is outside our presumed historical range for the species (see Figure 1). Without an observation of an adult male,

we cannot confirm whether this location represents the valley elderberry longhorn beetle or the California elderberry longhorn beetle.

Public Comments

(17) Comment: Four commenters supported delisting the valley elderberry longhorn beetle. Reasons for supporting the delisting included: (a) conclusions presented in the proposed rule that indicate population numbers of the valley elderberry longhorn beetle have increased to the point where continued Federal protection is no longer necessary and that the species is now found in more protected locations, and (b) monetary and time costs to flood control and other projects, with one commenter stating that a delisting decision would result in significant monetary savings to taxpayers. Specific comments were also provided regarding the consequences of delays in levee improvements to ensure the protection of property, and the inability of property owners to make improvements to their property despite homeless camps on that same property and the use of elderberry shrubs as firewood.

Our Response: Under the Act, we determine that a species is an endangered or threatened species 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. Based on our analysis of these factors, we concluded

that the species continues to warrant listing as threatened (i.e., likely to become endangered in the foreseeable future within a significant portion of its range under the Act); thus, we are withdrawing our proposal to delist the species.

We have and will continue to work with local governments, levee districts, the Corps, and other entities with responsibilities to maintain flood control structures and other infrastructure to secure the appropriate permits and authorizations under the Act when it becomes necessary to maintain the structures. It is a priority for us to facilitate the safety of communities and farmland protected by levees, and when we are aware of levee or bridge projects that may impact the valley elderberry longhorn beetle and its habitat, we work with the appropriate authorities to secure the necessary permits. We are aware that homeless camps are established in certain locations in the Central Valley that contain elderberry habitat. When requested, we work proactively with local governments to manage these complex situations and protect habitat.

(18) Comment: Five commenters stated that the valley elderberry longhorn beetle should not be delisted for the following reasons:

(a) The primary threats (e.g., habitat loss) to the valley elderberry longhorn beetle remain or have increased since listing.

(b) The species has not recovered, its status has not improved since listing and may be declining, and its range has been reduced since listing due to loss of habitat. Specifically, there is no evidence to show that the species has recovered; that is, the inferred methods to determine occupancy described in the proposed delisting rule lack the

science needed to determine a successful recovery of the species and, further, the population increase described in the proposed rule is the result of a greater survey effort and not a real indication of an actual population size or trend.

(c) Additional locations where evidence of the species has been observed since listing are not protected, have not been adequately monitored, and there is evidence of extirpation from some locations due to complete loss of elderberry habitat. One commenter stated that records since listing show limited numbers of the species may currently occupy a limited number of locations, and another commenter noted that it was incorrect to assume that occurrence records represent existing populations or that those locations are currently protected.

(d) Many observations of exit holes or adult beetles are old and may not have correctly identified the species and its status, resulting in an overestimation of the presence of the species. In addition, elderberry shrubs may have also been misidentified by environmental consulting firms conducting surveys for the species or its habitat.

(e) The host plant is not rare or common, but is limited and discontinuously distributed across the species' range.

(f) The proposed rule is inconsistent with conclusions made by Talley *et al*. (2006a, entire) regarding the status of the species and threats described in that document.

(g) The proposed rule does not provide sufficient estimates of either: (1) Relative sizes of elderberry habitat areas in individual sites or regions; or (2) the populations of the beetle, within sites, or the subspecies as a whole; therefore, the number of beetles in each local population could be much smaller and, in some locations, may not be currently occupied at all.

(h) The location information presented in the proposed rule does not provide details on the extent of the geographical areas (or length of river systems) and may only represent a point location of a single elderberry plant or a few plants; large sections in these geographical locations may have no habitat.

(i) The delisting of the valley elderberry longhorn beetle would remove the limited protections provided under the Act at many locations and increase the risk of local extirpation. One commenter stated that local protections to the species' habitat can be beneficial, but they do not apply to all (or even most) areas, are uncertain or may be ineffective, and do not provide a regional approach needed to address large-scale threats (e.g., climate change) to riparian ecosystems.

(j) The proposed rule assumes that the rarity of the species is natural and this fact justifies the delisting, but rare species are more sensitive to threats. One commenter added that, because the species occurs in regional populations composed of patches of small, local populations (metapopulation of just a few individuals), their life history (and survival) is heavily influenced by chance events (see **Background** section above).

(k) Threats to the valley elderberry longhorn beetle and its habitat from the spread of the Argentine ant, an invasive species and potential predator; specifically, one commenter stated that the presence of elderberry shrubs does not demonstrate recovery because the Service has not monitored the presence of these types of predators. This commenter stated that other studies have shown that similarly situated beetles, such as the eucalyptus borer (*Phoracantha semipunctata*), were found to decline in numbers when present in locations alongside the Argentine ant.

(l) Threats from invasive, nonnative plants (believed to be introduced from neighboring development) to the elderberry plant, which commenters described as an important natural resource for the valley elderberry longhorn beetle and other wildlife in California's Central Valley.

(m) Other potential threats to the species including the effects of climate change, pesticide use, edge effects associated with urban and agricultural development, inadvertent pruning, and levee maintenance.

(n) An incorrect assumption in the proposed rule that the appearance of sufficient elderberry meets the habitat requirements of the valley elderberry longhorn beetle.

(o) Overall lack of scientific rigor in the document and the need for more rigorous scientific study by knowledgeable species experts to conclude the success of the Service's recovery efforts.

(p) Lack of acknowledgement of fragmentation of habitat that has reduced connectivity of habitat, as well as habitat patch size, which directly affects this species (due to its low mobility, low population size, and metapopulation structure) and many other species that rely on contiguous and larger habitat patch sizes or distances for their survival or recovery

Our Response: We appreciate the commenters' concerns and recommendations regarding the need to determine valley elderberry longhorn beetle persistence and threats that may be impacting the species, such as activities or conditions (e.g., changes in climate) that result in habitat loss, nonnative plant invasions, or predation. In this document, we provided our best estimate of the current population distribution of the

species (see *Current Distribution (since 1997)* section), but acknowledged the limitations in identifying occupancy through the amount of elderberry habitat or riparian vegetation or use of observations of exit holes as evidence of presence in order to estimate population trends. We also indicated that population studies are needed to better assess the status of the species throughout its presumed historical range.

We included in this withdrawal a revised description of the threats to the species (see **Summary of Factors Affecting the Species**), including revised or new discussions of the threats posed by loss of habitat, levee management, habitat destruction or modification related to climate change effects, invasive nonnative plants, predation, and pesticide use. Although literature was not submitted for studies referenced by one commenter regarding effects to the eucalyptus borer from the Argentine ant, we included in this withdrawal document relevant results of a 1992 publication (Way *et al*. 1992, entire) that evaluated predation impacts to an arboreal borer (*Phoracantha semipunctata*) from the Argentine ant (see **Background** section above).

As in our proposed rule, we also discuss in this withdrawal the nearly 90 percent loss of riparian vegetation in the Central Valley, and the fragmentation of this habitat that has resulted in a locally uncommon or rare and patchy distribution of the valley elderberry longhorn beetle within its remaining presumed historical range in the Central Valley (see *Historical Loss of Riparian Ecosystems* discussion under *Factor A*). Based on our revised five-factor analysis of threats, we believe the species continues to meet the definition of a threatened species (i.e., likely to become an endangered species in the

foreseeable future within a significant portion of its range), and we are withdrawing our proposal to delist the species.

(19) Comment: One commenter stated that further clarity of the definition of what constitutes an elderberry shrub in the Conservation Guidelines (Service 1999) is needed. The commenter recommended using the following definition from leading valley elderberry longhorn beetle researchers: "*In order to be considered a shrub, an elderberry plant must have one or more stems 1 inch (2.5 cm) or greater in diameter and for purposes of counting the number of shrubs, a group of shoots that originates from the same root system or a group of shoots that occurs within a 16.4 foot (5 m) radius will be considered one shrub.*" [no citation provided]. In addition, the commenter recommended that we reevaluate our assessment of the effects of pruning elderberry on the valley elderberry longhorn beetle, based on the results of studies presented in Talley and Holyoak (2009). Finally, the commenter recommended that we consider working with the Valley Elderberry Longhorn Beetle Collaborative, which is a group of State agencies, resource managers, researchers, and utilities whose goals are to improve the viability of the valley elderberry longhorn beetle and assist the Service in developing more effective mitigation requirements and improved the Conservation Guidelines.

Our Response: We included a discussion of the study cited in the comment letter in our *Factor A* discussion, including additional information on potential effects of pruning (see Pruning section under *Factor A*). As noted in our response to Comment 11 above, we initiated the process to revise these guidelines in concert with our reanalysis of

the proposed rule. Finally, we appreciate the recommendation provided regarding the opportunity to work with our partners and the Valley Elderberry Longhorn Beetle Collaborative, and we look forward to working as a team to develop conservation measures that benefit the recovery of the species.

(20) Comment: One commenter recommended that we conduct a thorough inventory of all current and recent conservation, restoration, and mitigation activities affecting the species and its habitat within the Central Valley, as well as an analysis of likely future actions under such broad programs as the Central Valley Flood Protection Plan and the BDCP.

Our Response: We agree that the commenter's recommendations for surveys and an accounting of various conservation, restoration, and mitigation activities (including the Central Valley Flood Protection Plan and BDCP) would provide more information that would be helpful in future evaluations of the status of the species, and we will consider this information in future conservation planning efforts, including any future revisions to the species recovery plan.

(21) Comment: A natural lands management organization stated that, based on the information they have collected or reviewed pertaining to the preserves they manage in the Central Valley, uncertainty remains about the stability of the valley elderberry longhorn beetle within this part of its range. The commenter provided information on the status of the valley elderberry longhorn beetle and its habitat, based on the management

and the experience of their preserve managers, and identified potential threats to elderberry habitat in these areas and the need for additional funding to support specific management activities that benefit the species.

Our Response: We appreciate the information provided by the organization regarding the preserves they manage and the status of the species in these areas. We incorporated this information in the **Background** section of this rule and used this information in our reanalysis described in this document, including the **Summary of Factors Affecting the Species**.

(22) Comment: A manager of a valley elderberry longhorn beetle conservation bank provided information on plantings of elderberry shrubs (and associated plants) stating that adult valley elderberry longhorn beetles have yet to be seen adjacent to or within the conservation bank, despite these restoration efforts. The commenter also submitted opinions regarding the approach to recovery efforts that has focused, in part, on providing elderberry habitat for the species ("build it and they will come") rather than cultivation and disbursement of transplanted elderberry shrubs from project sites to conservation banks, especially those assumed to contain exit holes.

Our Response: We appreciate the personal observations provided regarding the occupancy of the valley elderberry longhorn beetle at this conservation bank. We will consider the commenters' recommendations regarding focusing recovery efforts on

elderberry cultivation and disbursement as we revise the Conservation Guidelines (Service 1996), and revise the recovery plan for the valley elderberry longhorn beetle.

(23) Comment: One commenter stated that the peer review report (Atkins 2013, entire) did not accurately represent the science and did not adequately summarize the peer reviewer comments. The commenter also cited concerns with a recommendation by one of the peer reviewers regarding the use of pheromones as a method to evaluate the status of the species (through the attraction of adult male beetles), noting its use has not been shown to be effective on this subspecies and that conclusions drawn would not provide information on habitat loss; thus, direct observations should still be considered.

Our Response: We requested a peer review of the valley elderberry longhorn beetle proposed rule and were provided individual comments from each peer reviewer as well as a summary of the overall (collective) peer review evaluation. This withdrawal incorporated this information and addresses both the collective and individual comments provided by the peer reviewers (see response to Comments 1 through 10 above). We included in this withdrawal a summary of preliminary results from pheromone studies (e.g., Ray *et al*. 2012, entire; Arnold 2013, entire; see **Background** section above). In our **Determination** section, we note that a second year of trial surveys using pheromones is currently under way (Sanchez 2014, pers. comm.) to further evaluate the efficacy of this method in evaluating populations of the valley elderberry longhorn beetle within parts of its presumed range.

(24) Comment: One commenter expressed concerns regarding the Service's rule-making process used to prepare the proposed delisting rule, including our internal review process, pointing out discrepancies in the proposed rule with previous Service documents. The commenter concluded that the only course of action was to publish a finding that delisting was not warranted and prepare a new 5-year review, revise the current Recovery Plan, update the Conservation Guidelines (Service 1999), and consider redesignation of critical habitat to a much broader area, including both occupied and unoccupied habitat that may be important to reducing the fragmentation effect of the species' current habitat.

Our Response: Under the Act, we determine that a species is an endangered or threatened species 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. Our analysis of these factors in this document shows that the species continues to meet the definition of a threatened species (i.e., likely to become an endangered species in the foreseeable future throughout all or a significant portion of its range). Therefore, we are withdrawing our proposal to delist the species.

We recognize the need for additional actions regarding the valley elderberry longhorn beetle (e.g., revision of the Conservation Guidelines (Service 1996)). We will take into consideration various conservation-related recommendations provided by the

commenter when conducting the next 5-year review and during any revision of a recovery plan for the species. In addition, we have initiated the process to revise the Conservation Guidelines concurrent with our reanalysis of the best available information presented in this document.

(25) Comment: One commenter stated that much more information, particularly with regard to population stability in multiple areas, is needed than currently exists to determine a proposed delisting for this species. The commenter noted the delisting rule repeatedly states there are minimal surveys and data uncertainties making it difficult at this time to make a determination of the species' population status; however, the delisting document simultaneously acknowledges and ignores these information gaps. The commenter stated there is no scientific evidence that the geographic range of the valley elderberry longhorn beetle has expanded nor is there evidence that populations within locations have increased since listing. The commenter further explained that, because the species is naturally rare and occurs only in small, local populations with just a few individuals within any one site, increases of individuals within sites would not necessarily be expected if recovery was occurring. The commenter indicated, while restoration efforts have created or enhanced some of the lost riparian vegetation, only a fraction of a percent of what was historically lost has been provided, and that long-term trends of the species' population structure throughout its range are still needed to determine whether its populations are persistent, resilient, resistant, and not variable.

Our Response: As noted in our response to Comments 1 and 2, in our **Background** section we reevaluated the occurrence records, incorporated a discussion of the metapopulation structure and limited dispersal ability of the species, and presented a discussion of the success of elderberry restoration and mitigation sites. We also revised our threats analysis (see **Summary of Factors Affecting the Species**) in this withdrawal, including the effects of levee maintenance, pruning, and climate change, invasive plants, and predation. Our analysis of these factors shows that the species continues to warrant listing as a threatened species, and we are withdrawing our proposal to delist the species.

(26) Comment: One commenter stated that, regardless of the final decision regarding delisting, the Service needs to revise its Conservation Guidelines (Service 1999) by incorporating new data on pruning, topping, roadside dust and noise, transplanting, and spatial relationships between the valley elderberry longhorn beetle, its habitat, and environmental stochasticity (random processes or events), which can affect its populations. The commenter suggested that the Service should then bring diverse land users together and collaboratively work with them to develop a priority list of additional research necessary to determine the status of the species.

Our Response: As noted above (see response to Comment 11), we have initiated the process to revise our Conservation and Mitigation Guidelines (Service 1996, 1999).

(27) Comment: One commenter stated that the agency's actions are contrary to law (Administrative Procedure Act) because the agency did not consider alternatives to

delisting the valley elderberry longhorn beetle. The commenter believes that the Service should consider downlisting the valley elderberry longhorn beetle from endangered to threatened given the potential threats of the Argentine ant to populations of the species. The commenter stated that downlisting the beetle from endangered to threatened would allow researchers to undertake a more detailed study of the effects of the Argentine ant on beetle populations, but would still allow for protection under the Act as well as accommodate the concerns of others regarding impacts to economic activity.

Our Response: The species is currently listed as a federally threatened, not endangered, species under the Act (45 FR 52803; August 8, 1980); therefore, we do not have the option of downlisting to threatened. We issued the proposed rule (77 FR 60238; October 2, 2012) 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. This document withdraws that proposed rule because the best scientific and commercial data available, including our reevaluation of information related to the species' range, population distribution, and population structure, indicate that threats to the species and its habitat have not been reduced such that removal of this species from the Federal List of Endangered and Threatened Wildlife is appropriate.

(28) Comment: One commenter stated that the current Recovery Plan (Service 1984) does not address the steps being taken to curb predation from the Argentine ants and instead regards the absence of data as a justification for inaction. As a result, the

commenter believes that the current Recovery Plan does not meet the delisting requirements of the Act.

Our Response: We acknowledge the need to update the Recovery Plan, which was prepared in 1984, and the need for the Recovery Plan to address additional threats discussed in this document, as well as new information on the species' distribution. We will consider new information and recommendations provided by commenters when we update the Recovery Plan in the future.

(29) Comment: One commenter from East Sacramento, California, stated that he has a red elderberry shrub in his backyard and that he has photographed the valley elderberry longhorn beetle on his property on several occasions (three photos were submitted with the comments). The commenter believes his observations give the appearance that the species has a more varied range than what we stated in the proposed delisting rule. The commenter stated that we should determine if his observations are of the valley elderberry longhorn beetle and thus represent a range expansion, and that, if it is found in elderberry in other backyards throughout the Sacramento Valley, then the species may not warrant protection under the Act.

Our Response: We appreciate the beetle observations provided by the commenter. Although the images submitted were slightly out of focus, we requested a species expert review the photos and confirm the identity of the insect. We believe the photos submitted are of *Podabrus pruinosus*, a common cantharid beetle that is part of a

family of beetles frequently referred to as soldier or leather winged beetles; adults of this species are commonly observed in spring and summer and are known to occur in the Central Valley (Arnold 2014c, pers. comm.).

(30) Comment: One commenter provided personal observations of elderberry habitat and its use based on the commenter's farming experience along the Tuolumne River. The commenter stated that his property was inundated with elderberry plants and he observed birds carrying berries (seeds) that were deposited along fences or buildings. The commenter also noted that elderberry roots spread extensively underground and characterized elderberry plants as weeds that interfered with structures on his property.

Our Response: We assume that the commenter provided these comments in order to provide historical information on the amount of elderberry habitat in this area and wildlife use of elderberry plants. In this document, we summarized studies of elderberry characteristics that are important to the life history of the valley elderberry longhorn beetle (see **Background** section). We used this information in conjunction with reported estimates of low occupancy and our estimates of current elderberry habitat within the presumed historical range of the valley elderberry longhorn beetle, and analyzed the threats to the species. We concluded, based on the best scientific available information, that the valley elderberry longhorn beetle continues to warrant listing as threatened, and we are withdrawing our proposal to delist the species.

References Cited

A complete list of all references cited in this document is available on the Internet at *http://www.regulations.gov* at Docket No. FWS–R8–ES–2011–0063 or upon request from the Field Supervisor, Sacramento Fish and Wildlife Office (see **ADDRESSES** section).

Authors

The primary authors of this document are the staff members of the Carlsbad Fish and Wildlife Office and the Pacific Southwest Regional Office.

Authority

The authority for this action is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Dated: August 29, 2014

Signed: Rowan W. Gould

Acting Director, U.S. Fish and Wildlife Service

Billing Code 4310–55

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