



United States Department of the Interior



FISH AND WILDLIFE SERVICE

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In reply refer to:
81420-2008-F-1027-1

APR 4 2008

Mr. Thomas Cavanaugh
Sacramento Office
U.S. Army Corps of Engineers
1325 J Street
Sacramento, California 95814-2922

Subject: Biological Opinion for the proposed Panattoni Business Park Project
(Corps File Number 200400435), Sacramento County, California

Dear Mr. Cavanaugh:

This letter is in response to your August 17, 2005, request for the initiation of formal consultation with the U.S. Fish and Wildlife Service (Service) on the proposed Panattoni Business Park Project (project), in Sacramento County, California. We received your request on August 22, 2005. On September 21, 2005, the Service requested additional information on the proposed project. On January 2, 2008, the Service received the information requested to complete formal consultation on the proposed project. At issue are the proposed project's effects on the federally- threatened vernal pool fairy shrimp (*Branchinecta lynchi*), the endangered vernal pool tadpole shrimp (*Lepidurus packardii*) (vernal pool crustaceans), and the threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*). The Service has determined that it is appropriate to append the proposed project to the *Programmatic Formal Endangered Species Act Consultation on Issuance of 404 Permits for Projects with Relatively Small Effects on Listed Vernal Pool Crustaceans within the Jurisdiction of the Sacramento Field Office, California* (Programmatic Consultation) (Service file number 1-1-97-F-0149). This document contains a programmatic biological opinion for vernal pool crustacean species, and a separate biological opinion for the beetle. The proposed action area is not located within any areas designated or proposed as critical habitat for any federally-listed species; therefore no designated or proposed critical habitat for the species will be adversely modified or destroyed. This response has been prepared in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act).

Based upon the information provided, the Service has determined that the proposed project will not affect the threatened slender Orcutt grass (*Orcuttia tenuis*), and the endangered Sacramento Orcutt grass (*O. viscida*). The Service has made this determination for the slender Orcutt grass,

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and the Sacramento Orcutt grass as a result of negative focused surveys for federally-listed plants on the proposed project site.

This consultation is based on: (1) the August 17, 2005, letter from the U.S. Army Corps of Engineers (Corps), to the Service, requesting initiation of section 7 consultation; (2) the August 10, 2005, *Panattoni Business Park- Revised Wetland Delineation*; (3) the June 8, 2005, *Biological Section 404 Individual Permit Application for Panattoni Business Park*, prepared by ECORP Consulting, Inc; (4) the October 7, 2005, letter from ECORP Consulting Inc (ECORP), to the Service, providing additional information on the proposed project; (5) the October 20, 2005, site visit conducted by Michelle Tovar of the Service at the proposed project site; (6) the August 31, 2007, meeting between the Service, Corps, and ECORP to discuss the proposed project; (7) the November 9, 2007, *Valley Elderberry Longhorn Beetle Survey report*, submitted to the Service; (8) the January 2, 2008, *Panattoni Business Park – Vernal Pool Brachiopod Habitat Assessment*, submitted to the Service; (9) various telephone and electronic mail correspondences between ECORP and the Service; and (10) other information available to the Service.

CONSULTATION HISTORY

August 22, 2005: The Service received a letter from the Corps, dated August 17, 2005, requesting initiation of formal consultation on the Panattoni Business Park Project. Enclosed was the *Panattoni Business Park-Revised Wetland Delineation* and the *Biological Section 404 Individual Permit Application for Panattoni Business Park, Sacramento County, California* and associated documents.

September 21, 2005: The Service requested additional information from the Corps necessary to complete a biological opinion.

October 11, 2005: The Service received a letter from ECORP, dated October 7, 2005, providing additional information on the proposed project.

October 20, 2005: The Service and ECORP conducted a site visit of the proposed project site. There was additional habitat features that the Service wanted assessed.

August 31, 2007: Representatives of ECORP, Corps, and the Service met to discuss the proposed project.

November 14, 2007: The Service received the *Valley Elderberry Longhorn Beetle Survey Report*, dated November 9, 2007.

January 2, 2008: The Service received the *Panattoni Business Park – Vernal Pool Brachiopod Habitat Assessment*, dated October 23, 2007.

Description of the Proposed Action

The proposed project consists of an approximately ± 53-acre site located south of the City of Folsom in Sacramento County, California. The proposed site is within the access-controlled GenCorp/Aerojet Facility and is bordered to the north by Folsom Boulevard, to the east by California Circle, to the south by Alabama Avenue, and to the west by Nimbus Road. The proposed project site has a past history of agricultural and grazing and no active uses are conducted on the site. The site includes a series of man-made drainage ditches, which drain an adjacent hillside and roadways run through the site and is composed of annual grassland, blue oak woodland, and valley foothill riparian.

The proposed project involves construction of eight (8) buildings for office space and the development of associated infrastructure, parking areas and surface streets. The office development and associated construction activities would be located within habitats potentially occupied by vernal pool crustaceans and the Valley elderberry longhorn beetle. There are 1.842 acres of seasonal wetlands, drainages ditches, and seep on the proposed project site. The seasonal wetlands are scattered throughout the site, the drainages ditches on site are comprised of cement lined ditches and man-made ditches with bed and bank characteristics, and the seep is present in the northeast section of the site on the inside edge of a dirt road. The Service has determined that the proposed project is likely to directly affect the vernal pool tadpole shrimp and vernal pool fairy shrimp inhabiting 0.413 acre of habitat. There are a total 70 elderberry shrubs (*Sambucus* sp.) that occur within 100 feet of the proposed project site. The elderberry shrub is the sole host plant for the beetle and the Service has determined that the proposed project is likely to affect the beetle inhabiting the 70 elderberry shrubs comprised of 262 stems greater than 1 inch in diameter at ground level.

Programmatic Consultation for Vernal Pool Crustaceans

Proposed Conservation Measures

The project applicant has proposed to offset the direct affects to 0.413 acre of vernal pool crustacean habitat by purchasing 0.826 acres of vernal pool preservation credits and 0.413 acres of creation credits at a Service-approved vernal pool conservation bank, if no Service-approved ecosystem banks are available where the proposed project is located, the Service may extend the service boundaries of other banks that occur in the same vernal pool region.

Evaluation under Programmatic Consultation

The Service has determined that it is appropriate to append the proposed project to the Programmatic Consultation. This letter is an agreement by the Service to append the proposed project to the Programmatic Consultation and it represents the Service's biological opinion on the effects of the proposed action. Conservation measures for projects appended to the Programmatic Consultation involve the use of creation and preservation banks.

The Service is tracking losses of the two listed crustaceans and their habitat permitted under the Programmatic Consultation. We reevaluate the effectiveness of the Programmatic Consultation at least every six (6) months to ensure that continued implementation will not result in unacceptable effects to the listed species.

The conservation measures identified in the Programmatic Consultation includes the following:

1. **Preservation component.** For every acre of habitat directly or indirectly affected, *a minimum of two* vernal pool credits will be dedicated within a Service-approved ecosystem vernal pool preservation bank: or, based on Service evaluation of site-specific conservation values, three acres of vernal pool habitat may be preserved on the project site or another non-bank site as approved by the Service.
2. **Creation component.** For every acre of habitat directly affected, *a minimum of one* vernal pool creation credit will be dedicated within a Service-approved habitat creation bank: or, based on Service evaluation of site-specific conservation values; two acres of vernal pool habitat will be created and monitored on the project site or another non-bank site as approved by the Service.

The proposed project will result in indirect effects to 0.413 acre of habitat for the two federally listed vernal pool crustaceans. The applicant has agreed to purchase vernal pool preservation and creation credits prior to any site disturbance at a Service-approved ecosystem conservation bank if no Service-approved ecosystem banks are available where the proposed project is located, the Service may extend the service boundaries of other banks that occur in the same vernal pool region. Credits for preservation shall be purchased prior to the fill of any vernal pool areas. The agreed upon conservation responsibilities of the applicant are as follows.

The agreed upon conservation responsibilities of the applicant are as follows:

1. Prior to the start of any earth moving activities at the project site, the project applicant shall purchase at least 0.826 acres (0.413 acre at a 2:1 ratio = 0.826 acre) of vernal pool preservation credits within a Service-approved ecosystem vernal pool preservation bank. If no Service-approved ecosystem banks are available where the proposed project is located, the Service may extend the service boundaries of other banks that occur in the same vernal pool region
2. Prior to the start of any earth moving activities, the applicant shall purchase at least 0.413 acres (0.413 acre at a 1:1 ratio = 0.413) acre of vernal pool creation credits within a Service-approved vernal pool creation bank. If no Service-approved banks are available, and with Service approval, the project applicant may contribute funds to a Service-approved fund account serving the proposed project area.

Conservation Measures:

Additional conservation measures for the proposed project are as follows:

1. The project proponent shall include a copy of the USFWS-issued Biological Opinion (BO) within its construction documents making the primary contractor responsible for implementing all requirements and obligations included within the BO, and to educate and inform all other contractors involved in the project as to the requirements of the BO.
2. A USFWS-approved biologist shall inspect construction-related activities at the proposed project area to ensure that no unauthorized take of federally-listed species or destruction of their habitat occurs. The biologist shall be available for monitoring throughout all phases of construction that may result in adverse effects to vernal pool crustaceans.
3. The contractor will prepare a site-specific Stormwater Pollution Prevention Plan (SWPPP) for the project to protect receiving waters from pollution. The SWPPP will include standard sediment and erosion control measures that include limiting soil disturbances during the winter rainfall season. Given the site-specific conditions of the project area, the SWPPP for this project will generally include limiting soil disturbances during the winter rainfall season of October 15 through April 15 and fully stabilizing disturbed areas prior to December 1. Standard sediment erosion control measures, such as silt fencing, straw bale barriers, sediment traps, or other measures could also directly reduce the off-site transport of sediment from disturbed slopes. Existing vegetation that can be preserved will be identified and flagged or fenced to avoid disturbance. Erosion in disturbed areas will be controlled through the use of grading operations that eliminate direct routes for conveying runoff to drainage channels and use of soil stabilization BMPs, such as mulching, erosion control fabrics, and/or reseeding with grass or other plants where necessary.

BIOLOGICAL OPINION FOR THE VALLEY ELDERBERRY LONGHORN BEETLE**Project Description**

A general summary of the proposed project is provided on page 3 of this biological opinion. There are 70 elderberry shrubs (*Sambucus* sp.), the sole host plant for the valley elderberry longhorn beetle, located within the proposed project area that will be affected by the proposed project. Direct impacts will occur to 70 of the shrubs and they would require transplanting. Typically, stems larger than 1.0 inch in diameter at ground level are utilized by the beetle to complete its life cycle. The 70 shrubs that will be affected have a combined total of 262 stems greater than 1.0 inch in diameter at ground level.

Proposed Conservation Measures

The project applicant has proposed the following conservation measures to offset adverse effects to the shrubs:

1. Prior to any ground disturbing activities associated with the proposed project, the 70 elderberry shrubs located onsite will be transplanted to a Service-approved location in accordance with the Service's *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* dated July 9, 1999.
2. The created beetle habitat will be monitored in accordance with the Beetle Conservation Guidelines.
3. Prior to any ground disturbing activities associated with the proposed project and per the Beetle Conservation Guidelines, the project applicant will plant 449 elderberry shrub seedlings and 495 associated riparian native species at a Service-approved valley elderberry longhorn beetle preserve. This will require 94.4-acre of habitat.

Action Area

The action area is defined in 50 CFR § 402.02 as, "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action." For the Panattoni Business Park project, this includes the entire 53-acre proposed project site.

Status of the Species/Environmental Baseline

Valley Elderberry Longhorn Beetle

The beetle was listed as a threatened species under the Act on August 8, 1980 (45 FR 52803). Critical habitat for the species was designated and published in 50 CFR §17.95. Two areas along the American River in the Sacramento metropolitan area have been designated as critical habitat for the beetle. The first area designated as critical habitat for this species is along the lower American River at Goethe and Ancil Hoffman parks (American River Parkway Zone) and the second area is at the Sacramento Zone, an area about a half mile from the American River downstream from the American River Parkway Zone. In addition, an area along Putah Creek, Solano County, and the area west of Nimbus Dam along the American River Parkway, Sacramento County, are considered essential habitat, according to *The Valley Elderberry Longhorn Beetle Recovery Plan* (Service 1984). These critical habitat areas and essential habitat areas within the American River parkway and Putah Creek support large numbers of mature elderberry shrubs with extensive evidence of use by the beetle.

The beetle depends on its host plant, the elderberry shrub. Elderberries are locally common components of the remaining riparian forest and savannah landscapes, and to a lesser extent the mixed chaparral-foothill woodlands, of the Central Valley. Use of elderberry shrubs plants by the beetle, a wood borer, is rarely apparent. Frequently, the only exterior evidence of the shrub's use by the beetle is an exit hole created by the larva emerging just prior to the pupal stage. Observations of elderberry shrubs along the Cosumnes River and in the Folsom Lake area indicate that larval beetles can be found in elderberry stems with no apparent exit holes; the

larvae either succumb prior to constructing an exit hole or not developed sufficiently to construct one. Larvae appear to be distributed in stems which are 1.0 inch or greater in diameter at ground level and can occur within both living and dead stems. *The Valley Elderberry Longhorn Beetle Recovery Plan* (Service 1984) and Barr (1991) further describe the beetle's life history.

Population densities of the beetle are probably naturally low (Service 1984); and it has been suggested, based on the spatial distribution of occupied shrubs (Barr 1991), that the beetle is a poor disperser (Collinge *et al.* 2001). Low density and limited dispersal capability cause the beetle to be vulnerable to the negative effects of the isolation of small subpopulations due to habitat fragmentation.

When the beetle was listed in 1980, the species was known from less than ten localities along the American River, the Merced River, and Putah Creek. By the time the *Valley Elderberry Longhorn Beetle Recovery Plan* was prepared in 1984, additional occupied localities had been found along the American River and Putah Creek. As of 2005, the California Natural Diversity Database (CNDDDB) contained 190 occurrences for this species in 44 drainages throughout the Central Valley, from a location along the Sacramento River in Shasta County, southward to an area along Caliente Creek in Kern County (CNDDDB 2005). The beetle continues to be threatened by habitat loss and fragmentation, predation by the non-native Argentine ants (*Linepithema humile*) (Holway 1998; Huxel 2000; Huxel and Hastings 1999; Huxel *et al.* 2001; Ward 1987), and possibly other factors such as pesticide drift, non-native plant invasion, improper burning regimes, off-road vehicle use, rip-rap bank protection projects, wood cutting, and over-grazing by livestock (CNDDDB 2005).

Direct spraying with pesticides and related pesticide drift is a potentially harmful factor for the beetle. A wide range of such spraying is done to control mosquitoes, crop diseases, and undesirable plants and insects. Although there have been no studies specifically focusing on the direct and indirect effects of pesticides on the beetle, evidence suggests that the species may be adversely affected by some pesticide applications. As of 1980, the prevalent land-use adjacent to riparian habitat in the Sacramento Valley was agriculture, even in regions where agriculture was historically not generally the most common land use (Katibah *et al.* 1984), therefore the species is likely vulnerable to pesticide contamination from an array of agricultural pesticide application practices. Recent studies of major rivers and streams documented that 96 percent of all fish, 100 percent of all surface water samples and 33 percent of major aquifers contained one or more pesticides at detectable levels (Gilliom 1999). Pesticides were identified as one of the 15 leading causes of impairment for streams included on the Clean Water Act section 303(d) lists of impaired waters. Because the beetle occurs primarily in riparian habitat, the contamination of rivers and streams likely has affects on this species and its habitat. Pesticides have been identified as one of a number of potential causes of the decline of pollinator species and the decline of other insects beneficial to agriculture (Ingraham *et al.* 1996). Therefore, it is likely that the beetle has been adversely affected by the use of pesticides on agricultural lands. Competition from invasive exotic plants, such as giant reed (*Arundo donax*), also negatively affects riparian habitat supporting the beetle. Giant reed, a native of Asia, has become a serious problem in California riparian habitats, forming dense, homogenous stands essentially devoid of wildlife. Giant reed can grow up to 2.5 inches per day and yield 8.3 tons of oven-dry cane per

acre; it also tolerates drought, floods, and extreme temperatures, and is not significantly affected by insects, disease, herbivory, fire, or mechanical disturbance. It has an extensive root system allowing it to resprout rapidly after any disturbance and it easily out-competes native riparian vegetation. Giant reed also introduces a frequent fire cycle into the riparian ecosystem, disrupting natural riparian dynamics and eventually forming homogenous climax communities. Although giant reed has become extensively distributed throughout the Central Valley and along its waterways, the extent to which it has negatively affected elderberries and the beetle is not specifically known.

Recent evidence indicates that the invasive Argentine ant poses a risk to the long-term survival of the beetle. Surveys along Putah Creek found beetle presence where Argentine ants were not present or had recently colonized, but the beetle was absent from otherwise suitable sites where Argentine ants had become well-established (Huxel, in prep.). The Argentine ant has already negatively impacted populations of other native arthropod species (Holway 1998; Ward 1987). Predation on eggs, larvae, and pupae are the most likely impacts these ants have on the beetle. In Portugal, Argentine ants have been found to be significant egg predators on the eucalyptus borer, a cerambycid similar to the beetle. Egg predation on the beetle could lead to local extirpations, as indicated by a population viability study suggesting that egg and juvenile mortality are significant factors affecting probability of extinction for the beetle (Huxel and Collinge, in prep.). The Argentine ant has been expanding its range throughout California since its introduction around 1907, especially in riparian woodlands associated with perennial streams (Holway 1998; Ward 1987). Huxel (in prep.) concluded that, given the potential for Argentine ants to spread with the aid of human activities such as movement of plant nursery stock and agricultural products, this species may come to infest most drainages in the Central Valley along the valley floor, where the beetle is found.

Another potential factor in the beetle's decline is the effects of inappropriate levels of livestock grazing, which can result in destruction of entire elderberry plants and inhibition of elderberry regeneration. Cattle, sheep and goats readily forage on new elderberry growth, and goats will consume even decadent growth. Well-manicured stands of elderberries, such as occurs due to livestock grazing, have generally been shown to have a relative absence of beetles (Service 1984). The effects on the beetle of both grazing and exotic plant invasions are likely significantly exacerbated by the problem of habitat fragmentation of elderberries. Such fragmentation increases the edge: interior ratio of habitat patches, thereby facilitating the adverse effects of these outside influences.

Riparian forests, the primary habitat for the beetle, have been severely depleted throughout the Central Valley over the last two centuries as a result of expansive agricultural and urban development (Huxel *et al.* 2001; Katibah 1984; Roberts *et al.* 1977; Thompson 1961). Since colonization, these forests have been "...modified with a rapidity and completeness matched in few parts of the United States" (Thompson 1961). As of 1849, the rivers and larger streams of the Central Valley were largely undisturbed. They supported continuous bands of riparian woodland four to five miles in width along some major drainages, such as the lower Sacramento River, and generally about two miles wide along the lesser streams (Thompson 1961). Most of the riverine floodplains supported riparian vegetation to about the 100-year flood line

(Katibah 1984). A large human population influx occurred after 1849, however, and much of the Central Valley riparian habitat was rapidly converted to agriculture and used as a source of wood for fuel and construction to serve a wide area (Thompson 1961). By as early as 1868, riparian woodland had been severely affected in the Central Valley, as evidenced by the following excerpt:

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

The clearing of riparian forests for fuel and construction made this land available for agriculture (Thompson 1961). Natural levees bordering the rivers, once supporting vast tracts of riparian habitat, became prime agricultural land (Thompson 1961). As agriculture expanded in the Central Valley, needs for increased water supply and flood protection spurred water development and reclamation projects. Artificial levees, river channelization, dam building, water diversion, and heavy groundwater pumping further reduced riparian habitat to small, isolated fragments (Katibah 1984). In recent decades, these riparian areas have continued to decline as a result of ongoing agricultural conversion as well as urban development and stream channelization. As of 1989, there were over 100 dams within the Central Valley drainage basin, as well as thousands of miles of water delivery canals and streambank flood control projects for irrigation, municipal and industrial water supplies, hydroelectric power, flood control, navigation, and recreation (Frayer *et al.* 1989). Riparian forests in the Central Valley have dwindled to discontinuous strips of widths currently measurable in yards rather than miles.

Some accounts state that the Sacramento Valley supported approximately 775,000 to 800,000 acres of riparian forest as of approximately 1848, just prior to statehood (Smith 1977; Katibah 1984). No comparable estimates are available for the San Joaquin Valley. Based on early soil maps, however, more than 921,000 acres of riparian habitat are believed to have been present throughout the Central Valley under pre-settlement conditions (Huxel *et al.* 2001; Katibah 1984). Another source estimates that of approximately five million acres of wetlands in the Central Valley in the 1850s, approximately 1,600,000 acres were riparian wetlands (Warner and Hendrix 1985; Frayer *et al.* 1989).

Based on a California Department of Fish and Game riparian vegetation distribution map, by 1979, there were approximately 102,000 acres of riparian vegetation remaining in the Central Valley. This represents a decline in acreage of approximately 89 percent as of 1979 (Katibah 1984). More extreme figures were given by Frayer *et al.* (1989), who reported that woody riparian forests in the Central Valley had declined to 34,600 acres by the mid-1980s (from 65,400 acres in 1939). Although these studies have differing findings in terms of the number of acres lost (most likely explained by differing methodologies), they attest to a dramatic historic loss of riparian habitat in the Central Valley. As there is no reason to believe that riparian habitat suitable to the beetle (elderberry shrubs) would be destroyed at a different rate than other riparian habitat, we can assume that the rate of loss for beetle habitat in riparian areas has been equally

dramatic.

A number of studies have focused on riparian vegetation losses along the Sacramento River, which supports some of the densest known populations of the beetle. Approximately 98 percent of the middle Sacramento River's historic riparian vegetation was believed to have been extirpated by 1977 (Department of Water Resources 1979). The State Department of Water Resources (DWR) estimated that native riparian habitat along the Sacramento River from Redding to Colusa decreased by 34 percent, from 27,720 acres to 18,360 acres, between 1952 and 1972 (McGill 1975; Conrad *et al.* 1977). The average rate of riparian loss on the middle Sacramento River was 430 acres per year from 1952 to 1972, and 410 acres per year from 1972 to 1977. In 1987, riparian areas as large as 180 acres were observed converted to orchards along this River (McCarten and Patterson 1987).

Barr (1991) examined 79 sites in the Central Valley supporting valley elderberry longhorn beetle habitat. When 72 of these sites were re-examined by researchers in 1997, seven no longer supported valley elderberry longhorn beetle habitat. This loss represents a decrease in the number of sites with valley elderberry longhorn beetle habitat by approximately nine percent in six years.

No comparable information exists on the historic loss of non-riparian valley elderberry longhorn beetle habitat such as elderberry savanna and other vegetation communities where elderberry shrubs also occur (oak or mixed chaparral-woodland, or grasslands adjacent to riparian habitat). However, all natural habitats throughout the Central Valley have been heavily adversely affected within the last 200 years (Thompson 1961), and we can therefore assume that non-riparian beetle habitat also has suffered a widespread decline. This analysis focuses on loss of riparian habitat because the beetle is primarily dependent upon riparian habitat. Adjacent upland areas are also likely to be important for the species (Huxel 2000), but this upland habitat typically consist of oak woodland or elderberry savanna bordering willow riparian habitat (Barr 1991). The riparian acreage figures given by Frayer *et al.* (1989) and Katibah (1984) included oak woodlands concentrated along major drainages in the Central Valley, and therefore probably included lands we would classify as upland habitat for the beetle adjacent to riparian drainages.

While habitat loss is clearly a large factor leading to the species' decline, other factors are likely to pose significant threats to the long term survival of the beetle. Only approximately 20 percent of riparian sites with elderberry observed by Barr (1991) and Collinge *et al.* (2001) support beetle populations (Barr 1991, Collinge *et al.* 2001). Jones and Stokes (1988) found 65 percent of 4,800 riparian acres on the Sacramento River have evidence of beetle presence. The fact that a large percentage of apparently suitable habitat is unoccupied suggests that the beetle is limited by factors other than habitat availability, such as habitat quality or limited dispersal ability.

Destruction of riparian habitat in central California has resulted not only in a significant acreage loss, but also has resulted in beetle habitat fragmentation. Fahrig (1997) states that habitat fragmentation is only important for habitats that have suffered greater than 80 percent loss. Riparian habitat in the Central Valley, which has experienced greater than 90 percent loss by most estimates, would meet this criterion as habitat vulnerable to effects of fragmentation.

Existing data suggests that beetle populations, specifically, are affected by habitat fragmentation. Barr (1991) found that small, isolated habitat remnants were less likely to be occupied by beetles than larger patches, indicating that valley elderberry longhorn beetle subpopulations are extirpated from small habitat fragments. Barr (1991) and Collinge *et al.* (2001) consistently found valley elderberry longhorn beetle exit holes occurring in clumps of elderberry bushes rather than isolated bushes, suggesting that isolated shrubs do not typically provide long-term viable habitat for this species.

Habitat fragmentation can be an important factor contributing to species declines because: (1) it divides a large population into two or more small populations that become more vulnerable to direct loss, inbreeding depression, genetic drift, and other problems associated with small populations; (2) it limits a species' potential for dispersal and colonization; and (3) it makes habitat more vulnerable to outside influences by increasing the edge:interior ratio (Primack 1998).

Small, isolated subpopulations are susceptible to extirpation from random demographic, environmental, and/or genetic events (Shaffer 1981; Lande 1988; Lande 1993; Primack 1998). While a large area may support a single large population, the smaller subpopulations that result from habitat fragmentation may not be large enough to persist over a long time period. As a population becomes smaller, it tends to lose genetic variability through genetic drift, leading to inbreeding depression and a lack of adaptive flexibility. Smaller populations also become more vulnerable to random fluctuations in reproductive and mortality rates, and are more likely to be extirpated by random environmental factors.

The beetle is a specialist on elderberry plants, and tends to have small population sizes and occurs in low densities (Barr 1991; Collinge *et al.* 2001). Collinge *et al.* (2001) compared resource use and density of exit holes between the beetle and a related subspecies, the California elderberry longhorn beetle (*Desmocerus californicus californicus*). The valley elderberry longhorn beetle tended to occur in areas with higher elderberry densities, but had lower exit hole densities than the California elderberry longhorn beetle. With extensive riparian habitat loss and fragmentation, these naturally-small valley elderberry longhorn beetle populations are broken into even smaller, isolated populations. Once a small valley elderberry longhorn beetle population has been extirpated from an isolated habitat patch, the species may be unable to re-colonize this patch if it is unable to disperse from nearby occupied habitat. Insects with limited dispersal and colonization abilities may persist better in large habitat patches than small patches because small fragments may be insufficient to maintain viable populations and the insects may be unable to disperse to more suitable habitat (Collinge 1996).

Studies suggest that the beetle is unable to re-colonize drainages where the species has been extirpated, because of its limited dispersal ability (Barr 1991; Collinge *et al.* 2001). Huxel and Hastings (1999) used computer simulations of colonization and extinction patterns based on differing dispersal distances, and found that the short dispersal simulations best matched the 1997 census data in terms of site occupancy. This suggests that dispersal and colonization are limited to nearby sites. At spatial scales greater than 6.2 miles, such as across drainages, valley elderberry longhorn beetle occupancy appears to be strongly influenced by regional extinction

and colonization processes, and colonization is constrained by limited dispersal (Collinge *et al.* 2001; Huxel and Hastings 1999). Except for one occasion, drainages examined by Barr that were occupied in 1991 remained occupied in 1997 (Collinge *et al.* 2001; Huxel and Hastings 1999). The one exception was Stoney Creek, which was occupied in 1991 but not in 1997. All drainages found by Barr (1991) to be unoccupied in 1991 were also unoccupied in 1997. This data suggests that drainages unoccupied by the valley elderberry longhorn beetle remain so.

Habitat fragmentation not only isolates small populations, but also increases the interface between habitat and urban or agricultural land, increasing negative edge effects such as the invasion of non-native species (Huxel *et al.* 2001; Huxel 2000; Soule 1990) and pesticide contamination (Barr 1991). Several edge effect-related factors may be related to the decline of the beetle.

Elderberry shrubs with stems 1.0 inch or greater in diameter that provide suitable habitat are found in and adjacent to the action area. The action area contains habitat components that can be used by the listed animal for feeding, resting, mating, and other essential behaviors. Several of the elderberry shrubs on the proposed project site contain exit holes from the beetle, indicating presence at one time of this species on the proposed project area. Therefore, the Service believes that the valley elderberry longhorn beetle is reasonably certain to occur within the action area because of the biology and ecology of the animal, the presence of suitable habitat in and adjacent to the action area, as well as the recent observation of exit holes from this listed species.

Effects of the Proposed Action

The proposed project will result adverse effects to a total of 262 elderberry stems at least 1 inch in diameter at ground level contained within 70 elderberry shrubs, found on the proposed Panattoni Business Park Project area, and to any valley elderberry longhorn beetle larvae contained therein. The affected shrubs are located in riparian and non-riparian habitat, and all 70 shrubs will need to be transplanted.

Direct Effects

Direct effects to the beetle will occur from the removal and transplanting of 70 shrubs, consisting of 262 stems during construction of the proposed project (Table 1).

Table 1: Proposed compensation ratios for the valley elderberry longhorn beetle for the Panattoni Business Park Project.

Habitat	Stem Diameter	# of Stems	Exit Holes	Elderberry Seedling Ratio	Associated Native Plant Ratio	Total Seedling	Total Native Plants
Riparian	stems 1" to 3"	36	No	2:1	1:1	72	72
		2	Yes	4:1	2:1	8	16
Riparian	stems 3" to 5"	10	No	3:1	1:1	30	30
		1	Yes	6:1	2:1	6	12
Riparian	stems >5"	2	No	4:1	1:1	8	8
		0	Yes	8:1	2:1	0	0
Non-Riparian	stems 1" to 3"	135	No	1:1	1:1	135	135
		4	Yes	2:1	2:1	8	16
Non-Riparian	stems 3" to 5"	40	No	2:1	1:1	80	80
		6	Yes	4:1	2:1	24	48
Non-Riparian	stems >5"	26	No	3:1	1:1	78	78
		0	Yes	6:1	2:1	0	0
Totals		262				449	495

Cumulative Effects

Cumulative effects include the effects of future State, Tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed project are not considered in this section, because they require separate consultation pursuant to section 7 of the Act. A number of other projects in the vicinity of Folsom/Sacramento are also proposed. This continued human population growth in the greater Sacramento area and throughout the Central Valley of California is expected to drive further development of agriculture, cities, industry, transportation, and water resources in the foreseeable future. Within the context of urban growth within this region, the project contributes, to a limited extent, to cumulative impacts. Some of these future activities will not be subject to Federal jurisdiction (and thus are considered to enter into cumulative effects), and are likely to result in loss of habitat for these four listed species occur.

Conclusion

After reviewing the current status of the valley elderberry longhorn beetle, as well as the

environmental baselines for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the proposed project is not likely to jeopardize the continued existence of this listed species. Critical habitat has been designated for the valley elderberry longhorn beetle; however, no critical habitat units for this species are located in the action area, and therefore, critical habitat for this species will not be affected.

INCIDENTAL TAKE STATEMENT

Section 9(a)(1) of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened fish and wildlife species without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are non-discretionary, and must be implemented by the agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this incidental take statement. If the Corps (1) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Amount or Extent of Take

The Service anticipates incidental take of the beetle will be difficult to measure because it is difficult to determine the number of beetle larvae and pupae contained within each elderberry plant. Because it is not known how many larvae or pupae each stem one inch or greater in diameter at ground level can support, the Service quantifies the amount of incidental take of the beetle in terms of the number of plants or stems one inch or greater in diameter at ground level that would be lost.

The Service anticipates that all beetles inhabiting the 262 elderberry stems measuring one inch or greater in diameter at ground level, on 70 elderberry shrubs will be harmed, harassed, or killed, as a result of the proposed action. The incidental take associated with the proposed action on the beetle is hereby exempted from prohibitions of take under section 9 of the Act.

Effect of the Take

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

Reasonable and Prudent Measures

The following reasonable and prudent measures are necessary and appropriate to minimize the adverse effects of the project on the valley elderberry longhorn beetle:

1. The effects to the valley elderberry longhorn beetle resulting from habitat modification and habitat loss shall be minimized.
2. The effects to the valley elderberry longhorn beetle from project construction shall be minimized.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Corps must comply with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

The following terms and conditions implement Reasonable and Prudent Measures numbers one (1) and two (2):

- a. The procedures outlined in the Service's *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* dated July 9, 1999, shall be followed for all actions related to the proposed project unless otherwise stated below.
- b. The applicant shall minimize the potential for incidental take of the beetle resulting from the project related activities by implementation of the conservation measures as described in the environmental assessment and the project description of this biological opinion.
- c. The project applicant shall include a copy of this biological opinion with the solicitations for design and construction of the proposed project. The prime contractor shall be responsible for implementing all requirements and obligations included within the biological opinion, and for educating and informing all other contractors involved in the project as to the requirements of the biological opinion. A copy of the solicitations containing the biological opinion also will be provided to the Chief of Endangered Species (Central Valley) at the Sacramento Fish and Wildlife Office.

- d. The project applicant shall adhere to the reporting requirements as described below in this biological opinion.
- e. Pruning and transplanting of elderberry shrubs shall be conducted between November and the first two weeks of February.
- f. A qualified biologist shall be on-site during all initial ground disturbing activities whenever take of the valley elderberry longhorn beetle may occur, as determined by the project applicant's lead biologist. The lead biologist shall have the authority to halt construction if necessary.
- g. The applicant shall purchase credits at a Service approved bank sufficient to establish 449 seedlings/cuttings and 495 associated native plants.
- h. Work crews and contractors will be given environmental awareness training that will emphasize the identification of elderberry shrubs and the need to avoid damaging the elderberry shrubs and the possible penalties of non-compliance.
- i. No insecticide, herbicides, fertilizers, or other chemicals that might harm the elderberry shrub or the beetle will be used within 100 feet of any elderberry shrub.

Reporting Requirements

The Corps must require the applicant to report to the Service immediately any information about take or suspected take of federally-listed species not authorized in this opinion. The Sacramento Fish and Wildlife Office is to be notified within one working day of the finding of any dead federally-listed species or any unanticipated harm to the species addressed in this biological opinion. The Service contact person for this is the Chief of Endangered Species Division (Central Valley) at (916) 414-6600 and the Resident Agent-in-Charge of the Service's Law Enforcement Division at (916) 414-6660. Any contractor or employee who during routine operations and maintenance activities inadvertently kills or injures a listed wildlife species must immediately report the incident to their representative superintendent or biologist. This representative superintendent or biologist must contact the California Department of Fish and Game immediately in the case of a dead or injured listed species. The California Department of Fish and Game contact for immediate assistance is State Dispatch at (916) 445-0045.

Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities that can be implemented to further the purposes of the Act, such as preservation of endangered species habitat, implementation of recovery actions, or development of information and data bases.

1. The Corps should work with the Service to address significant, unavoidable environmental impacts to federally-listed species approved by local agencies.
2. The Corps should assist the Service in the implementation of recovery efforts for the beetle.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION—CLOSING STATEMENT

This concludes formal consultation on the proposed Panattoni Business Park project. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

Please contact Michelle Tovar or the acting Sacramento Valley Branch Chief of my staff at (916) 414-6645 if you have questions regarding the proposed Panattoni Business Park project.

Sincerely,



Kenneth D. Sanchez
Acting Field Supervisor

cc:

Craig Hiatt, ECORP Consulting, Inc, Rocklin, California

Jim Jeary, Panattoni Development Company, LLC, Sacramento, California

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