



# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

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Sacramento, California 95825-1846

In reply refer to:  
1-1-05-F-0016

SEP 09 2005

To: Refuge Manager, Sacramento National Wildlife Refuge Complex  
Willows, California

From: <sup>fn</sup> Acting Field Supervisor, Sacramento Fish and Wildlife Office  
Sacramento, California *Chf Noyano*

Subject: Intra-Agency Formal Consultation on the Memorandum of Understanding between the U.S. Fish and Wildlife Service, California Department of Fish and Game, and California Department of Parks and Recreation for Riparian Restoration and Management in Glenn, Tehama, Butte, and Colusa Counties, California

This document has been prepared in response to your October 8, 2004, request to initiate formal consultation with the U.S. Fish and Wildlife Service (Service) on the effects on federally-listed species from the proposed updating of the Memorandum of Understanding (MOU) between the Service, the California Department of Fish and Game (CDFG), and the California Department of Parks and Recreation (State Parks). The updating would include the addition of specific language covering limits of liabilities covered by the MOU. In addition, this biological opinion analyzes effects of projects that are covered by the MOU, including the Sacramento River and Feather River Wildlife Areas, and the O'Connor Lakes Unit Riparian Restoration Project (proposed project) within the Feather River Wildlife Area in Sutter County, California. At issue are adverse effects of the proposed project on the threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) (beetle). Your request was received by the Sacramento Fish and Wildlife Office on October 8, 2004. This document is in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act) and in accordance with the regulations governing intra-agency consultation (50 CFR §402).

This consultation is based on: (1) the October 8, 2004, draft *Memorandum of Understanding between the U.S. Fish and Wildlife Service Regarding the Sacramento River National Wildlife Refuge, the California Department of Fish and Game Regarding the Sacramento River Wildlife Area and Feather River Wildlife Area, and the California Department of Parks and Recreation, Northern Buttes District, regarding the Sacramento River State Parks*; (2) the August 18, 2004, draft *O'Connor Lakes Unit Riparian Restoration Plan, Feather River Wildlife Area, Sutter County, California*, prepared by River Partners for the CDFG; (3) the July 2004 *Hydraulic*

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*Analysis of the O'Connor Lakes Restoration Project*, prepared by MBK Engineers; (4) the December 13, 2004, *O'Connor Lakes Unit of the Feather River Wildlife Area Elderberry Shrub Survey*, prepared by CDFG; (5) the December 9, 2004, and January 19, 2005, electronic mail correspondences from Michele Ng of the California Department of Water Resources (DWR) to Rick Kuyper of the Service regarding proposed conservation measures and maintenance activities; (6) the 2004 *Description of Proposed Work, Riparian Restoration Project, Feather River Wildlife Area, O'Connor Lakes Unit*, prepared by River Partners; (7) elderberry shrub survey information from the O'Connor Lakes area provided by CDFG to the Service on January 11, 2005; (8) the April 13, 2005, electronic mail correspondence from Armand Gonzales of CDFG to Rick Kuyper of the Service regarding the proposed project description and comments from DWR, the Reclamation Board, and River Partners; (9) the June 2005 *Hydraulic Analysis of the O'Connor Lakes Restoration Project*, prepared by MBK Engineers; (10) the August 30, 2005, electronic mail correspondence from Michele Ng of DWR to Rick Kuyper of the Service which provided final comments regarding the draft biological opinion and a request for the Service to issue the biological opinion; and (10) other information available to the Service.

Based on our analysis, the Service has determined the proposed project will result in the establishment of a significant amount of habitat for the valley elderberry longhorn beetle that will be of long-term benefit to this listed animal, and any adverse effects will be temporary and relatively minor in nature.

### **Consultation History**

October 8, 2004. The Service's Sacramento Office received the request for formal section 7 consultation from the Sacramento National Wildlife Refuge.

December 9, 2004. Michele Ng of DWR sent an electronic mail correspondence to Rick Kuyper of the Service regarding proposed maintenance activities for the proposed project.

January 11, 2005. A meeting was attended by Chris Nagano and Rick Kuyper of the Service, Michele Ng, Armand Gonzales and Dale Whitman of CDFG, and John Carlon of River Partners.

January 19, 2005. Michele Ng sent an electronic mail correspondence to Rick Kuyper regarding proposed conservation measures for the proposed project.

February 7, 2005. John Carlon provided the July 2004 *Hydraulic Analysis of the O'Connor Lakes Restoration Project* to the Service.

February 23, 2005. Rick Kuyper sent a draft copy of the project description via electronic mail correspondence to Armand Gonzales, Michele Ng, and John Carlon and requested comments and edits.

April 1 and April 8, 2005. Two meetings via telephone conference call was attended by Rick Kuyper, Armand Gonzales, Michele Ng, Stephen Bradley of the Reclamation Board, and John Carlon.

April 13, 2005. Armand Gonzales sent an electronic mail correspondence to Rick Kuyper with the compiled comments and edits of the project description from himself, Michele Ng, Stephen Bradley, and John Carlon.

May 16, 2005. Rick Kuyper sent a draft copy of the this biological opinion for review to Armand Gonzales, Michele Ng, Stephen Bradley, and John Carlon.

August 30, 2005. Michele Ng provided final comments on the draft biological opinion to Rick Kuyper and requested that the biological opinion be issued.

## **Project Description**

### Memorandum of Understanding

A memorandum of understanding (MOU) was issued in 2004 between the Service, CDFG, and State Parks regarding land management issues at selected locations including all lands owned and managed as the Sacramento River National Wildlife Refuge, Sacramento River Wildlife Area, Feather River Wildlife Area, and State Parks located along the Sacramento and Feather Rivers in Tehama, Butte, Glenn, Colusa Sutter and Yuba counties, California. The purpose of the MOU is to formally document an agreement to mutually manage, monitor, restore, and enhance lands managed for fish, wildlife, and plants along the Sacramento and Feather River, and to enhance communication between the agencies to prevent duplicating or prescribing conflicting land management and acquisition efforts. This BO applies to activities undertaken directly by the agencies that are signatories to the MOU and by their agents, that is, individuals, agencies, or organizations such as DWR and Levee District 1 that are engaged in site management or maintenance activities on behalf of and/or under the jurisdiction of one of the signatory agencies.

If this BO terminates, or if consultation related to this BO is reinitiated, DWR shall have the right to restore the site to baseline elderberry (*Sambucus* sp.) population reflective of pre-project conditions within one year of MOU termination or modification, or BO termination or reinitiation; 130 elderberry shrubs with stems greater than 1 inch in diameter that do not interfere with the flood conveyance capacity would be identified and allowed to remain. All other elderberries may be removed from the project site.

### O'Connor Lakes Unit Restoration Project

The proposed 471-acre project site is located along the Feather River at river mile 18, approximately six miles south of Yuba City in Sutter County. It is directly south of the Star Bend section of the Feather River and north of the O'Connor Lakes section. The proposed project site is part of the Feather River Wildlife Area and is currently owned and managed by CDFG. Currently, there are approximately 130 elderberry shrubs (*Sambucus* sp.) within the

proposed project site. The majority of the shrubs are located along both sides of the road along the Feather River. Elderberry shrubs are the sole host plant for the beetle, and stems 1.0 inch or greater in diameter at ground level are required for the beetle to complete its life cycle.

The proposed-project site has been disturbed by human activities for the past 100 years, and currently contains large amounts of non-native and invasive plants. The CDFG has identified the site as a high priority for restoration because it would link two adjacent tracks of existing riparian habitat, thus creating a 2,142 acre-block of contiguous riparian habitat. The goals of the proposed project include: (1) the maintenance of general flood conveyance patterns across the proposed project site; (2) removal of existing non-native invasive plant species; (3) planting of appropriate native riparian vegetation using local seed sources; and (4) preservation of existing wildlife habitat.

#### Description of Proposed Maintenance and Routine Flood Control Maintenance Activities Within the Feather River Wildlife Area

Periodic maintenance is conducted by DWR on and adjacent to the site, in the Lake of the Woods and O'Conner Lake Areas. In the Lake of the Woods area, routine maintenance consists of selectively clearing vegetation and debris in a 330 acre area. Maintenance is performed by hand crews in densely vegetated areas, and maintenance using heavy equipment is used to manage grasses, woody growth, shrubs, and select trees. Mowing is a preferred maintenance activity; however, periodically sites require leveling achieved through disking and/or dozing. Cleared areas are also sometimes sprayed as part of ongoing management. Non-native vegetation (e.g. giant reed, false bamboo, Chinese tallow, red sesbania, Spanish bloom, tree-of-heaven, black locust, tree tobacco, castor bean, pampas grass, eucalyptus, tamarisk, and acacia) would be removed. In all areas, routine maintenance includes removing vegetative material, living and dead, which interferes with the successful execution, functioning maintenance, or operation of the adopted plan of flood control. Floodwater conveyance capacity must meet the minimum flows specified in the U.S. Army Corps of Engineers (Corps) Operation and Maintenance Manual, which at this location is specified to be 300,000 cubic feet per second (cfs) with three feet of freeboard. Cleared trees, debris, brush, and trimmings are to be completely burned or removed from the floodway prior to flood season that extends from November 1 to April 15.

Routine maintenance in the O'Conner Lake area consists of clearing access and perimeter roads by clearing brush and small trees, and re-grading the roads. For the O'Connor Lakes area, a minimum 400-foot wide strip would be converted to and maintained as grasslands. This strip would be established parallel to the river as much as possible and would be cleared of woody vegetation to facilitate floodwater conveyance. Again, minimum conveyance capacity as specified in the Corps Operation and Maintenance Manual would be met as currently specified or as the Manual might be modified in the future, to protect public safety.

The Reclamation District performs levee maintenance, which includes mowing, cutting, burning, or spraying herbicides on weeds, grasses, shrubs and woody growth on levees as required to conduct levee safety inspections. Other maintenance activities include grading levee slopes to smooth surface irregularities, repair of the levee toe road, extermination of rodents (e.g. ground squirrels) burrowing in the levees, and filling of burrows with earthen materials or grout.

### Description of Riparian Restoration of the O'Connor Lakes Unit

River Partners has identified a 228-acre portion of the proposed project area as an appropriate location for the planting of native riparian species, including elderberry shrubs. When elderberries are allowed by The Reclamation Board, elderberry shrubs would comprise 10 percent of the planted species composition. Elderberry shrubs would be planted at a density of 20 plants per acre, totaling approximately 1,366 planted elderberry shrubs within the 228-acre site. All of the woody trees and shrubs would be planted in rows that would be oriented approximately north-northwest to south-southeast, which would be parallel to flood flows. This orientation would serve to direct flood flows away from the west project levee. All rows would be spaced 20 feet apart.

The restoration area would be monitored and monitoring reports would be prepared by River Partners staff, who would make monthly activity reports throughout the year, and an annual quantitative survey would be performed between June and August. Towards the end of the growing season, monthly reports and the annual monitoring results would be summarized and reviewed at a meeting on the project site. Recommendations for changes in field management would be reported in a memo prepared at the end of the growing season. In addition, pre-and-post-planting photographs would be taken annually to provide qualitative information on vegetation changes at the restoration site. A final field report would be submitted to the Service in 2007.

### Conservation Measures for the O'Connor Lakes Unit

The following measures would be taken by DWR to minimize adverse effects to the valley elderberry longhorn beetle during flood control and maintenance activities:

1. Prior to beginning maintenance work in an area where the beetle might occur, DWR maintenance supervisors and crews would be trained by a qualified biologist to identify and avoid harm to the species and its habitat.
2. Vegetation control through selective herbicide spraying in areas excluding levee slopes would be restricted to glycoposphate (Roundup) herbicide. The glycoposphate applications would occur only during appropriate weather conditions and with spray equipment that minimizes drift. Every effort would be made to insure that no glycoposphate herbicide is applied to elderberry shrub foliage.
3. Vegetation control under the dripline would be done using mowers and using hand crews July 1 through March 1.
4. Vegetation control using heavy equipment would occur up to the dripline of elderberry shrubs. Heavy equipment work would be further restricted to periods of dry weather, and DWR would suspend any ongoing maintenance work and would implement erosion control measures prior to any storm event to avoid adverse effects to elderberry shrubs.

5. Elderberry shrubs may be removed if they are located within the minimum 400-foot wide strip to be maintained free of woody vegetation needed to improve the hydraulic capacity of the area; or if the shrub interferes with flow and sediment transport, or flood control maintenance practices. Elderberry shrubs may also be removed if the floodwater conveyance capacity of the site falls below the minimum specified in the Corps Operation and Maintenance Manual as such manual exists on the date of this biological opinion or as it may be modified in the future to ensure public safety from flooding. In such cases, every effort would be made to implement recommendations from resource agency personnel regarding methods used to achieve public safety (adequate floodwater conveyance capacity) goals. The intent of this cooperation is to collaboratively address issues related to species recovery and public safety in a balanced fashion.
6. If transplanting an elderberry shrub becomes necessary because it is an impediment to flood control and/or maintenance activities, DWR would notify the Service and transplant the shrub(s) between November 1 and February 14. If removal of the shrub is required outside of these dates, it would be done in a manner to optimize survivorship of the shrub in consultation with the Service. In order to create dispersal corridors for the beetle, elderberry shrubs would be transplanted to a location that is within 50 feet of another elderberry shrub with stems measuring greater than 1.0 inch in diameter at ground level.

### Status of the Species

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 at 50 CFR §17.95. Two areas along the American River in the Sacramento metropolitan area have been designated as critical habitat for the beetle. Critical habitat for this species has been designated along the lower American River at Goethe and Ancil Hoffman parks (American River Parkway Zone) and 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 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 is dependent on the elderberry, its host plant, which is a locally common component of the remaining riparian forests and savannah areas and, to a lesser extent, the mixed chaparral-foothill woodlands of the Central Valley. Use of the elderberry shrubs by the animal, a wood borer, is rarely apparent. In most cases, the only exterior evidence of the shrub's use by the beetle is an exit hole created by the larva just prior to the pupal stage. Observations made within elderberry shrubs along the Cosumnes River, in the Folsom Lake area, and near Blue Ravine in Folsom indicate that larval galleries can be found in elderberry stems with no evidence of exit holes; the larvae either succumb prior to constructing an exit hole or are not far enough along in

the developmental process to construct an exit hole. Beetle larvae appear to be distributed in stems which are 1.0 inch or greater in diameter at ground level. The Valley Elderberry Longhorn Beetle Recovery Plan (Service 1984) and Barr (1991) contain further details on the valley elderberry longhorn beetle's life history.

Population densities of the beetle are probably naturally low (Service 1984). 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 as threatened 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 2005) 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; 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).

### **Environmental Baseline**

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 (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 land available for agriculture (Thompson 1977). 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 (Framer *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 (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 (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 (DWR 1979). The State Department of Water Resources estimated that native riparian habitat along the Sacramento River from Redding to Colusa decreased from

27,720 acres to 18,360 acres (34 percent) 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, but this upland habitat typically consists 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.

Between 1980 and 1995, the human population in the Central Valley grew by 50 percent, while the rest of California grew by 37 percent. The Central Valley's population was 4.7 million by 1999, and it is expected to more than double by 2040. The American Farmland Trust estimates that by 2040, more than 1 million cultivated acres will be lost and 2.5 million more put at risk (Ritter 2000). With this growing population in the Central Valley, increased development pressure is likely to result in continuing loss of riparian habitat.

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. Local populations of organisms often undergo periodic colonization and extinction, while the metapopulation (set of spatially separated groups of a species) may persist (Collinge 1996).

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 and pesticide contamination (Barr 1991). Several edge effect-related factors may be related to the decline of the valley elderberry longhorn beetle.

Evidence of the beetle in the form of exit holes have been found within the proposed action area. Elderberry shrubs with stems one inch or greater in diameter that provide suitable habitat are found in and adjacent to the action area. The action area contains components that can be used by the listed animal for feeding, resting, mating, and other essential behaviors. 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 recent evidence of this listed species.

#### **Project-Related Effects to the Valley Elderberry Longhorn Beetle**

The overall effect of this project will result in long-term beneficial effects to the valley elderberry longhorn beetle. The project will restore 228 acres of habitat for the imperiled animal. This addition of habitat in the area will benefit the listed beetle by increasing population numbers and improving the dispersal abilities of the species. The proposed project may result in short-term adverse effects to the valley elderberry longhorn beetle. Maintenance and operations activities and potential flood-fighting activities may remove elderberry shrubs from the proposed action area.

Indirect effects may occur if maintenance and flood-fighting activities alter the terrain, such as driplines, which may adversely affect elderberry bushes. Vehicles and construction equipment may leak hazardous substances such as motor oil and antifreeze. Although the quantity leaked by a given vehicle or engine may be minute, these substances can accumulate on roads or in parking lots and then get washed into the adjacent environment by runoff during rain storms. A variety of substances could be introduced during accidental spills of materials.

Based on our analysis, the Service has determined the proposed project will result in the establishment of a significant amount of habitat for the valley elderberry longhorn beetle that will be of long-term benefit to this listed animal, and any adverse effects will be temporary and relatively minor in nature.

## **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. An undetermined number of future land use conversions and routine agricultural practices are not subject to Federal authorization or funding and may alter the habitat or increase incidental take of the beetle and are, therefore, cumulative to the proposed project. Most of these future non-Federal projects are considered indirect effects of the proposed action and effects are addressed through an interim process of project approval and habitat conservation plan development.

Many activities affecting the beetle involve effects to elderberry shrubs located within riparian ecosystems adjoining or within jurisdictional wetlands. These projects will be evaluated via formal consultation between the Service and the Corps via the Federal nexus provided by section 404 of the Clean Water Act. However, a number of projects exist for which there is no need to discharge dredged or fill material into waters of the U.S. These projects, for which no section 404 permit is required, may lack a Federal nexus and thus, move forward absent formal consultation. These projects pose a significant threat to the recovery of the valley elderberry longhorn beetle. This loss of habitat negatively affects the environmental baseline and is difficult to quantify.

## **Conclusion**

After reviewing the current status of the beetle, the environmental baseline for the action area, the effects of the proposed project, and the cumulative effects, it is the Service's biological opinion that the project, as proposed, is not likely to jeopardize the continued existence of the beetle. Critical habitat has been designated for the beetle. However, this action does not directly or indirectly affect these areas, and therefore, no destruction or adverse modification of critical habitat is anticipated.

## **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, respectively, 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 Service 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 Service has a continuing duty to regulate the activity covered by this incidental take statement. If the Service (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 valley elderberry longhorn beetle will be difficult to detect or quantify. The cryptic nature of these species and their relatively small body size make the finding of a dead specimen unlikely. The species occur in habitats that make them difficult to detect. Due to the difficulty in quantifying the number of beetles that will be taken as a result of the proposed action, the Service is quantifying take in terms of the number of elderberry shrubs with stems one inch or greater in diameter that will become unsuitable for beetles due to direct or indirect effects as a result of the action. The Service anticipates that all valley elderberry longhorn beetles inhabiting elderberry bushes within the 471 acre project site will be taken as a result of the proposed project.

Upon implementation of the following reasonable and prudent measures, incidental take associated with the project on the listed valley elderberry longhorn beetle, in the form of harm, harassment, injury, or mortality from habitat loss or direct mortality will become exempt from the prohibitions described under section 9 of the Act for direct and indirect effects. In addition, incidental take in the form of harm, harassment, or mortality associated with the proposed project will be exempt from the prohibitions described 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 or result in destruction or adverse modification of critical habitat for the valley elderberry longhorn beetle.

#### **Reasonable and Prudent Measure**

The proposed action contains all of the measures needed to adequately minimize the effects of anticipated take on the beetle. For that reason, the Service has no Reasonable and Prudent Measures.

### **Reporting Requirements**

The Sacramento Fish and Wildlife Office is to be notified within one working day of the finding of any listed species or any unanticipated take of species addressed in this biological opinion. The Service contact persons for this are the Deputy Assistant Field Supervisor of the Endangered Species program at (916) 414-6600, and the Resident Agent-in-Charge of the Service's Law Enforcement Division at (916) 414-6660.

Any dead or severely injured beetles found (adults, pupae, or larvae) shall be given to the Service's Law Enforcement Division. All observations of valley elderberry longhorn beetles - live, injured, or dead - or fresh beetle exit holes shall be recorded on California Natural Diversity Data Base (CNDDDB) field sheets and sent to California Department of Fish and Game, Wildlife Habitat Data Analysis Branch, 1807 13<sup>th</sup> Street Room 2002, Sacramento, California 95814.

### **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 Sacramento River National Wildlife Refuge should continue to protect and restore riparian and wetland habitats in the Sacramento River basin to increase habitat for the valley elderberry longhorn beetle.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting federally-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 Sacramento River Wildlife Area and the Feather River Wildlife Area and O'Connor Lakes Unit Riparian Restoration Plan 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 Rick Kuyper or Chris Nagano at (916) 414-6645 if you have any questions or comments regarding this intra-agency biological opinion on the Sacramento River Wildlife Area and the Feather River Wildlife Area and O'Connor Lakes Unit Riparian Restoration Plan Project.

cc:

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David Walker, California Department of Fish and Game, Red Bluff, California  
Michele Ng, California Department of Water Resources, Sacramento, California  
Woody Elliot, California Department of Parks and Recreation, Oroville, California  
Stephen Bradley, The Reclamation Board, Sacramento, California  
John Carlon, River Partners, Chico, California

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