United States Department of the Interior

FISH AND WILDLIFE SERVICE
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Sacramento, California 95825-1846

In Reply Refer To:
81420-2008-F-1958-3

MAY 3 2011

Memorandum

To: Susan K. Moore, Field Supervisor, Sacramento Fish and Wildlife Office, Sacramento, California

From: Kenneth D. Sanchez, Assistant Field Supervisor, Endangered Species Program, Sacramento Fish and Wildlife Field Office, Sacramento, California

Subject: Biological Opinion on Service Approval of the City of Roseville Open Space Preserve Overarching Management Plan in Placer County, California

This memorandum is in response to the April 9, 2010, request for formal intra-Service consultation on the U.S. Fish and Wildlife Service's (Service) approval of the City of Roseville Open Space Preserve Overarching Management Plan (proposed project or Plan) in Placer County, California. Additional information necessary for the consultation was received from the City of Roseville (City) (project applicant) on November 5, 2010, January 21, 2011, and March 8, 2011. At issue are the potential effects of the proposed project on the endangered vernal pool tadpole shrimp (*Lepidurus packardi*), the threatened vernal pool fairy shrimp (*Branchinecta lynchi*), the endangered Conservancy fairy shrimp (*Branchinecta conservatio*), and the threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphhus*) (beetle). You requested concurrence that the project is likely to adversely affect the vernal pool fairy shrimp, vernal pool tadpole shrimp, and the beetle, and concurrence that the project is not likely to adversely affect the endangered Conservancy fairy shrimp (*Branchinecta conservatio*). The proposed project is not located in critical habitat for any federally listed species; therefore none will be affected. This response is issued under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act), and is in accordance with the regulations governing intra-Service consultations (50 CFR §402).

This biological opinion is based on: (1) various drafts and revisions of the City of Roseville Open Space Preserve Overarching Management Plan; (2) various emails, meetings, and site visits between the Service, the U.S. Army Corps of Engineers (Corps), and the City; and (3) other information available to the Service.

The Service concurs that the proposed project is not likely to adversely affect the Conservancy shrimp based on the lack of suitable habitat in the action area and the low probability of the

species being present. The Service concurs that the proposed project is likely to adversely affect the vernal pool fairy shrimp and the vernal pool tadpole shrimp (collectively, vernal pool crustaceans), and the beetle. Therefore, this document represents the Service's biological opinion on the effects of the proposed project on the vernal pool crustaceans and the beetle in accordance with the Act.

Consultation History

In August 18, 2000, the City entered into a Memorandum of Understanding (MOU) (Appendix 1 in Plan) with the Service. Development of the MOU was a Proposed Conservation Measure in the *Review of the Pleasant Grove Wastewater Treatment Plant Project, Placer County, California* (Service File 1-1-99-F-0006) in order to obligate the Service and the City to work toward a mutually agreeable conservation program that would minimize adverse effects to federally listed species due to future development within the jurisdiction of that City that is serviced by the Pleasant Grove Wastewater Treatment Plant (PGWTP). Additionally, the MOU required that the City work with the Service to develop a long-term habitat conservation plan (HCP) or an equivalent document to minimize the future adverse effects to federally listed species in areas served by the Phase 2 operations of the PGWTP. An interim strategy was developed, and it was ultimately decided by the Service and the City that an HCP was not needed. However, the Service requested that the City develop a plan to standardize the monitoring and management of its system of vernal pool and wetland preserves in an overarching management plan. The City has requested that the Service and the Corps review this Plan. In order to be in compliance with the Act and receive exemption from the prohibitions of section 9 of the Act, the City requested that the Service perform an intra-Service consultation on the approval this Plan: this consultation is on the Service's approval of that proposed Plan.

BIOLOGICAL OPINION

Description of Proposed Action

The City's Open Space system consists of 34 City-owned Open Space Preserves (1,992 acres; Figure 1, Appendix A) and 12 primarily City-owned General Open Space areas (532 acres; Figure 2), totaling approximately 2,524 acres. Open Space Preserves are lands that were required to be preserved as part of a regulatory action (i.e., a biological opinion, a Corps permit) and are typically protected by a Conservation Easement or Declaration of Covenants and Restrictions. The Open Space Preserves are primarily vernal pool grassland or riparian corridors. Approximately 776 acres of the Open Space Preserves are within the Western Placer County core area of the Southeastern Sacramento Valley Vernal Pool Region. The General Open Space areas are lands set aside due to City policy or to meet Specific Plan or General Plan requirements. The Open Space Preserves and General Open Space areas are collectively referred to as Open Space.

Since the 1990s, the City has managed its Open Space Preserves according to individual operation and management plans. While this approach was reasonable when only a few Open Space Preserves existed, the number of preserves has steadily increased over the last decade.

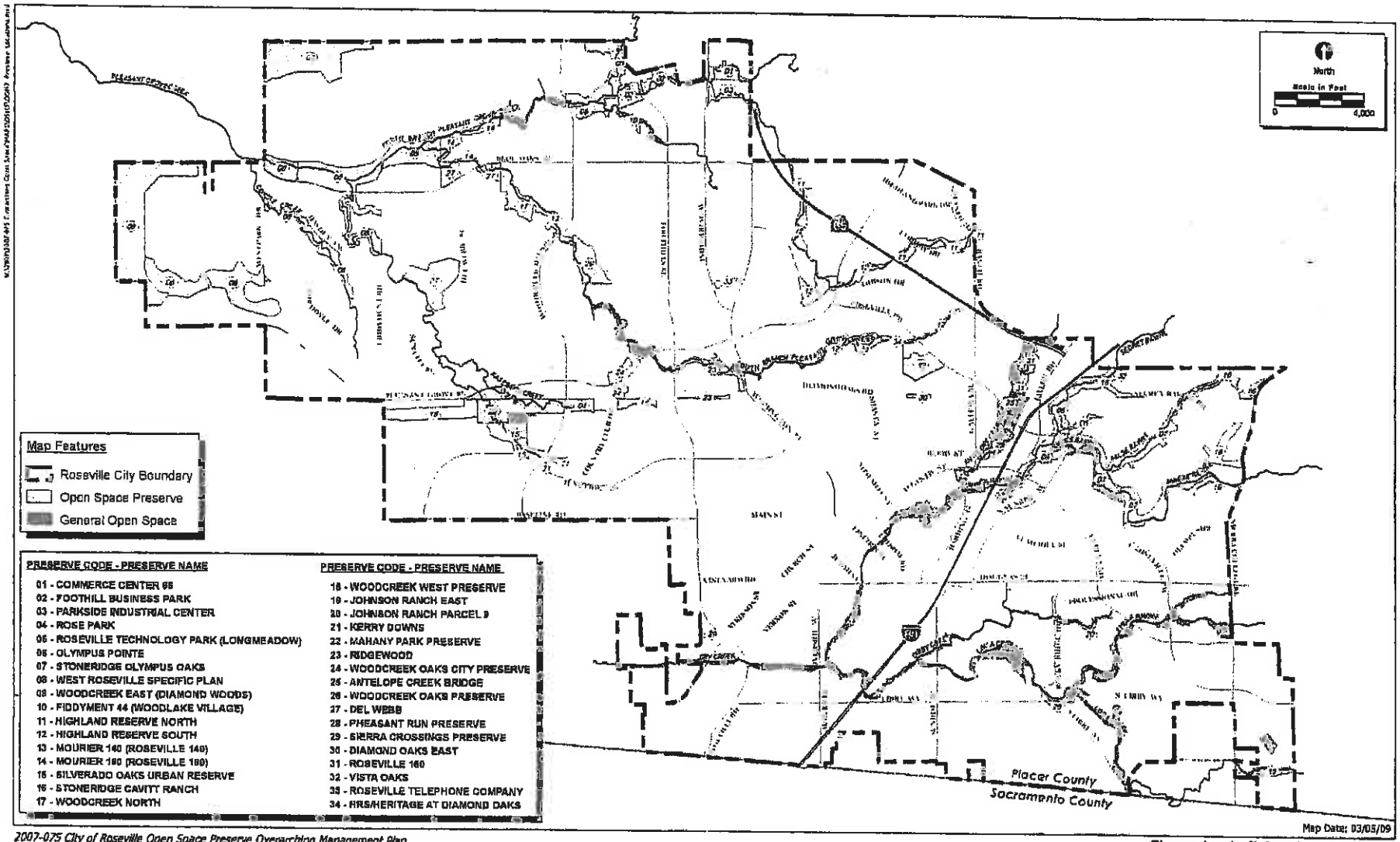

Figure 1 Individual Open Space Preserve Locations

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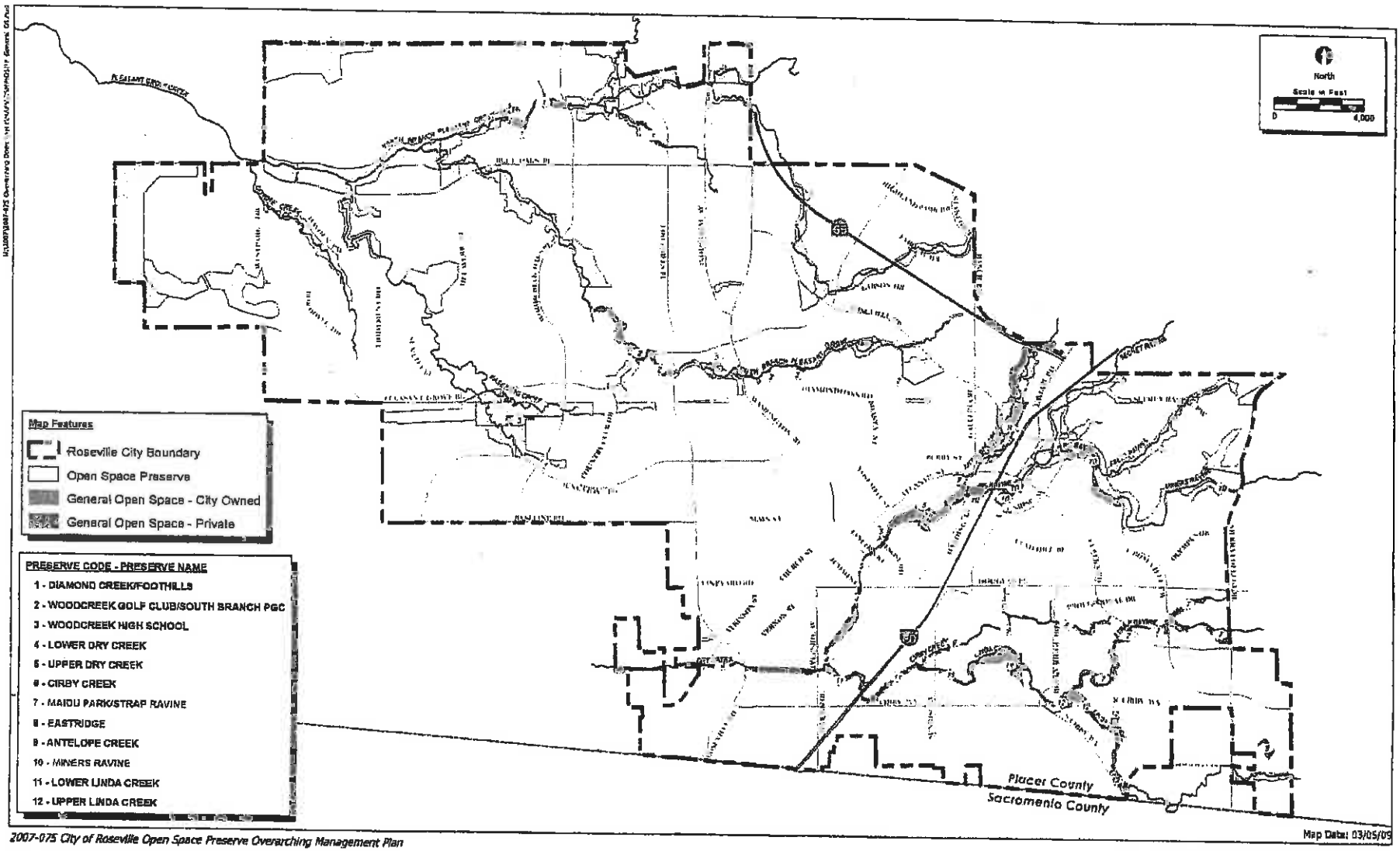

Figure 2 General Open Space

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Because the Open Space Preserves were established at different times, the individual management plans are different. Development of this Plan is an effort to update and standardize management practices. Ultimately, the City would like to manage the City-owned General Open Space areas in a manner similar to Open Space Preserves; however, there is currently limited funding for that level of management, monitoring, and maintenance. The Plan is intended to be the guiding document for the management of both existing Open Space and future Open Space dedicated through the development process or through habitat conservation efforts. The purpose of the Plan is:

1. To provide a City-wide approach to Open Space management, maintenance, and monitoring.
2. To provide specific goals for Open Space management, maintenance, and monitoring.
3. To consolidate existing Open Space Preserve monitoring and reporting requirements to allow for more comprehensive data gathering and preparation of a single annual monitoring report.
4. To consolidate existing Operation and Management Plans, and update the approved list of allowed uses of Open Space Preserve areas.
5. To eliminate the need for additional management plans when new open space is dedicated through the development process or habitat conservation efforts.
6. To gain approval of necessary open space management and maintenance tasks that may adversely affect federally listed species protected by the Act.
7. To reduce agency and City staff workload by providing an agreed-upon method for corrective actions.
8. To provide a platform for grant funding.

The Plan includes template deed restrictions that will be placed on Open Space Preserves. General Open Space does not have deed restrictions or conservation easements, but are zoned as open space by the City and are typically within a floodplain.

The Plan includes criteria for inclusion of Open Space Preserves and General Open Space established in the future. In order to include new Open Space Preserves or new General Open Space as part of this biological opinion, the City will submit a request for inclusion to the Service which includes, at a minimum: the location of the new area; a map of the new area; the acreage of vernal pool crustaceans within the new area; information on the presence of elderberry shrubs within the new area; any documentation of listed species within the new area; a commitment that the new area will be managed in accordance with the Plan, and the Service File Number of any associated biological opinion. This biological opinion will be reinitiatied for the inclusion of the new area.

The Plan includes monitoring and surveying of habitat and species. For vernal pool crustaceans, this involves selecting 10 percent of the vernal pools within the Preserves for annual sampling; a minimum of five vernal pools will be sampled in each Preserve area. Approximately one-half of the sampled pools will be natural and half will be created. The same group of vernal pools will be sampled every year, although they will be reviewed on an annual basis to determine if there is a reason to change which pools are being sampled. The goal is to increase sampling to 20

percent of pools, which will require additional funding. As additional funding becomes available, more monitoring will be added such as: additional pools will be surveyed for vernal pool crustaceans; special-status plant surveys will be conducted; and beetle surveys will be conducted. Surveys will be conducted by individuals with a valid 10(a)1(A) permit with approval from the Service to perform the survey.

The Plan allows the City to conduct activities related to existing City facilities and habitat restoration on the Open Space covered by the Plan that are likely to adversely affect the beetle, vernal pool fairy shrimp, and vernal pool tadpole shrimp. Activities related to City facilities includes, but is not limited to, working on bike trails and maintenance roads, detention and retention structures, water quality features, outfalls and inlets, bridges and culverts, water lines, sewer lines, natural gas lines, electrical poles and towers, fiber optic lines, telephone poles/lines, stream gauges, and cell phone towers. Examples of restoration activities are restoring vernal pools impacted by illegal off-road vehicle use or dirt-bike jumps. The City accepts fee title to Preserves after the appropriate agencies have given final approval of the success of created habitat; however, occasionally monitoring may indicate that a created wetland has poor function. Poorly functioning created wetlands are those that are not inundated for a period sufficient, either too long or too short of an inundation period, to support appropriate vernal pool or seasonal wetland plant compositions. When budget is available, the City may undertake remediation of these poorly-functioning wetlands. This may include revegetation of pools after altered hydrology is corrected, making the wetland basins deeper, or creating wetland swales to allow overflow from other wetlands to augment direct precipitation. Appendix B outlines where each of these activities are covered in the Plan in detail and outlines which conservation measures listed below apply to each activity. The City will limit these activities to the following:

Vernal Pool Crustaceans

Primary impacts for the restoration of up to 8 acres of vernal pool fairy shrimp and vernal pool tadpole shrimp habitat for the lifetime of this biological opinion, with a maximum of 2 acres in any one year, including:

- Minor grading (using a skip loader or asphalt floater) or hand work required to restore or remediate habitat resulting from human disturbance, emergency firebreaks, altered hydrology, sedimentation, or poor function (created habitat only).
- Mowing and vacuuming no more than 25% of the total area of any selected vernal pool for material to act as inoculum used in revegetating restored pools.

Secondary impacts of up to 6 acres of vernal pool fairy shrimp and vernal pool tadpole shrimp habitat for the lifetime of this biological opinion, with a maximum of 3 acres in any one year, for City facility maintenance, replacement, or modification that causes ground disturbance within 250 feet of vernal pool habitat (e.g., replacement of a utility pole). This does not apply to the installation of new City facilities which will be addressed in a separate consultation.

Valley Elderberry Longhorn Beetle

Trimming of up to 100 shrubs for the lifetime of this biological opinion, with a maximum of 10 elderberry shrubs in any one year, for Open Space and City facility maintenance and replacement purposes and restoration projects under the Plan. No more than 80 stems will be trimmed per year on the 10 shrubs, not to exceed the size classes below:

- 50 stems measuring between one and three inches in diameter at ground level.
- 20 stems between three inches and five inches in diameter at ground level.
- 10 stems five inches in diameter or greater at ground level.

No more than half of an elderberry shrub can be removed by combining the allowed stem removals. Stems under one inch in diameter at ground level are not considered beetle habitat and may be trimmed in any number, but only as needed to meet the purpose of the maintenance or restoration project.

Indirect impacts of up to an additional 200 shrubs, with a maximum of 20 elderberry shrubs in any one year, for City facility maintenance, replacement, or modification, that causes ground disturbance within 100 feet of an elderberry shrub. This does not apply to the installation of new City facilities, although such facilities maybe addressed in a separate biological opinion.

Additionally, the Plan includes detailed plans for a bike trail bridge at Highlands Reserve South and effects of the bridge on vernal pool fairy shrimp and vernal pool tadpole shrimp are analyzed in this biological opinion. The bridge will consist of an 89-foot rail-car bridge decking placed on two concrete abutments, which cross a portion of the easterly section of an unnamed tributary to Pleasant Grove Creek. Permanent rock rip-rap will be placed around the concrete abutments. Equipment used will be excavators, backhoes, front loaders, compactors, bulldozer, cranes, water trucks, concrete trucks, and paving and striping equipment. Construction will occur within 3 to 15 feet of two pools which are 0.013 and 0.047 acres (total of 0.06 acre).

The Plan also includes many activities which are not likely to adversely affect listed species based on the descriptions in the Plan and the proposed conservation measures outlined below. Some of these activities overlap with the facility maintenance activities discussed above; for those activities, the location of the proposed action relative to vernal pool habitat (within 250 feet) or elderberry shrubs (within 100 feet) distinguishes if each activity is likely or not likely to adversely affect the species. These activities are: mechanical vegetation management; vegetation management by grazing; vegetation management with pesticides; vegetation management as it relates to outfall, drainage, culvert, and bridge maintenance; tree maintenance and removal; biological monitoring (except for surveys requiring a 10(a)1(A) permit); restoration or correction of vandalism outside of vernal pools; native tree planting; education activities; beaver management; trash removal; fence, gate, bollard, and signage maintenance and replacement; bike trail maintenance and replacement; erosion control; firebreaks; and water quality feature (detention or stormwater basin) maintenance. Appendix C outlines where each of these activities are covered in the Plan in detail and outlines which conservation measures listed below apply to each activity.

The Plan includes actions that are conceptually proposed (e.g., bike trails), but not enough detail is known at the current time to evaluate effects. Plan approval recognizes these conceptual uses as future allowed uses within the Preserve areas identified, but this does not negate the need for consultation with the Service on activities that may adversely affect listed species, with the exception of those specifically addressed in this biological opinion.

A single comprehensive Annual Report addressing the status of the City's Open Space system will be provided to the Service. It will include at a minimum: a map of the City's Open Space Preserve system; representative photos; a description of proposed activities and maintenance or management actions required by the Plan; a description of actions for which Corps and Service notification or approval was not needed, but were carried out during the year; a summary of all take of federally listed species (authorized and/or unauthorized) that occurred during the monitoring year as a result of management actions; observations from the various general and biological inspections/surveys; and recommendations for altered management practices as needed.

Conservation Measures

The conservation measures as proposed below are considered part of the proposed action evaluated by the Service in this biological opinion. Conservation measures will be implemented as appropriate for each activity. Appendices B and C outline which conservation measure applies to each activity.

General Conservation Measures

1. **Exclusion Zone Fencing/Flagging:** The City will mark the boundaries of environmentally sensitive exclusion zones and sensitive habitat features that are to be avoided (wetlands, vernal pools, elderberry shrubs, etc.) with highly visible flagging or fencing to prevent impacts from vehicles. All maintenance personnel will be required to conduct work activities within the defined area only.

2. **Work Zone:** Heavy equipment, vehicles, and maintenance work will be confined to existing or designated access roads, road shoulders, and disturbed or designated areas. Ground disturbance and vegetation removal will be confined to the minimum extent necessary to complete the work.

3. **Maintenance Monitoring:** The City will retain a Service-approved biologist(s) or trained City staff member to be on-site during maintenance activities that will result in direct impacts to species or their habitat.

4. **Erosion and Dust Control:** The City will implement erosion, sediment, material stockpile, and dust control best management practices to minimize the potential for fill or runoff to enter wetlands or waterways. A biological monitor will be retained as necessary to monitor and inspect the installation and removal of erosion/sediment control devices if applicable.

5. **Spill Prevention/Containment and Refueling Precautions:** The City will maintain all maintenance equipment to prevent leaks of fuels, lubricants, or other fluids into waterways. Appropriate materials will be on-site to prevent and manage accidental spills. The City will take appropriate precaution when handling and/or storing chemicals (e.g., fuel and hydraulic fluid) near waterways and wetlands, and any and all applicable laws and regulations will be followed. Service and refueling procedures will take place outside open space areas or at least 100 feet from waterways or in an upland area at least 100 feet from wetland boundaries to prevent spills from entering waterways or wetlands.

6. **Trash Cleanup:** The City will properly contain and remove all trash and waste items generated by maintenance activities.

7. **Post-Maintenance Clean-up:** Following maintenance, each maintenance site will be returned to as good or better condition as it was prior to maintenance, including removal of all maintenance debris.

8. **Staging Areas:** The City will locate all staging areas a minimum of 250 feet from elderberry shrubs and from vernal pool crustacean habitat.

Vernal Pool Crustacean Conservation Measures

9. **Work Window:** The City will perform ground disturbing work within 250 feet of vernal pool habitat or work that will result in direct or indirect impacts authorized by this biological opinion only during the dry season (roughly, May 15–October 15).

10. **Worker Awareness Training:** A Service-approved biologist or trained City staff member will brief maintenance crews about the status of listed vernal pool crustaceans and the need to protect the wetlands they inhabit, including the possible penalties for not complying with these requirements. The briefing will include instruction on how to identify vernal pools and other seasonal wetlands that may provide habitat.

11. **Maintenance Access:** The City will avoid driving equipment through vernal pools or other wetland habitat while accessing the Open Space for maintenance activities and will stay on bike trials/maintenance roads whenever possible.

Valley Elderberry Longhorn Beetle Conservation Measures

12. **Pre-Maintenance Surveys:** The City will conduct pre-maintenance surveys for elderberry shrubs prior to the start of maintenance in order to know where shrubs are located and properly implement the measures below or track adverse effects to the beetle.

13. **Worker Awareness Training:** A Service-approved biologist or trained City staff member will brief work crews about the status of the beetle and the need to protect its elderberry host

plant, including the possible penalties for not complying with these requirements. The briefing will include instruction on how to identify the shrub.

14. **Elderberry Shrub Avoidance:** Where feasible, within maintenance areas the City will maintain a 100-foot buffer around existing elderberry shrubs with stems over 1 inch in diameter at ground height.

15. **Elderberry Trimming:** If possible, leave any trimmed elderberry stems greater than one inch in diameter close to the trimmed shrub rather than removing them from the site. Trimming of elderberry shrubs will be done between November and mid-February, the shrub's dormant period, when possible. Elderberries will not be trimmed during the beetle's emergent period, March 15 through June 15.

16. **Maintenance Near/Trimming Elderberry Shrubs:** A buffer of 100 feet surrounding elderberry shrubs will be established whenever possible during maintenance activities. In areas where maintenance will take place within 100 feet of an elderberry shrub, erosion control and revegetation measures will be implemented where necessary. If mowing is required to reduce fire hazard within 100 feet of an elderberry shrub, mowing activities would comply with the work window requirements of measure 17 below. Care will be taken to avoid damaging existing elderberry shrubs with mowing equipment.

17. **Work Window:** Maintenance within 100 feet of any elderberry shrubs will avoid the beetle's emergent period which is March 15 through June 15.

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 proposed action, the Service considers the action area to be the Open Space Preserves and General Open Space that the City of Roseville oversees. The Open Space Preserves and General Open Space that are covered by the Plan are distributed throughout the City and include a network of corridors that connect many of the preserves (Figures 1 and 2).

Analytical Framework for the Jeopardy Analysis

In accordance with policy and regulation, the jeopardy analysis in this biological opinion relies on four components: (1) the *Status of the Species*, which evaluates the vernal pool crustaceans' and the beetle's range-wide condition, the factors responsible for that condition, and their survival and recovery needs; (2) the *Environmental Baseline*, which evaluates the condition of the vernal pool crustaceans and the beetle in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the vernal pool crustaceans and the beetle (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the vernal pool crustaceans and the beetle; and (4) the *Cumulative Effects*, which

evaluates the effects of future, non-Federal activities in the action area on the vernal pool crustaceans and the beetle.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the vernal pool crustaceans' and the beetle's current status, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the vernal pool crustaceans and the beetle in the wild.

The jeopardy analysis in this biological opinion places an emphasis on consideration of the range-wide survival and recovery needs of the vernal pool crustaceans and the beetle and the role of the action area in the survival and recovery of the vernal pool crustaceans and the beetle as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

Status of the Species

Vernal Pool Fairy Shrimp

Species Description – The vernal pool fairy shrimp was listed as threatened in 1994 (Service, 1994) (59 FR 48153). Further details on the life history and ecology of the vernal pool fairy shrimp may be found in the final listing rule, Eng *et al.* (1990), Helm (1998), Simovich et al. (1992), and Volmar (2002).

Vernal pool fairy shrimp have delicate elongate bodies; large, stalked, compound eyes; no hard shell (i.e., no carapace); and 11 pairs of swimming legs. Typically less than one inch long, fairy shrimp swim or glide upside-down using complex, beating movements of the legs. They are restricted to vernal pools (and swales), an ephemeral freshwater habitat that forms in areas with Mediterranean climates where slight depressions become seasonally saturated or inundated following fall and winter rains. Vernal pool fairy shrimp inhabit alkaline pools, ephemeral drainages, rock outcrop pools, vernal pools, and vernal swales (Eriksen and Belk 1999; Helm 1998). Occupied habitats range in size from rock outcrop pools as small as one square meter to large vernal pools up to 12 acres; the potential ponding depth of occupied habitat ranges from 1.2 inches to 48 inches (in southern California).

The geographic range of this species encompasses most of the Central Valley from Shasta County to Tulare County and the central coast range from northern Solano County to Santa Barbara County, California. Additional occurrences have been identified in western Riverside County, California, and in Jackson County, Oregon near the city of Medford (California Natural Diversity Database [CNDDB] 2008; Helm 1998; Eriksen and Belk 1999; Volmar 2002; Service 1994, 2003). The vernal pool fairy shrimp are currently known from 32 presumed populations. The number of recorded sightings of individuals has increased from 178 to over 550 (CNDDB 2008). Records include old museum records and site duplication, so the number of occurrences that are currently extant is unknown. The distribution of the shrimp remains essentially

unchanged since being listed. Known records suggest that in most locations the shrimp is frequently present only in low numbers or only present in a small percentage of the pools at a site.

Due to local topography and geology, vernal pools are usually clustered into pool complexes (Holland and Jain 1988). The genetic characteristics of the species, as well as ecological conditions, such as watershed continuity, indicate that populations of these animals are defined by pool complexes rather than by individual vernal pools (Fugate 1992). Therefore, the most accurate indication of the distribution and abundance of these species is the number of inhabited vernal pool complexes. The pools and, in some cases, pool complexes supporting these species are usually small.

Life History – Female vernal pool fairy shrimp carry eggs in a pear-shaped, ventral brood sac. The eggs are either dropped to the pool bottom or remain in the brood sac until the female dies and sinks. The "resting" or "summer" eggs are capable of withstanding heat, cold, and prolonged desiccation. When the pools fill in the same or subsequent seasons, some, but not all, of the eggs may hatch. The egg bank in the soil may consist of eggs from several years of breeding (Donald 1983). The eggs hatch when the vernal pools fill with rainwater. Vernal pool fairy shrimp develop rapidly, feeding on algae, bacteria, protozoa, rotifers, and bits of detritus, and may become sexually mature within two weeks after hatching (Gallagher 1996; Helm 1998). The adults of the vernal pool fairy shrimp have been collected from early December to early May, depending on annual weather conditions. However, these non-dormant populations often disappear early in the season long before the vernal pools dry up. Such quick maturation permits vernal pool fairy shrimp populations to persist in relatively short-lived, shallow bodies of water (Simovich et al. 1992).

Vernal pool fairy shrimp have passive dispersal. Large-scale flooding resulting from winter and spring rains may have played an important role in dispersal of the species, allowing the animals to colonize different individual vernal pools and other vernal pool complexes within a watershed. This dispersal means has been altered due to the construction of dams, levees, and other flood control measures, and widespread urbanization within significant portions of the range of this species. Waterfowl and shorebirds likely are now the primary dispersal agents for fairy shrimp (Simovich *et al.* 1992) even at a relatively local scale, and likely have always been important to long-distance dispersal. The eggs of the crustaceans are either ingested (Krapu 1974, Swanson et al. 1974, Driver 1981, Ahl 1991) and/or adhere to the legs and feathers where they are transported to new habitats.

Vernal Pool Tadpole Shrimp

Species Description – A final rule was published on September 19, 1994 (Service 1994), to list the vernal pool tadpole shrimp as endangered under the Act. Further information on the life history and ecology of the vernal pool tadpole shrimp may be found in Eng *et al.* (1990), Helm (1998), Simovich *et al.* (1992), and Volmar (2002).

Vernal pool tadpole shrimp have large, shield-like carapaces approximately one inch long that cover most of their body; dorsal, compound eyes; and a pair of long cercopods, one on each side of a flat caudal plate, at the end of their last abdominal segment. Like vernal pool fairy shrimp, vernal pool tadpole shrimp are restricted to vernal pools (and swales), an ephemeral freshwater habitat that forms in areas with Mediterranean climates where slight depressions become seasonally saturated or inundated following fall and winter rains. They have been found in vernal pools containing clear to highly turbid water and ranging in size from 5 square meters (54 square feet) in the Mather Air Force Base area of Sacramento County, to the 36-hectare (89-acre) Olcott Lake at Jepson Prairie in Solano County; the potential ponding depth of occupied habitat ranges from 1.5 inches to 59 inches. Vernal pools at Jepson Prairie and Vina Plains (Tehama Co.) have a neutral pH, and very low conductivity, total dissolved solids, and alkalinity (Barclay and Knight 1984, Eng *et al.* 1990). These pools are located most commonly in grass-bottomed swales of grasslands in old alluvial soils underlain by hardpan or in mud-bottomed claypan pools containing highly turbid water.

The vernal pool tadpole shrimp is known from 19 populations in the Central Valley, ranging from east of Redding in Shasta County south to Fresno County, and from a single vernal pool complex located on the San Francisco Bay National Wildlife Refuge in Alameda County. As with vernal pool fairy shrimp, the most accurate indication of the distribution and abundance of these species is the number of inhabited vernal pool complexes.

Life History – Females deposit cysts (partially developed embryos encased in an egg-like structure) which settle on the pool bottom. Although some cysts may hatch quickly, others remain dormant to hatch during later rainy seasons (Ahl 1991). Tadpole shrimp may become sexually mature within three to four weeks after hatching (Ahl 1991; Helm 1998). Reproductively mature adults may be present in pools until the habitats dry up in the spring (Ahl 1991; Simovich *et al.* 1992; Gallagher 1996). Vernal pool tadpole shrimp are primarily bottom-dwelling animals that move with legs down while feeding on detritus and living organisms, including fairy shrimp and other invertebrates (Pennak 1989). Vernal pool tadpole shrimp have similar dispersal methods as discussed above for vernal pool fairy shrimp.

Status and Distribution of the Vernal Pool Crustaceans – Both vernal pool crustaceans are imperiled by a variety of human-caused activities, primarily the loss and modification of habitat due to urban development, agricultural conversion, and infrastructure construction, especially along the periphery of urban areas (Service 2007a, 2007b). Habitat loss occurs from direct destruction and modification (e.g., to the hydrology) of pools due to filling, grading, disking, leveling, and other activities, as well as modification of surrounding uplands which alters vernal pool watersheds. Other activities which adversely affect these species include off-road vehicle use, certain mosquito abatement measures, and pesticide/herbicide use, alterations of vernal pool hydrology, fertilizer and pesticide contamination, invasions of aggressive non-native plants, gravel mining, and contaminated stormwater runoff.

Holland (1978) estimated that between 67 and 88 percent of the area within the Central Valley of California which once supported vernal pools had been destroyed by 1973. However, an analysis of this report by the Service revealed apparent arithmetic errors which resulted in a

determination that a historic loss between 60 and 85 percent may be more accurate. Coe (1988) estimated that within 20 years, 60 to 70 percent of the habitat would be destroyed by human activities. The rate of loss of vernal pool habitat in the state has been estimated at 2 to 3 percent per year (Holland and Jain 1988).

Between 1994 and 2005, the Service's Sacramento Fish and Wildlife Office engaged in section 7 consultations for projects with impacts to approximately 50,000 acres of vernal pool habitat, which includes both the vernal pools (wetland acres) and the surrounding uplands (Service 2007a). This total includes the loss of 25,000 acres of vernal pool habitat to residential, commercial, and industrial development (Service 2005).

In addition to direct habitat loss, the vernal pool habitat also has been and continues to be highly fragmented throughout their ranges due to conversion of natural habitat for urban and agricultural uses. This fragmentation results in small isolated populations. Ecological theory predicts that such populations will be highly susceptible to extirpation due to chance events, inbreeding depression, or additional environmental disturbance (Gilpin and Soule 1986, Goodman 1987a, b). Should an extirpation event occur in a population that has been fragmented, the opportunities for re-colonization would be greatly reduced due to physical (geographical) isolation from other (source) populations. Only a small proportion of the habitat of these species is protected from these threats.

The Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (Recovery Plan) provides a recovery strategy for 20 federally listed species: 10 endangered plants, 5 threatened plants, 3 endangered animals, and 2 threatened animals. The vernal pool fairy shrimp and the vernal pool tadpole shrimp are included in the Recovery Plan. The Recovery Plan presents an ecosystem-level strategy for recovery and conservation focused on habitat protection and management. As a basis, the plan uses the 17 vernal pool regions in the State of California as defined by the California Department of Fish and Game in the California Vernal Pool Assessment Preliminary Report (Keeler-Wolf *et al.* 1998). The Recovery Plan further designates core areas that are distinct areas in each vernal pool region that provide the features, populations, and distinct geographic and/or genetic diversity necessary for recovery of the species. Five year reviews were completed for both vernal pool fairy shrimp and vernal pool tadpole shrimp in 2007 (Service 2007a, 2007b). No change in status was recommended for both species.

Valley Elderberry Longhorn Beetle

Species Description – 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.

The beetle is moderate-sized (0.5 to 1 inch in length) and stout-bodied with elongated cylindrical bodies with long antennae. Males have red-orange elytra (wing covers) with four elongate spots. Females have dark colored elytra.

Life History – The elderberry shrub is the sole host plant for the valley elderberry longhorn beetle, though use of elderberry shrubs 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. It has been observed feeding upon both blue and red elderberry (Service 1984, Barr 1991) with stems greater than or equal to one inch in diameter (Barr 1991). 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 do not develop 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 in living stems. *The Valley Elderberry Longhorn Beetle Recovery Plan* (Service 1984) and Barr (1991) further describe the beetle's life history. The beetle tends to have small population sizes and occur in low densities (Barr 1991; Collinge *et al.* 2001).

Distribution and Range – 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. The occupancy rates of the beetle are reduced in non-riparian habitats (e.g., Talley *et al.* 2007), indicating that riparian elderberry habitat is an important habitat for the beetle.

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 Range wide distribution extends from the Sacramento River in Shasta County, southward to an area along Caliente Creek in Kern County (CNDDB 2006).

The beetle is considered a poor disperser based on the spatial distribution of occupied shrubs and computer simulations of colonization and extinction patterns based on differing dispersal distances (Barr 1991; Collinge *et al.* 2001). 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). This data suggests that drainages unoccupied by the beetle remain unoccupied.

Threats to the Species – 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.

Habitat destruction is one of the most significant threats to the beetle. 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 agricultural and urban development (Huxel *et al.* 2001; Katibah 1984; Roberts *et al.* 1977; Thompson 1961). Riparian forests in the Central Valley have dwindled to discontinuous strips of widths currently measurable in yards rather than miles.

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 beetle subpopulations are extirpated from small habitat fragments. Barr (1991) and Collinge *et al.* (2001) consistently found 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.

Small, isolated subpopulations are susceptible to extirpation from random demographic, environmental, and/or genetic events (Shaffer 1981; Lande 1988; Primack 1998). When a sub-population becomes extinct, habitat fragmentation reduces the chance of recolonization from any remaining populations. The effect of habitat fragmentation likely is exacerbated by the poor dispersal abilities of the beetle (Collinge *et al* 2001; Talley 2005).

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

The invasive Argentine ant (*Linepithema humile*) is a potential threat to the beetle (Huxel 2000). This ant is both an aggressive competitor and predator on native fauna that is spreading throughout riparian habitats in California and displacing assemblages of native arthropods (Ward 1987; Human and Gordon 1997; Holway 1998). A negative association between the presence of the ant and beetle exit holes was observed along Putah Creek in 1997 (Huxel 2000). This aggressive ant could interfere with adult mating or feeding behavior, or prey on eggs and larvae (e.g., Way *et al.* 1992). 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, 2000).

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.

Invasive exotic plant species may significantly alter the habitat of the beetle. Without adequate eradication and control measures, these non-native species may eliminate elderberry shrubs and other native plants.

Environmental Baseline

Vernal pool fairy shrimp and vernal pool tadpole shrimp

Status of the species within the action area - The action area is located in the Southeastern Sacramento Valley Vernal Pool Region, which contains almost 15 percent of the remaining vernal pool grasslands in the State of California (Keeler-Wolf et al. 1998). Part of the action area (766 acres) is also within the Western Placer County Core Area as designated in the

Recovery Plan (Service 2005). An "occurrence", which may represent a documented collection, observation, or museum specimen, is defined by the CNDDB as a location occupied by a species separated from other locations by at least 0.25 miles, and may contain multiple records. There are 106 occurrences of vernal pool fairy shrimp in the Southeastern Sacramento Valley Vernal Pool Region, of which 16 are within the City of Roseville (Service 2007a). There are 79 occurrences of vernal pool tadpole shrimp in the Southeastern Sacramento Valley Vernal Pool Region, of which one occurrence of vernal pool tadpole shrimp is within the City of Roseville.

The Open Space Preserves have approximately 76 acres of vernal pool habitat. Of the 34 Open Space Preserves covered by this Plan, 23 have been surveyed for crustaceans since 2002 and 11 have not been surveyed; 8 have documented occurrences of fairy shrimp and 1 has an occurrence of tadpole shrimp (Appendix D). None of the General Open Space have been surveyed for vernal pool crustaceans. The species are likely to be distributed in vernal pools throughout the action area.

Factors affecting the species within the action area – All Open Space Preserves in the action area have deed restrictions or conservation easements that protect the properties for conservation purposes and restrict development. General Open Space do not have deed restrictions or conservation easements, but are zoned as open space by the City and are typically within a floodplain and are unlikely to have any development proposed.

A bike trail was installed at Highland Reserve South without the Service being consulted; therefore the effects of that action on the vernal pool crustaceans were not analyzed. The bike trail probably secondarily impacted the habitat by reducing watersheds, increasing erosion and sedimentation due to construction, and changing water flow rates due to slope changes which likely indirectly adversely affected vernal pool crustaceans. The City shall consult with the Service on any future activities on the Open Space that may affect listed species.

Valley Elderberry Longhorn Beetle

Status of the species within the action area - There are eight occurrences of the beetle within Placer County (CNDDB 2011). No occurrences are within the action area; however, there is an occurrence less than two miles from a preserve. There are approximately 586 acres of riparian habitat within the Open Spaces that may have suitable habitat, but surveys have only been done on one Preserve (Stoneridge Cavitt Ranch). Stoneridge Cavitt Ranch was established as a compensation site for the beetle in 2003; 18 shrubs were transplanted and 849 elderberry

seedlings and associated natives were planted on the approximately 7 acre preserve. Beetle exit holes have been documented within the preserve. Additionally, there are approximately 25 additional elderberry shrubs within the Open Space.

Factors affecting the species within the action area — All Preserves in the action area have deed restrictions or conservation easements that preserve the properties for conservation purposes and restrict development. General Open Space do not have deed restrictions or conservation easements, but are zoned as open space by the City and are typically within a floodplain and are unlikely to have any development proposed. The City shall consult with the Service on any future activities on the Open Space that may affect listed species.

Effects of the Action

Vernal Pool Crustaceans

Restoration of vernal pool habitat under the Plan will cause primary impacts to up to 8 acres of listed vernal pool crustacean habitat for the lifetime of this biological opinion, with a maximum of 2 acres in any one year. Grading (using a skip loader or asphalt floater) and hand work required to restore or remediate habitat will result in the crushing of crustacean eggs. Collecting vernal pool material to serve as inoculum for restored pools will result in crushing, movement, and decreased viability of crustacean eggs. Effects due to restoration activities are ultimately expected to increase the quality and function of the vernal pool habitat and, therefore, benefit the vernal pool crustaceans.

Activities under the Plan will cause secondary impacts of up to 6 acres of listed vernal pool crustacean habitat for the lifetime of this biological opinion, with a maximum of 3 acres in any one year, due to City facility maintenance, replacement, or modification that causes ground disturbance within 250 feet of listed vernal pool crustacean habitat (e.g., replacement of a utility pole) per year. This does not include new construction. Habitat secondarily impacted includes all habitat supported by destroyed or modified upland areas, and all habitat otherwise damaged by disturbance that will be caused by the project. Ground disturbing activities in the watershed of vernal pools are expected to result in siltation when pools fill during the wet season following construction. Silt in pools supporting listed crustaceans may result in decreased cyst viability, decreased hatching success, and decreased survivorship among early life history stages, thereby reducing the number of mature adults in future wet seasons. The hydrologic regime (e.g., change in rates of surface flow, reducing subsurface volumes) of the pools is not expected to be altered because no new construction is occurring.

Activities under the Plan will cause secondary impacts to an additional 0.06 acre due to the construction of the bike trail bridge at Highlands Reserve South. Construction will occur within close proximity (3 to 15 feet) of two pools. The secondarily affected habitat will have an altered watershed and increases in siltation, erosion, and sedimentation due to these activities which will cause indirect effects to the vernal pool crustaceans. Increases in siltation, erosion, and sedimentation in pools supporting listed crustaceans may result in decreased cyst viability,

decreased hatching success, and decreased survivorship among early life history stages, thereby reducing the number of mature adults in future wet seasons.

The management, protection, and restoration of the Open Space will ultimately provide a benefit for the vernal pool crustaceans. These actions will contribute to the long-term preservation and management of the vernal pool crustaceans and their habitat that is critical for the species' survival and recovery.

Valley Elderberry Longhorn Beetle

Activities under the Plan will directly impact, due to trimming, up to 10 elderberry shrubs each year (100 shrubs over the lifetime of the biological opinion) for Open Space and City facility maintenance and replacement purposes and restoration projects under the Plan. This includes: up to 50 stems measuring between one and three inches in diameter at ground level; 20 stems between three inches and five inches in diameter at ground level; and 10 stems five inches in diameter or greater at ground level. Trimming will result in harm or harassment of the beetle in the form of habitat modification and disruption of normal behavior patterns.

Activities under the Plan will indirectly impact up to 20 shrubs per year (200 shrubs over the lifetime of the biological opinion) for City facility maintenance, replacement, or modification that causes ground disturbance within 100 feet of an elderberry shrub. Beetles inhabiting these shrubs will be affected by dust, noise, and habitat disturbance.

The management, protection, and restoration of the Open Space will ultimately provide a benefit for the beetle. These actions would contribute to the long-term preservation and management of the beetle and its habitat that is critical for the species' survival and recovery.

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.

Continued human population growth in the Roseville area is expected to drive further development of agriculture, cities, industry, transportation, and water resources in the foreseeable future. Because the action area is protected, future projects in the area do not pose a significant threat to the vernal pool crustaceans or the beetle within the action area.

Conclusion

After reviewing the current status of the vernal pool fairy shrimp, vernal pool tadpole shrimp, and the beetle, the environmental baseline for the area covered by this biological opinion, 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 the vernal pool

fairy shrimp, vernal pool tadpole shrimp, or the beetle. The Service reached this conclusion because the effects of the action would not reasonably be expected to reduce appreciably the likelihood of both the survival and recovery of the vernal pool fairy shrimp, vernal pool tadpole shrimp, or the beetle in the wild by reducing their reproduction, numbers, or distribution. Effects to the vernal pool fairy shrimp, vernal pool tadpole shrimp, and the beetle are small and spread out among Open Space Preserves and General Open Space and over time, and some effects are due to restoration activities which ultimately increase the quality and function of the vernal pool habitat. Additionally, the Open Space Preserves are protected in perpetuity which will benefit the long-term survival and recovery of the species.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to Section 4(d) of the Act prohibit the take of endangered and threatened 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 City for the exemption under 7(o)(2) to apply. The City has a continuing duty to regulate the activity that is covered by this incidental take statement. If the City: (1) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms; and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of 7(o)(2) may lapse.

Amount or Extent of Take

The Service anticipates incidental take of the vernal pool fairy shrimp and vernal pool tadpole shrimp will be difficult to detect for the following reasons: (1) these species have small body size, therefore finding a dead or injured specimen is unlikely; (2) these species occur in habitats that makes detection difficult; and (3) losses may be masked by seasonal and annual fluctuations in numbers, chance events, changes in water regime, or additional environmental disturbance. Due to the difficulties in quantifying the number of individuals that will be taken as a result of the proposed action, the Service is quantifying take incidental to the activities under the Plan as the number of acres of suitable habitat for the vernal pool fairy shrimp and vernal pool tadpole shrimp that will become unsuitable for these species as a result of the action. The Service estimates that all vernal pool fairy shrimp and vernal pool tadpole shrimp inhabiting a total of

14 acres (up to 8 acres for the lifetime of this biological opinion, with a maximum of 2 acres in any one year, due to restoration activities, and 6 acres for the lifetime of this biological opinion, with a maximum of 3 acres in any one year, due to facility maintenance) of vernal pool habitat impacted over the lifetime of the biological opinion, will be harmed, harassed, injured, or killed, as a result of the proposed action. Additionally, all vernal pool fairy shrimp and vernal pool tadpole shrimp inhabiting 0.06 acre of vernal pool habitat impacted at Highland Reserve South by construction of the bike trail bridge will be harmed, harassed, injured, or killed, as a result of the proposed action.

The Service expects that incidental take of the beetle will be difficult to detect or quantify. The cryptic nature of these species and their relatively small body size make the finding of an injured or dead specimen unlikely. The species occurs 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 incidental to the activities under the Plan as death, injury, harassment, and harm of all beetles inhabiting or otherwise utilizing the 30 elderberry shrubs (10 shrubs due to trimming, maximum of 80 stems per year, and 20 shrubs due to facility maintenance, replacement, or modification) affected annually, up to 300 shrubs over the lifetime of this biological opinion, as described in this biological opinion.

Upon implementation of the following reasonable and prudent measure, these levels of incidental take of the vernal pool crustaceans and the beetle will be 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 jeopardize the continued existence of the vernal pool crustaceans or the beetle.

Reasonable and Prudent Measures

The Service has determined that the following reasonable and prudent measure is necessary and appropriate to minimize the effects of the proposed project on the vernal pool crustaceans and the beetle:

1. All of the conservation measures as described in the project description, and as restated here in this biological opinion, must be fully implemented and adhered to.

Terms and Condition

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

1. The City shall adhere to the conservation measures described in the *Project Description* of this biological opinion.

2. The City shall provide a copy of this biological opinion and any subsequent amendments to the primary contractor and sub-contractors. The City shall clearly notify the primary contractor that he/she is 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.

3. The City shall consult with the Service on future activities that may adversely affect any listed species which are included in the Plan conceptually but not enough detail is known at the current time to evaluate effects.

Reporting Requirements

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 Deputy Assistant Field Supervisor at (916) 414-6600 and the Resident Agent-in-charge of the Service's Law Enforcement Division at (916) 414-6660.

The City must report to the Service immediately any information about take or suspected take of federally listed species not authorized in this biological opinion. Notification must include the date, time, and location of the incident or of the finding of a dead or injured animal. The Service contact is the Resident Agent-in-charge of the Service's Law Enforcement Division at (916) 414-6660.

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 to implement recovery actions, to help implement recovery plans, to develop information, or otherwise further the purposes of the Act. We propose the following conservation recommendations:

1. The City should work with the Service to implement the recovery criteria of the Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon.

2. The City should manage the Preserves covered by this Plan and other City properties, if possible, for the benefit of the vernal pool crustaceans and the beetle.

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the action outlined in the request. 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 retained (or is authorized by law) and if: (a) the

amount or extent of incidental take is exceeded; (b) 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; (c) the action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in this opinion; or (d) a new species is listed or critical habitat designated that may be affected by the action.

Please contact Lisa Ellis or Kellie Berry, Chief, Sacramento Valley Branch at (916) 414-6645 if you have questions regarding this biological opinion.

cc:
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Appendix A. Individual Open Space Preserves

Preserve Name (Map Number on Figure 1)	Preserve Acreage	Service File Number
Antelope Creek Bridge (25)*	19±	n/a
Commerce Center 65 (01)	19±	1-1-96-F-0001, 1-1-98-F-0175
Del Webb (27)	112±	n/a
Diamond Oaks East	4±	n/a
Fiddyment 44, a.k.a. Woodlake Village (10)	6±	1-1-05-F-0037
Foothill Business Park (02)	46±	n/a
Highland Reserve North (11)	43±	1-1-00-F-0016
Highland Reserve South/Heritage at Diamond Oaks (12, 34)	140±	1-1-97-F-142, 1-1-99-I-1518
Johnson Ranch East* (19)	18±	n/a
Johnson Ranch Parcel 9* (20)	7±	n/a
Kerry Downs* (21)	8±	n/a
Mahany Park* (22)	68±	n/a
Mourier 140, a.k.a. Roseville 140 (13)	13±	1-1-97-F-130
Mourier 160, a.k.a. Roseville 160 (14)	38±	1-1-99-F-0147
Olympus Oaks/Olympus Pointe/Stoneridge Cavitt Ranch/Vista Oaks (06,07, 16, 32)	301±	96-F-0066
Parkside Industrial Center (03)	37±	n/a
Pheasant Run* (28)	4±	n/a
Ridgewood* (23)	25±	n/a
Rose Park (04)	15±	1-1-04-F-0220
Roseville 150* (31)	21±	n/a
Roseville Telephone Company* (33)	5±	n/a
Roseville Technology Park, a.k.a. Longmeadow (05)	8±	1-1-98-F-0171
Sierra Crossing* (29)	2±	n/a
Silverado Oaks Urban Reserve (15)	59±	n/a
West Roseville Specific Plan (08)	737±	1-1-03-F-0013
Woodcreek East, a.k.a. Diamond Woods (09)	59±	1-1-99-F-0075
Woodcreek North (17)	45±	1-1-97-0006
Woodcreek Oaks, a.k.a. Hewlett Packard (26)	43±	1-1-96-I-1433
Woodcreek Oaks/City Preserve* (24)	20±	n/a
Woodcreek West (18)	52±	1-1-99-F-0111
TOTAL:	**1992±**	

*Does not have an operations and management plan.

Appendix B. Conservation measures to be implemented for each action likely to adversely affect listed species. Highlighted boxes indicate which conservation measure will be done for each activity.

		Conservation Measures																
Activities Likely to Adversely Affect	**Described in Plan Section(s)**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**
Vegetation Management - Trimming of Elderberry Shrubs	3.7.1																	
Restoration/Correction of Vandalism Within Vernal Pools	3.7.1																	
Bike Trail Maintenance and Replacement	3.7.1, 9.1.1																	
Utilities - Repair and Replacement	3.7.1, 9.1.6																	

Appendix C. Conservation measures to be implemented for each action not likely to adversely affect listed species. Highlighted boxes indicate which conservation measure will be done for each activity.

		Conservation Measures																
Activities Not Likely to Adversely Affect	**Described in Plan Section(s)**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**
Vegetation Management - Mechanical	7.2.2, 7.2.3, 7.3.2, 7.3.3, 7.4.2, 7.4.3, 8.2.2, 8.2.3, 8.5.1, 9.1.3, 9.1.4, Appendix 5, Appendix 25		■	■		■	■	■	■		■	■	■	■	■	■		■
Vegetation Management - Grazing	7.3.2, 8.5.3, Appendix 26								■			■						
Vegetation Management - Herbicides	3.7.1, 8.2.3, 8.5.5, Appendix 5, Appendix 25					■			■		■	■	■	■	■			
Vegetation Management - Outfall, Drainage, Culvert, and Bridge Maintenance	8.2.3, 9.1.4	■	■	■	■	■	■	■	■		■	■	■	■	■	■	■	■
Tree maintenance and removal	7.2.3, 7.4.3,		■			■	■	■	■		■	■	■	■	■	■	■	■
Biological Monitoring*	6, 8.4											■						
Restoration/Correction of Vandalism Outside of Vernal Pools	7.1.2, 7.3.1, 7.4.1, 8.3 (all)		■	■	■	■	■	■	■		■	■	■	■	■			
Native Tree Planting	7.2.1, 7.4.1, 11.0						■	■	■			■						
Educational Activities	11.0						■					■						
Beaver Management	7.2.4	■	■		■	■	■	■	■		■	■	■	■	■	■	■	■
Trash Removal	8.2.1											■						
Fence, Gate, Bollard, and Signage Maintenance and Replacement	8.2.4, 8.2.5, 8.2.6		■	■		■	■	■	■		■	■	■	■	■	■	■	■
Erosion Control	8.2.3, 8.3.6	■	■		■	■	■	■	■		■	■	■	■	■	■	■	■
Firebreaks	8.5								■		■	■	■	■	■	■	■	■
Water Quality Feature Maintenance	9.1.2, 9.1.3	■	■		■	■	■	■	■		■	■	■	■	■	■	■	■

* Vernal pool invertebrate monitoring take coverage provided by monitoring biologist's 10(a)(1)(A) permit.

Appendix D. Survey and Species Status of Open Space Preserves.

Preserve number in Figure 1	Preserve	Surveys done?	Species detected	Other documented occurrence
1	Commerce Center 65	Yes		
2	Foothill Industrial	Yes		
3	Park Side Industrial Center	No		
4	Rose Park	Yes		
5	Roseville Technology Park (Longmeadow)	Yes		
6	Olympus Pointe	Yes		
7	Stoneridge Olympus Oaks	Yes		
8	West Roseville Specific Plan	Yes	Fairy shrimp	
9	Woodcreek East (Diamond Woods)	Yes		
10	Fiddyment 44 (Woodlake Village)	Yes		
11	Highland Reserve North	Yes		
12	Highland Reserve South	Yes	Fairy shrimp	
13	Mourier 140 (Roseville 140)	Yes	Fairy shrimp	
14	Mourier 160 (Roseville 160)	Yes	Fairy shrimp	
15	Silverado Oaks Urban Reserve	Yes	Fairy shrimp	
16	Stoneridge Cavitt Ranch	No		
17	Woodcreek North	Yes	Fairy shrimp	
18	Woodcreek West	Yes	Fairy shrimp	
19	Johnson Ranch East	Yes		
20	Johnson Ranch Parcel 9	No		
21	Kerry Downs	Yes		
22	Mahany Park Preserve	Yes		
23	Ridgewood	Yes		
24	Woodland Oaks City Preserve	No		Tadpole shrimp
25	Antelope Creek Bridge	No		
26	Wood Creek Oaks Preserve	Yes		
27	Del Webb	Yes		Fairy shrimp
28	Pheasant Run Preserve	No		
29	Sierra Crossing Preserve	No		
30	Diamond Oaks East	No		
31	Roseville 150	No		
32	Vista Oaks	No		
33	Roseville Telephone	No		
34	HRS/Heritage at Diamond Oaks	Yes		