United States Department of the Interior

FISH AND WILDLIFE SERVICE
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In Reply Refer To:
81420-2010-F-0849-3

MAY 10 2013

Ms. Nancy Ward
Federal Emergency Management Agency
Department of Homeland Security
Region IX
1111 Broadway, Suite 1200
Oakland, California 94607-4052

Subject: Biological Opinion for the Proposed Federal Emergency Management Agency (FEMA) Hazardous Fire Risk Reduction Project in the East Bay Hills of Alameda and Contra Costa Counties, California (HMGP 1731-16-34, PDM-PJ-09-CA-2005-003, PDM-PJ-09-CA-2005-011, and PDM-PJ-09-CA-2006-004)

Dear Ms. Ward:

This is in response to your September 4, 2012 letter, requesting formal consultation with the U.S. Fish and Wildlife Service (Service) on the proposed FEMA Hazardous Fire Risk Reduction Project (proposed project) in the East Bay Hills of western Alameda and western Contra Costa Counties, California. Your request was received on September 5, 2012. At issue are the potential effects of the proposed project on the threatened California red-legged frog (*Rana draytonii*), threatened Alameda whipsnake (*Masticophis lateralis euryxanthus*) and its designated critical habitat, and threatened pallid manzanita (*Arctostaphylos pallida*). Critical habitat has been designated for the California red-legged frog but does not occur within the action area for the proposed project. This biological opinion is issued under the authority of the Endangered Species Act, as amended (16 U.S.C. 1531 *et seq.*) (Act).

The proposed project involves FEMA funding 4 grants for fuels and vegetation management over about a 3,373-acre area (including interconnected parcel described in the *East Bay Regional Park District Wildfire Hazard Reduction and Resource Management Plan* (WHRRMP) (LSA Associates, Inc. 2009)) along about 25 miles of the wildland-urban interface in the East Bay Hills from Lake Chabot Regional Park at the southern extent north to Point Pinole Regional Park in the City of Richmond at the northern extent. East Bay Regional Park District (EBRPD), University of California-Berkeley (UCB), and the City of Oakland (Oakland) (collectively referred to as the applicants) have applied, in a total of four applications, to FEMA, through the California Emergency Management Agency (Cal EMA), for Federal financial assistance to implement hazardous fire risk reduction projects in the East Bay Hills. The funding would be

provided under the Pre-Disaster Mitigation (PDM) Program and the Hazard Mitigation Grant Program (HMGP) for grant application numbers HMGP 1731-16-34, PDM-PJ-09-CA-2005-003, PDM-PJ-09-CA-2005-011, and PDM-PJ-09-CA-2006-004.

The goal of the proposed project is to reduce fuel loads to prevent fire hazards to property and life. Elements that would be implemented as part of the proposed project include vegetation management, various treatment methods, maintenance activities, and monitoring. Other individual projects which are adjacent to or in close proximity of the proposed project have been identified. These projects are part of the WHRRMP (LSA Associates, Inc. 2009). The WHRRMP serves as guidelines for ongoing vegetation management activities in EBRPD parklands to reduce fire risk in the East Bay Hills utilizing similar design elements as the proposed project.

EBRPD developed the WHRRMP to guide ongoing vegetation management activities on EBRPD park lands along the wildland-urban interface to reduce the likelihood of a catastrophic, wind-driven wildfire, such as the 1991 Oakland Hills fire. The WHRRMP is one of a number of EBRPD projects funded through the passing of Measure CC in Alameda and Contra Costa counties by voters that would support fuel management activities that have been ongoing for 72 years and largely funded by various fire hazard mitigation grants under FEMA.

The WHRRMP identifies over 3,000 acres of parklands to be treated for various levels of hazardous fuel conditions. The areas would be treated and maintained for a period of 5-10 years using a variation of five treatment methods: hand labor, mechanical treatment, chemical treatment, prescribed burning, and grazing. The areas that would be treated under the WHRRMP include parcels within parklands adjacent to treatment areas identified in the proposed project. Therefore, while the proposed project and the WHRRMP are designed to have independent utility, the success of the efforts for each would rely on each other. Thus, implementation of the WHRRMP is considered interrelated with or interdependent to the proposed project.

The Service concurs that the proposed project is not likely to adversely affect the endangered Presidio clarkia (*Clarkia franciscana*) based on the following: (1) the Presidio clarkia is not known to occur within the action area for the proposed project; (2) EBRPD will conduct protocol-level surveys for the Presidio clarkia prior to disturbing suitable serpentine grassland habitat for this species and will maintain a 50-foot buffer from any individual Presidio clarkia plants; (3) EBRPD will minimize the potential for the introduction of invasive plant species into suitable habitat for the Presidio clarkia by implementing a Service-approved invasive plant species control plan; and (4) the proposed project is likely to benefit the Presidio clarkia by removing shrubs and non-native trees encroaching upon suitable serpentine grassland habitat for the listed plant.

This document represents the Service's biological opinion on the effects of the proposed project on the California red-legged frog, Alameda whipsnake and its designated critical habitat, and the pallid manzanita. The following sources of information were used to develop this biological opinion: (1) the December 2012 and January 2013 (revised) *Hazardous Fire Risk Reduction Biological Assessment, East Bay Hills, California* prepared by FEMA, Oakland, California (FEMA 2012, 2013); (2) the July 2009 EBRPD WHRRMP prepared by LSA Associates, Inc.

(http://www.ebparks.org/stewardship/fuelsplan/eir, LSA Associates, Inc. 2009); (3) various discussions and correspondence among the Service, FEMA, Cal EMA, U.S. Department of Homeland Security, National Oceanic and Atmospheric Administration/National Marine Fisheries Service (NMFS), Oakland, UCB, EBRPD, URS Corporation, CDM Smith, and California Department of Fish and Wildlife (CDFW); (4) the January and February 2013 Draft Mitigation and Monitoring Plans (MMPs) prepared by each applicant (UCB 2013, Oakland 2013, and EBRPD 2013); (5) the January 2013 *Draft East Bay Regional Park District Pallid Manzanita Management Plan* prepared by ESA, Oakland, California (ESA 2013); (6) site visits to the proposed project area on February 17, 2011, March 9, 2011, and November 2, 2011; and (7) other information available to the Service.

Consultation History

June 11, 2010	The Service received from FEMA a letter requesting the Service's participation as a cooperating agency on the Environmental Impact Statement for the proposed project.
July 27, 2010	The Service sent to FEMA a letter agreeing that the Service would participate as a cooperating agency on the Environmental Impact Statement for the proposed project.
December 2010 – May 2013	The Service attended weekly conference calls and quarterly meetings with FEMA, NMFS, Oakland, UCB, EBRPD, Cal EMA, and the Department of Homeland Security discussing the proposed project.
February 17, 2011	The Service attended a site visit with FEMA, EBRPD, UCB, and URS to UCB's proposed treatment areas at Strawberry and Claremont canyons.
March 2, 2011	The Service sent a letter to FEMA commenting on the development of the Environmental Impact Statement for the proposed project.
March 9, 2011	The Service attended a site visit with FEMA, EBRPD, CDFW, and URS to some of EBRPD's proposed treatment areas.
March 16, 2011	The Service received from FEMA responses to the Service's comments on the development of the Environmental Impact Statement for the proposed project.
March 29, 2011	The Service provided FEMA comments on the Draft MMPs submitted by the applicants.
June 7, 2011	The Service attended a meeting with FEMA, the U.S. Department of Homeland Security, Cal EMA, Oakland, EBRPD, and UCB where FEMA agreed to include in the formal consultation for the proposed project the interconnected actions in the action area that will be implemented as part of the EBRPD WHRRMP (LSA Associates, Inc. 2009).

August 30, 2011	The Service provided FEMA comments on the spreadsheet developed by FEMA and URS summarizing the proposed vegetation management activities within each treatment area for the proposed project.
November 2, 2011	The Service attended a site visit with FEMA, EBRPD, CDFW, URS, and Swaim Biological, Inc. to some of EBRPD's proposed treatment areas.
July 16, 2012	The Service received from FEMA the Draft Biological Assessment for the proposed project.
September 5, 2012	The Service received from FEMA the revised Biological Assessment for the proposed project and the request to initiate formal consultation. In the letter, FEMA determined that the proposed project is likely to adversely affect California red-legged frog and Alameda whipsnake but not likely to adversely affect pallid manzanita, Presidio clarkia, or designated critical habitat for the Alameda whipsnake.
October 1, 2012	The Service submitted to FEMA via electronic mail comments on the revised Biological Assessment for the proposed project.
November 6, 2012	The Service met with FEMA, NMFS, U.S. Department of Homeland Security, CDM Smith, and the applicants to discuss the best management practices (BMPs) that would be implemented during herbicide use for the proposed project.
November 13, 2012	The Service submitted to FEMA via electronic mail comments on the applicants' revised MMPs.
November 16, 2012	The Service met with FEMA, NMFS, U.S. Department of Homeland Security, CDM Smith, and the applicants to discuss avoidance and minimization measures and compensation for the proposed project.
December 10, 2012	The Service received from FEMA the Final Biological Assessment for the proposed project. Based on comments from the Service, FEMA changed their initial determination from "not likely to adversely affect" to "likely to adversely affect" pallid manzanita and designated critical habitat for the Alameda whipsnake.
February 11, 2013	The Service received from FEMA the January 2013 revised Biological Assessment containing the revised estimates of habitat disturbance and creation in the proposed project, the revised Draft MMPs, and the Draft EBRPD Pallid Manzanita Management Plan.
April 1, 2013	The Service received from FEMA the revised estimates of habitat disturbance and creation in Oakland's proposed North Hills-Skyline project area.

BIOLOGICAL OPINION

Description of the Proposed Project

The proposed project consists of FEMA funding four grant applications submitted to Cal EMA by UCB, Oakland, and EBRPD (UCB's PDM-PJ-09-CA-2005-003, UCB's PDM-PJ-09-CA-2005-011, Oakland's PDM-PJ-09-CA-2006-004, and EBRPD's HMGP 1731-16-34). The grant applications include several vegetation management projects intended to reduce the wildfire risk to the built environment in applicant-identified areas of the East Bay Hills in the wildland-urban interface of western Alameda and Contra Costa Counties, California. The grant applications and summary of the extent of the proposed project area are summarized in Table 1 below. Maps of the proposed project areas are enclosed in Appendix A of this biological opinion.

As shown in Table 1 below, UCB's grant applications apply to Strawberry Canyon and Claremont Canyon (PDM-PJ-09-CA-2005-003 and PDM-PJ-09-CA-2005-011). Oakland's grant application (PDM-PJ-09-CA-2006-004) applies to six projects in the East Bay Hills on property owned by Oakland, UCB, and EBRPD. The projects covered by Oakland's grant include: Oakland's North Hills-Skyline Project and Caldecott Tunnel Project; UCB's Frowning Ridge Project; and EBRPD's Tilden-Grizzly Peak Boulevard (Blvd.) Project, Sibley Island Project, and Claremont Canyon-Stonewall Project. The native understory would be protected while exotic trees would be removed and the cambium and stumps of eucalyptus (*Eucalyptus* species) and acacia (*Acacia* species) would be mechanically or chemically treated with herbicide to prevent re-sprouting. Felled trees would be either: (1) chipped or lopped and scattered on the project site, and logs retained as a component of sediment/erosion control measures and to contribute to wildlife habitat and long-term soil productivity; (2) removed from the site to prevent contribution to excessive fuel buildup and future difficulty of control; or (3) combinations of these, as appropriate. Follow-up treatment of re-sprouts would be conducted annually for long-term maintenance by removing re-sprouts from the site to prevent contribution to excessive fuel buildup and future difficulty of control, or, as appropriate, combinations of these. Cut brush, tree branches, and tops may be piled for later disposal by burning under prescribed and permitted conditions. Seedlings emerging from the latent seed stock in the project area would be managed over time to prevent re-colonization of these invasive species.

UCB

UCB has two PDM grant applications included in the proposed project (PDM-PJ-09-CA-2005-11 and PDM-PJ-09-2005-003). The two grant applications would treat a project area totaling 99.2 acres including 56.43 acres at Strawberry Canyon and 42.81 acres at Claremont Canyon. In addition, UCB would treat a project area totaling 185.08 acres at Frowning Ridge using funds from Oakland's grant application (PDM-PJ-09-CA-2006-004). The project areas would be treated to remove exotic pyrophytic and invasive species (eucalyptus, pine, and French broom) to reduce fire hazard, and decrease the continuity of the fuel bed and flammability characteristics of the shrubfields by developing a mosaic of vegetation types. In some areas, removal of eucalyptus stands would result in conversion to oak-bay woodland, currently present in the understory. The proposed actions for the UCB treatment projects are described in the following subsections.

Table 1. Applicants, Application Numbers, and Acreage for the Proposed Hazardous Fire Risk Reduction Projects.

Project Area	Acres[1]
Oakland *(PDM-PJ-09-CA-2006-004)*	
North Hills-Skyline-*Oakland*	68.34
Caldecott Tunnel-*Oakland*	53.62
Frowning Ridge-*UCB*	185.18
Tilden-Grizzly Peak Blvd.- *EBRPD*	34.28
Sibley Island-*EBRPD*	3.92
Claremont Canyon-Stonewall-*EBRPD*	13.65
Subtotal	***359.0***
UCB *(PDM-PJ-09-2005-011)* *(PDM-PJ-09-CA-2005-003)*	
Strawberry Canyon	56.34
Claremont Canyon	42.81
Subtotal	***99.1***
EBRPD *(HMGP 1731-16-34)*	
Sobrante Ridge Regional Preserve	4.05
Wildcat Canyon Regional Park	65.60
Tilden Regional Park	97.70
Claremont Canyon Regional Preserve	21.56
Sibley Volcanic Regional Preserve	43.61
Huckleberry Botanic Regional Preserve	17.75
Redwood Regional Park	58.33
Leona Canyon Regional Open Space Preserve	4.58
Anthony Chabot Regional Park	199.99
Lake Chabot Regional Park	4.79
Miller-Knox Regional Shoreline[2]	22.23[2]
Subtotal	***540.2***[1]
TOTAL	**998.3**[1]

[1] The total project area in this table does not include the interconnected activities proposed by EBRPD in the WHRRMP (LSA Associates, Inc. 2009) and summarized in Table 2 that will be covered under this biological opinion.

[2] Although Miller-Knox Regional Shoreline is part of FEMA's proposed project, this project area is outside of the range of the California red-legged frog, Alameda whipsnake, and pallid manzanita, and, therefore, is not included in the action area for this biological opinion.

Vegetation Management

While UCB would be conducting selective eradication of exotic species (*e.g.*, eucalyptus, Monterey pine, and acacia), native and exotic woody shrubs, grasses and forbs would be monitored during the implementation and maintenance phases to exclude exotic species in favor of native species; therefore, suppressing succession of non-native invasive species, including species listed in the California Invasive Plant Council (*i.e.*, broom). Revegetation of treated areas would be fostered as part of the initial project via natural recruitment and maintenance. Treatment methods include hand tools, power tools, chemical control, and/or heavy equipment. Target trees would be cut by hand fellers and/or mechanized feller-buncher. Hand felling involves a pair of workers using chainsaws and wedges to directionally fell the tree in a manner that allows easy processing. The feller-buncher is a tracked vehicle, with a self-leveling cab, that mechanically grasps the standing tree, cuts it with a hydraulically powered chainsaw, and lifts the tree into bunches for skidding. The feller-buncher is limited to slopes of less than approximately 45 degrees.

Treatment Methods

To prevent re-sprouting, an herbicide solution would be applied by a qualified licensed pest control applicator to the cambium layer of the freshly cut tree stump within a few minutes of felling. In the maintenance phase, cut stubble or foliar application (by hand sprayer) would be made to coppiced (re-sprouted) stumps. The herbicide mixture would likely consist of a combination of Garlon 4 Ultra (triclopyr), Stalker (imazapyr), and/or RoundUp (glyphosate) in a solution of methylated seed oil, water, or other product as indicated and acceptable by the product label, and marking dye (*e.g.*, Hi-Light).

Trees within 50 feet of watercourses would be removed by hand felling only; no mechanized equipment is intended to be used for either removal or mastication in this 50-foot buffer. Except where more stringent herbicide application restrictions apply, UCB would implement chemical applications per the California Department of Pesticide Regulation (CDPR) pesticide guidance adjacent to water features. Within the stream buffer, cut stump application of approved herbicides would be applied within 60 minutes of felling. The areas chemically treated would include areas up to the ordinary high water mark of ephemeral streams; however, no trees would be treated within 50 feet of standing or running water or within 24 hours of a rain event.

Felled trees up to approximately 24 inches in diameter at breast height would be hauled by rubber-tired or tracked skidders along paths/skid trails, to landings in the project area. Nine landings exist adjacent to fire trails or paved roads in the UCB sections of the project area. Equipment would be staged, fueled, and maintained at these landings while contractors are mobilized. Additional landings may be created when the distance from a tree patch to an existing landing exceeds 1,000 feet. However, all material stockpiling and staging areas would be located in existing right-of-ways or at designated disturbed/developed areas. When possible, UCB would use landings and skid trails from previous loggings instead of constructing new ones. The project may also use a high-lead cable system to retrieve logs to the landing without the use of rubber-tired or tracked skidders.

At the landings, trees would be chipped using a grapple fed chipper or a tracked chipper. Trees would be fed into the chippers whole and pulled through the masticating blades by means of a conveyor belt and feed wheel. Alternatively, the tracked chipper may be driven to downed trees on moderate slopes, rather than having the trees first moved to a landing area. The wood chips from the chippers are expected to be one to four inches in size. Retained chips would be scattered on the site with an average depth ranging from four to 24 inches, depending upon site slope, proximity to watercourses, and viability of deposition from the chute of the chipper. The areal coverage of wood chips is not expected to exceed 20 percent of the project site (if a tracked chipper is used) and would be less than 15 percent if chipping is confined to roadways and landings.

A greater depth of chips (not to exceed 24 inches) would be used for the sediment trap to increase both the length of time the traps function and the amount of sediment that can be retained. Chips spread over uneven terrain (such as in natural depressions or around stumps) may also have a greater depth when the finished surface is raked to follow the general contour of the slope.

Chips could also be used to create skid roads in lieu of cutting into the soil because the mechanical skidders can travel atop the level chip bed, thus avoiding excavation and soil disturbance in many locations. When the chips decompose (at an estimated rate of four to seven inches per year), the contour of the slope is expected to reappear as it existed prior to logging, with less evidence of skid road creation and a more natural-appearing landscape.

Larger trees (greater than 24 inches diameter at breast height) would be lopped and scattered after felling. The lop-and-scatter method would also be used when it is impractical to skid a tree to the chipper, such as when trees are growing at a substantial distance from the main grove or when trees are up or down a steep slope. In these cases, the downed tree would be cut by chainsaws such that all portions of the tree would come into contact with the ground or within 24 inches of it. Typically, the tops are extensively cut and the main trunk is cut into 20- to 30-foot lengths. Some logs would be placed so that they help control sediment and erosion or support wildlife habitat.

Maintenance

All cut tree stumps would receive semiannual follow-up treatment of herbicides (Garlon 4 Ultra, Stalker, or RoundUp) on any emerging stump sprouts. Eucalyptus seedlings emerging from the latent seed stock in the project area would be managed over time to prevent re-colonization of the invasive species. Semiannual follow-up treatments would involve a low volume foliar spray mix applied to any re-sprouted foliage after the re-sprout reaches three feet in height but before it reaches six feet in height. Follow-up treatments may also include a basal bark application or the re-cutting of the sprout and treatment to the cut surface. In some re-sprout and seedling applications, RoundUp may be used in combination with Stalker in a foliar application. The herbicide applications are rotated for best impact in the growing season in which the application occurs. Follow-up efforts required for successful eradication of all eucalyptus re-sprouts and seedlings are anticipated to be in the range of seven to 10 years. Erosion control BMPs, as

identified by the San Francisco Bay Regional Water Quality Control Board, would be implemented to control erosion during and after vegetation removal.

The frequency of maintenance treatment is correlated with the effectiveness of the initial herbicide treatment. The coppiced stumps would be treated one or two times each year until the tree is killed. Stumps are generally killed after the initial treatment subsequent to felling. Trees surviving the initial treatment are typically killed within two or three follow-up treatments. Seedling germination is highly variable, dependent upon rainfall, temperature, chip depth, overstory canopy, etc. Seedlings are expected to be treated continuously throughout the year when the seedling is small and vulnerable (on a monthly basis). Noxious weeds would be targeted for control but not extirpation. In addition, though not a target species for extirpation, poison oak would be treated and controlled by foliar or cut stubble methods during the 10-year maintenance period to satisfy California Division of Occupational Safety and Health worker safety guidelines.

Monitoring

The monitoring plan for the UCB portion of the project implementation would be conducted at least two times per year for 10 years (UCB 2013). The protocol for monitoring would involve the Fire Program manager or his/her designee and/or consultants to walk within the treated areas to inspect for control of the target species (*e.g.*, eucalyptus, pine, and French broom). Such observations would be timed to occur at least twice prior to and after contract removal work, involving control of re-sprouting eucalyptus and acacia stems or seedlings of target species.

The areas would also be monitored from a distance using photographic stations previously identified. The photographs would be taken from permanent locations for each habitat type. Photographs would be taken within the project area to capture floral and faunal colonization in addition to assessing the natural recruitment/expansion of native floral communities.

Strawberry Canyon

The Strawberry Canyon portion of the proposed project (PDM-PJ-09-CA-2005-011) would consist of the selective removal of non-native vegetation such as eucalyptus (*Eucalyptus globulus* and *E. camaldulensis*), Monterey pine, and acacia species from within approximately 56.34 acres of Strawberry Canyon. The vegetation management strategy at this project area is to allow the forest to convert from the existing eucalyptus-dominated, non-native canopy to a native forest of California bay laurel, oak, big-leaf maple, California buckeye, California hazelnut, and other native tree and shrub species that currently exist beneath the canopy.

The proposed project at Strawberry Canyon would include removing approximately 10,000 stems of eucalyptus, pine, and acacia trees. The trees would be cut by hand fellers and/or the mechanized feller-buncher. The project area would be accessed through existing roads and would utilize approximately nine landings. Cutting would begin along the northern project area and would proceed south. Work contracts may be issued for more than one contiguous area, for example, 5-acre portions of cutting adjacent to Grizzly Peak Blvd. in the first year. Subsequent cut blocks would be contiguous to those already completed, each with a clear path to the extant

landing areas. The project duration is anticipated to be 24 to 36 months, with 20 to 40 weeks of actual vegetation removal work. Work is estimated to be conducted in August through November to avoid the wet season and avian nesting and fledging seasons. Work may be conducted during the winter months (weather permitting), but activities would not be performed on days with a 40 percent or greater chance of rain in areas where California red-legged frogs could occur, unless exclusion fencing has been installed and the biological monitor has determined that no California red-legged frogs are in the work area. In addition, ground disturbing activities that could collapse burrows would not occur within suitable habitat for the Alameda whipsnake during the hibernation period (November – March).

Claremont Canyon

The Claremont Canyon portion of the proposed project (PDM-PJ-09-CA-2005-003) is very similar to the Strawberry Canyon portion. The exceptions are that Claremont Canyon is predominantly dominated by eucalyptus and has very little Monterey pine and acacia. The three non-native tree species would be removed from a 42.81-acre area. The vegetation management strategy and project implementation for Claremont Canyon is the same as for Strawberry Canyon, including vegetation removal practices, chemical application, and in-place biomass deposition (woodchips/lop and scatter debris).

The proposed project at Claremont Canyon would involve removing approximately 12,000 stems of primarily eucalyptus but also some pine and acacia trees. The project may involve temporary closures of Claremont Avenue to allow for cutting and skidding of trees that are close to the roadway. The trees would be cut by hand fellers and/or the mechanized feller-buncher. Three temporary access roads are anticipated to be required at this project area. The three roads total approximately 2,600 feet in length and 12 feet in width and would be constructed within eucalyptus dominated forest. The roads would primarily follow existing logging roads created during work done in 1974–1975 when the site was last cleared, but would be restored after use to achieve hydrologic stability and serve as access paths for work crews during the 7-10 years of maintenance. It is estimated that earth moving would occur at the ends of each trail and at the switchbacks or where the path must be widened to safely handle the necessary logging equipment. Five landings exist adjacent to fire trails or paved roads in the project area.

The duration of project implementation is anticipated to be 24 to 36 months, with 20 to 35 weeks of actual vegetation removal work. Work is estimated be conducted in August through November to avoid the wet season and avian nesting and fledging seasons. Work may be conducted during the winter months (weather permitting) but activities would not be performed on days with a 40 percent or greater chance of rain in areas where California red-legged frog could occur, unless exclusion fencing has been installed and the biological monitor has determined that no California red-legged frogs are in the work area. Work would not be performed after a heavy rain or when the project area is unsuitably wet for logging operations. In addition, ground disturbing activities that could collapse burrows would not occur within suitable habitat for the Alameda whipsnake during the hibernation period (November – March).

Frowning Ridge

The Frowning Ridge portion of the proposed project (PDM-PJ-09-CA-2006-004) would consist of the selective removal of non-native vegetation such as eucalyptus, Monterey pine, and acacia from within approximately 185.08 acres of two canyons. The revegetation strategy for this project area is to allow the vegetation to convert from the existing eucalyptus-dominated, non-native canopy to a native forest of California bay laurel, oak, and other native grass and shrub species that currently exist beneath the canopy.

The project would involve removing approximately 24,000 stems of eucalyptus and pine trees with an estimated average height of over 100 feet and stem sizes of 2 to 36 inches diameter at breast height. The trees would be cut by hand fellers and/or the mechanized feller-buncher. The implementation of the proposed project at this project area may involve the closure of Grizzly Peak Blvd. for a few hours at a time to allow for the cutting and skidding of trees that grow close to the roadway. The Upper Jordan Fire Trail, an unimproved road on UCB land for pedestrian and emergency vehicle use, would be closed to the public as necessary during logging. Temporary access roads may be required. UCB would coordinate with local fire departments to permit emergency access or alternative access to the land served, as needed. The duration of project implementation is anticipated to be 20 to 35 weeks. Work is estimated to be conducted in August through November to avoid the wet season and avian nesting and fledging seasons. Work may be conducted during the winter months (weather permitting) but activities would not be performed on days with a 40 percent or greater chance of rain in areas where California red-legged frog could occur, unless exclusion fencing has been installed and the biological monitor has determined that no California red-legged frogs are in the work area. In addition, ground disturbing activities that could collapse burrows would not occur within suitable habitat for the Alameda whipsnake during the hibernation period (November – March).

Oakland

Oakland's grant application (PDM-PJ-09-CA-2006-004) includes six areas in which work would be completed by three property owners (Oakland, UCB, and EBRPD) (Table 1). The project areas include Oakland's North Hills-Skyline and Caldecott Tunnel-Ballfields projects (described below); UCB's Frowning Ridge project (described previously under the *UCB* section); and EBRPD's Tilden-Grizzly Peak Blvd., Sibley Island, and Claremont Canyon-Stonewall projects (described later under the *EBRPD* section).

Because Oakland is funding vegetation management in parcels owned by UCB and EBRPD through a portion of its grant, the methods for vegetation management, treatment, maintenance, and monitoring in those project areas would be implemented in the same manner and in conjunction with each corresponding applicant's grant-funded activities. The proposed actions for Oakland's projects include an area totaling 122.0 acres (North Hills-Skyline is 68.34 acres and Caldecott Tunnel-Ballfields is 53.62 acres). The proposed action for these project areas is discussed in the following subsections, whereas the proposed actions that would be implemented by UCB and EBRPD are described under its corresponding applicant.

Vegetation Management

In the Oakland parcels, the two project areas have distinctly different patterns of vegetation warranting different management. However, both have stands of eucalyptus that will be treated in a similar manner. In the northern portion of the Caldecott Tunnel project area, a canopy of re-sprouted eucalyptus and non-native pine and acacia trees produce high levels of flammable debris that preclude an understory of vegetation. Other portions are comprised of oak/bay woodlands, mesic north coastal scrub, and a large disturbed and developed area in the middle of the project area.

The vegetation management strategy promotes a conversion from a eucalyptus-dominated canopy to annual grassland and eventually to north coastal scrub. Treatments are limited to the area of eucalyptus. Target trees would be cut by hand fellers and/or a mechanized feller-buncher. Hand felling involves a pair of workers using chainsaws and wedges to directionally fell the tree in a manner that allows easy processing. The feller-buncher is a tracked vehicle, with a self-leveling cab, that mechanically grasps the standing tree, cuts it with a hydraulically powered chainsaw, and lifts the tree into bunches for skidding. The feller-buncher is limited to slopes of less than approximately 45 degrees. In the southern portion of the North Hills-Skyline project area, eucalyptus stands will be removed to release an emerging native forest of California bay, oak, maple, buckeye, and hazelnut, which produce less fuel loads.

The North Hills-Skyline project area is dominated by north coastal scrub that has scattered Monterey pine trees. These trees threaten to convert the scrub habitat to pine; therefore, vegetation management will be to remove those invasive exotic trees. One of the two long-range goals for these two project areas is to eradicate non-native, invasive and fire prone species (eucalyptus, Monterey pine, and acacia), and control plant species listed as noxious by the California Invasive Plant Council. The protection of the native species and ongoing management after project completion would ensure a successful conversion to a natural habitat that would lessen the risk of fire hazards.

The other long-range goal is to establish a fuel break along the western edge of Grizzly Peak Blvd., for a length of 3,660 feet and width of 100 feet. Within 100 feet of Grizzly Peak Blvd., Oakland will remove all Monterey pine trees and chip cut material. Oak and bay trees in this area would be limbed. Bays within 10 feet of oak canopies will be cut to help prevent the spread of sudden oak death. Shrubs under trees will be removed. All dead material will be cut and chipped. All shrubs will be removed within the first 30 feet of Grizzly Peak Blvd. Within the next 30 feet (30 to 60 feet from the road edge), up to 70 percent of the shrub cover would be thinned creating approximately 50-foot-diameter patches of shrubs (shrub islands) spaced about 50 feet apart. The outer 40 feet of the fuel break (60 to 100 feet from the road edge) would not be treated.

Treatment Method

During the project implementation, the native understory trees and shrubs would be protected, while the exotic trees would be removed and eucalyptus and acacia stump cambium chemically treated with herbicide to prevent re-sprouting. Felled eucalyptus, Monterey pine, and acacia

would be removed, chipped, or lopped and scattered on the project site. Logs would be placed and retained as a component of the sediment/erosion control measures and/or to serve as habitat to support a variety of wildlife species.

Eucalyptus trees and pines would be removed by logging contractors using methods consistent with the California Forest Practices Rules, and as specified in the Timber Harvest Plan that will be prepared for the sites. The Timber Harvest Plan will be prepared by Oakland and UCB to fulfill the California Environmental Quality Act requirements. The Timber Harvest Plan will be prepared by a registered licensed forester and will contain detailed information on the timber operations.

The site would be accessed from various pullouts along Grizzly Peak Blvd., Tunnel Road, and Skyline Blvd. Because access to the site is feasible from the pullouts, staging areas would not be necessary. Any pines or eucalyptus not reachable from the road would be hand felled and retained, lopped, and scattered onsite.

Trees would be cut using directional hand held chainsaws. The larger tree trunks would be stripped of their limbs, skidded, and removed by truck. Limbs and tree trunks smaller than 24 inches diameter at breast height would be chipped and left onsite to a depth of 4 to 24 inches, depending on slope, proximity to watercourses and viability of deposition from the chute of the chipper employed. The areal coverage of the wood chips is not to exceed 20 percent of the project site and would be less than 10 percent if chipping is confined to the roadways and landings. During logging, BMPs will be implemented to minimize the impacts to any native understory plants, habitats, and the disturbance of the soil and slopes. The project may also use a high-lead cable system to retrieve logs to the landing without the use of rubber-tired or tracked skidders.

Except where more stringent herbicide application restrictions apply, treatments will be consistent with the Oakland Creek Ordinance. Based on this ordinance, trees within 50 feet of watercourses would be removed by hand felling only; no mechanized equipment is intended to be used for either removal or mastication in this 50-foot buffer. Oakland would implement chemical applications per the CDPR pesticide guidance adjacent to water features. Within the stream buffer, cut stump application of approved herbicides would be applied within 60 minutes of felling. The areas chemically treated would include areas up to the ordinary high water mark of ephemeral streams; however, no trees would be treated within 60 feet of standing or running water or within 24 hours of a rain event.

To suppress potential eucalyptus and acacia re-sprouts, all cut stump cambium would be chemically treated with a combination of Garlon 4 Ultra (triclopyr), Stalker (imazapyr), and/or RoundUp (glyphosate), a colorant, and an approved carrying agent such as methylated seed oil, water, or other product as indicated acceptable by the project label. All cut re-sprouts and new seedlings would be hand-pulled or receive semiannual follow-up treatment of herbicides (Garlon 4 Ultra, Stalker, or RoundUp) to ensure the permanent elimination from the project area. Noxious weeds would be targeted for control, but not extirpated, consistent with performance criteria. In addition, though not a target species for extirpation, poison oak would be treated and suppressed by foliar or cut stubble methods during the 10-year maintenance period to satisfy

California Division of Occupational Safety and Health worker safety guidelines. The use of herbicide would be applied in accordance with current approved label instructions and CDPR procedures and regulations.

In addition, a 60-foot buffer would be established around surface waters where there would be no foliar application of herbicides. Herbicides would be applied directly to stumps. In these areas, as well as areas greater than 60 feet from surface waters but where there is potential for herbicides to reach aquatic habitats via runoff or drift, only aquatic-safe formulations of herbicides would be used (*e.g.*, Garlon 3A), and use of the more toxic Garlon 4 Ultra would not be allowed. In addition, herbicides would not be applied within 24 hours of predicted rain events (40 percent or greater chance for rainfall) or if wind speeds are greater than 10 miles per hour or less than 2 miles per hour, to reduce the potential for runoff or drift of herbicides into surface water bodies.

Treatments required to install a fuelbreak will employ hand labor to prune the lower branches of trees, and either move cut material to be chipped or lop and scatter cut material. Mechanical equipment may be used to cut grass and shrubs within reach of the road.

The implementation of treatments for Oakland's projects will adhere to Oakland's Noise and Tree Protection Ordinances, Section 17.120.050 and Chapter 12.26, respectively, of Oakland's Municipal Code and Oakland's Creek Protection, Storm Water Management and Discharge Control Ordinance (Chapter 13.16) of the City's Municipal Code.

Maintenance

Maintenance and invasive species control of restored areas would occur for 10 years after initial project implementation is completed. Restoration of disturbed areas would focus on promoting native vegetation succession and improving species habitat through the encouragement of natural recruitment. Noxious plants would be prevented from colonizing the sites by means of chemical, mechanical, or manual removal and control.

Non-native invasive plant management strategies would be used in the project areas after the initial treatment is complete and would then be sustained through the biological inspections process. During the first three years of maintenance, non-native invasive plant management activities are expected to be bimonthly throughout the year. As part of the adaptive management plan, non-native invasive plant management actions would be determined by a qualified biologist familiar with invasive plant life cycles and control. Inspections would be conducted throughout the year. Non-native invasive plant inspection would coincide with other vegetation monitoring activities where applicable.

Monitoring

The progress of the project implementation would be monitored at least one time per year for 10 years. The protocol for monitoring would involve Oakland's project representative or his/her designee and/or Service- and/or NMFS-approved biological consultants to walk within the removal areas to inspect for control of the target species (*e.g.*, pine, eucalyptus, French broom).

Monitoring would include an assessment of the natural recruitment and expansion of native floral communities in relation to the vegetation management goals and would be timed to coincide with the optimal periods for identification of performance metrics (Oakland 2013). Monitoring would include photographic documentation at the macro level for each project site and habitat type. Photographs would be taken within the project area to capture floral composition and monitor the success of the vegetation goals (Oakland 2013).

North Hills-Skyline

The 68.34-acre North Hills-Skyline project area includes eucalyptus, pine, and brush along the south side of State Route 24 and west of Grizzly Peak Blvd. Hazardous fuel reduction on this site would extend the fuel break created by existing projects with UCB and the EBRPD. The long-range goal would be to eradicate French broom, eucalyptus, and Monterey pines across the entire ridgeline and establish a 3,660-foot long by 100-foot-wide ridgeline fuel break along Grizzly Peak Blvd. Within the first 30 feet from the edge of the road, all of the vegetation would be removed. Within the next 30 feet (30 to 60 feet from the road edge), up to 70 percent of the shrub cover would be thinned creating approximately 50-foot-diameter patches of shrubs (shrub islands) spaced about 50 feet apart. Oak-bay trees in this area would be limbed. The outer 40 feet of the fuel break (60 to 100 feet from the road edge) would not be treated. Oakland will also create about 10.45 acres of foraging/dispersal habitat and 8.5 acres of core scrub habitat for the Alameda whipsnake within the North Hills-Skyline project area by removing non-native trees (including about 90 large Monterey pines) and converting to grassland, oak woodland, and shrub habitats. The project implementation is expected to take approximately 36 months with 20-40 weeks of removal work.

Access to the site would be from various pullouts along Grizzly Peak Blvd., Tunnel Road, and Skyline Blvd. All pines and eucalyptus trees not reachable from the road will be hand felled, and retained, lopped and scattered, or chipped. Mechanized (feller-buncher) equipment would be used from roads only to cut and place trees in locations that can be cut into pieces that are easily moved. No skid trails will be used. Hand labor will be used away from roads or in areas of slope greater than 35 percent.

Caldecott Tunnel

The 53.62-acre Caldecott Tunnel project area is located adjacent to State Route 24, Tunnel Road, and Skyline Blvd. Previous eucalyptus and pine removal on Oakland lands have occurred on the northern half of this project area. Vegetation management at this location would be executed in a similar manner as in the eucalyptus stand in the North Hills-Skyline treatment area, with mechanized (feller-buncher) equipment to be used from roads only and hand labor in areas away from roads at slopes greater than 35 percent. Existing access routes will be used to remove eucalyptus; no new access routes are anticipated. Three landing sites are anticipated and would be located in areas of previous disturbance. The project implementation is expected to take approximately 36 months with 20-40 weeks of removal work.

EBRPD

EBRPD's grant application (HMGP 1731-16-34) involves the treatment of 540.7 acres throughout 11 regional parks in the East Bay Hills of western Alameda County and western Contra Costa County, California: Sobrante Regional Preserve, Wildcat Canyon Regional Park, Tilden Regional Park, Claremont Canyon Regional Preserve, Sibley Volcanic Regional Preserve, Huckleberry Botanic Regional Preserve, Redwood Regional Park, Leona Canyon Regional Open Space Preserve, Anthony Chabot Regional Park, Lake Chabot Regional Park, and Miller-Knox Regional Shoreline (Table 1). EBRPD would treat an additional three project areas totaling 51.9 acres using funds from Oakland's grant application (PDM-PJ-09-CA-2006-004): Tilden-Grizzly Peak Blvd., Sibley Island, and Claremont Canyon-Stonewall (Table 1). The proposed project will be implemented in 14 EBRPD regional parks and/or preserves, which are further delineated as recommended treatment areas (RTA). The priority of the proposed project within EBRPD is to reduce fuel load and sources by suppressing the density of undesirable invasive plant species within the disturbed treatment areas. Such actions would take place through implementation and long term maintenance of tree and brush removal (mechanical and hand), herbicide treatment, and although not funded by FEMA, animal grazing and pile burning.

Each RTA was evaluated by EBRPD's fire marshal to identify the treatment methods needed to meet vegetation management goals, as described below. In general, most eucalyptus stands would be thinned with a target goal of 50 percent canopy cover, and most non-native coniferous stands would be removed. Depending on location, the scrub/shrub vegetation classes would be thinned, resulting in a less dense shrub cover and conversion from a closed canopy shrub stand to a more open-canopied shrub stand. Shrub "islands" would be created through mosaic thinning or patch retention thinning resulting in a total canopy cover of between 30 and 50 percent shrubs and 50 to 70 percent grassy openings. The shrub "islands" would be approximately 50 feet in diameter and spaced 50 feet apart with grassy openings between the islands (i.e., shrubs within the "islands" would not be thinned). "Islands" would be in natural appearance and include specimens of variable age classes.

Vegetation Management

The majority of the wildfire hazard reduction would focus on removing non-native invasive species of trees and shrubs, such as eucalyptus (*Eucalyptus globulus* and *E. glaucus)*, Monterey pine, acacia species, and French broom. Additionally, selective removal and/or reduction of native shrubs, such as coyote brush and sage, would be implemented to prevent additional fuel sources for fire.

Native forests, such as oak-bay woodland, that are present onsite would be protected and promoted through the reduction of undesirable forested areas dominated by eucalyptus, pine and/ or acacia plantations. Removal of these species or thinning of plantations to promote established understory native tree species is the priority during project implementation. Reduction of downed woody fuels within oak-bay woodlands, or reducing the density of branches low to the ground by "limbing up" trees, would focus on maintaining healthy stands and reducing the available fuels in the event of a wildfire in this habitat. In treatment areas where oaks and bays are overly dense, these trees may be thinned, favoring retention of healthy, larger oaks and bays

to foster the health, vigor, and fire resilience of the residual stand. Native redwood forests would not be targeted for any removal or reduction, but would be protected during operations in treatment areas within which they occur.

Brush habitats would be thinned to reduce the amount and continuity of standing fuels and flame length, reduce invasive undesirable woody species, and allow for additional native species diversity within the stands. Brush habitat would be maintained as viable species habitat, increasing the quality of the habitat where possible by removing invasive species, and connecting existing brush habitat with viable wildlife corridors.

Perennial and annual grasses would be managed to maintain open grassland habitat, reduce brush encroachment, increase native species diversity, reduce fuel loads, and maintain travel corridors for native wildlife species. All aquatic, wetland, and riparian habitat would be managed to maintain, protect, and encourage the expansion of these habitats (where feasible) to the greatest extent. Measures to prevent erosion or sedimentation into these habitats would be deployed in all cases where these habitats occur in or near project sites.

Treatment Methods

Treatment prescriptions for EBRPD RTAs are developed in order to achieve the vegetation management goals following guidance under the WHRRMP (LSA Associates, Inc. 2009). The guidance recommends selective thinning of areas dominated by non-native invasive species that contribute to the existing fuel load. Thinning would be conducted to achieve a target canopy cover of 50 percent. Eucalyptus, Monterey pine, and acacia trees would be targeted to reduce the density of stems per acre, remove entire groves, and/or maintain established mature trees in a setting that reduces the amount of standing and dead fuels by creating widely spaced larger diameter trees. Trees would be felled or pruned to remove lower limbs, downed woody litter would be removed from under trees, and stumps and seedlings would be treated to prevent re-sprouting.

In most cases, understory vegetation of desirable species would be protected and promoted to replace eucalyptus plantations over time. Logs would be placed and retained as a component of the sediment/erosion control measures to improve wildlife habitat and to provide for long-term soil productivity. Trees would be removed from the sites or in limited cases, chipped and left onsite. If left onsite, the wood chips generated would be left at a depth of four to six inches, with an aerial cover of no more than 20 percent of the project site, and no more than 10 percent on roadways and landings. In addition, although not funded under the FEMA HMGP grant program, pile burning may be used under prescribed and permitted conditions to dispose of some of the cut woody material.

During tree felling operations, stumps of eucalyptus and acacia species would be treated using a cut stump treatment. The herbicide application would include a combination of either Roundup or Garlon 4 Ultra, a colorant, and an approved carrier agent, such as Hasten oil, water, or other product as indicated acceptable by the product label. In the maintenance phase, cut stubble or foliar application (by hand sprayer) would be made to coppiced (re-sprouted) stumps. Poison oak may be selectively treated to allow passage along maintenance trails, but would not be

targeted for extirpation, and would instead be suppressed during the maintenance phase for worker safety, per the California Occupational Safety and Health Administration's guidelines.

Except where more stringent herbicide application restrictions apply, trees within 50 feet of the high water mark of permanent or perennial watercourses would be removed by hand felling only; no mechanized equipment would enter this 50-foot buffer for either removal or mastication. Felled material within the buffer may be removed by end-lining with cables and winches attached to mechanized equipment stationed outside the buffer. EBRPD would implement chemical applications per the label instructions and CDPR pesticide guidance adjacent to water features. Within the stream buffer, cut stump application of approved herbicides would be applied within 60 minutes of felling. The areas chemically treated would include areas up to the ordinary high water mark of standing or flowing water; trees would not be treated within 24 hours of a rain event.

Seedlings of eucalyptus, Monterey pine, or acacia would be hand-pulled or chemically treated, as determined by the size of growth. Seedlings too difficult to pull would be treated by foliar treatment if they are three to six feet in height. Seedlings over six feet in height would be cut to within 18 inches of grade and be treated using a cut stubble treatment of herbicide. Noxious weeds would be treated by foliar method or cut stump stubble treatment if drift would be likely to impact non-targeted species. Erosion control BMPs and general avoidance and minimization measures would be implemented to control erosion during and after vegetation removal.

Maintenance

Existing undesirable species would be targeted initially during the first year following project implementation. Each initial treatment area would be assessed by qualified personnel (with expertise in botany, wildlife, storm water, etc.) prior to treatment activities to inform treatment prescriptions and protective measures for special status species, sensitive and desirable habitat, and the potential for habitat enhancements.

Frequency of maintenance treatment is a function of effectiveness of initial treatment. The coppiced stumps would be treated up to two times each year until the stump is eradicated (on average, stumps are eradicated within two treatments). Seedling germination is highly variable, dependent upon rainfall, temperature, chip depth, overstory canopy, etc. It is expected that seedlings would be treated up to twice a year in order to control the seedling when it is small and vulnerable.

Follow-up treatment of re-sprouts would be conducted annually for long-term maintenance. Additionally, eucalyptus seedlings emerging from the latent seed stock in the project area would be managed over time to prevent re-colonization of this invasive species. Experience has demonstrated that most seed stock of pine and eucalyptus is exhausted within five to seven years of felling, provided that no mature trees of the species remain. Thus, extirpation (99.9 percent control) would be expected within seven years if all of the mature eucalyptus were removed from EBRPD project areas. However, since EBRPD proposes to thin eucalyptus forests instead of eradicating them, the extirpation of eucalyptus from the project areas is unlikely. Also there is always the possibility of seeds migrating onto the site via watercourses, gravity, animal vectors,

or wind, thus the target species may continue to manifest sporadically until all trees in a region are extirpated.

Monitoring

EBRPD is committed to monitoring the vegetation management and recovery as part of their long-range monitoring and maintenance plan as outlined in their WHRRMP (LSA Associates, Inc. 2009) and their Draft MMP (EBRPD 2013), and any Service-approved revisions to the Draft MMP. A Treatment Assessment Form would be utilized to fully assess environmental characteristics (vegetative composition, wildlife habitat, bird nesting, hydrologic features, archaeological resources, etc.) for each initial treatment area and then later utilized to monitor the success of treatment.

Following initial fuels treatment, monitoring, maintenance and reporting would occur on an appropriate schedule for the ongoing achievement of vegetation management goals. Post-treatment monitoring would consider the environmental characteristics (erosion/soil stability, tree sprouting, resulting vegetative composition, invasive non-native plant species, wildlife habitat, special status species, etc.) to inform the ongoing management strategies to achieve desired vegetation management goals as described in the WHRRMP and MMP. Assessments would record the percent coverage of the treated site by desirable (native species habitat) and target non-desirable species (weeds, invasive plants, re-sprouted target plants). This information would be used to inform the adaptive management strategy and develop a prescription for further action on the site to attain the vegetation management goals identified in the WHRRMP and MMP.

The frequency by which a post-treatment area would be monitored over a 10-year monitoring period would be determined by specific site conditions after treatment and in accordance to an adaptive management process. Proposed frequency schedule would include monitoring at least annually for the first five years, and then once in years seven and 10. All information regarding pre- and post-treatment activities would be included in a WHRRMP database for future reference and development of adaptive management strategies.

Permanent photographic stations would be established to display the changes in vegetation cover and ephemeral stream channels after the initial fuels management treatment. Included within the annual assessment developed by the EBRPD, a representative photograph would be captured of the project site from a consistent location. Pre-treatment assessments would record the latitude and longitude and compass bearing of the photo. This photograph would be used in combination with other data on vegetation and habitat, as a guide to track recovery of an area towards the vegetation management goal.

Sobrante Ridge Regional Preserve

The Sobrante Ridge Regional Preserve portion of the project consists of 4.05 acres in RTA SO001, which is located on the western edge of the preserve. The area contains northern maritime chaparral, annual grassland, riparian woodland, oak-bay woodland/forest, and pallid manzanita. The vegetation management strategy for this project is to allow the forest to convert

to oak woodland and annual grassland. In areas where pallid manzanita occurs, EBRPD would comply with the Draft Minimization, Avoidance, and Compensation Measures for the pallid manzanita (Service *in litt.* September 12, 2012), which state "All shrubs and trees that are not a component of the maritime chaparral vegetation type within 20 feet of pallid manzanita plants and all shrubs or trees that are excessively shading pallid manzanita plants (i.e., pines, acacias, eucalyptus, oak, bay, madrone, etc.) will be cut and treated to reduce competition with pallid manzanitas and to reduce fuel loads." Other measures described in the *Conservation Measures* section for pallid manzanita would be implemented.

EBRPD proposes to retain pallid manzanita plants and prune trees and other plants around the pallid manzanita to allow it to grow unimpeded. EBRPD also proposes to use hand labor in areas of pallid manzanita to limit ground disturbance and prevent mature oak canopy from being affected. The agency's goal is to eliminate ladder fuels such as dead standing trees and low hanging limbs that may allow a fire to spread from the ground level to the crowns of trees, and to prune out dead branches, remove small pine, and French broom. In compliance with the Draft Minimization, Avoidance, and Compensation Measures for the pallid manzanita, "Herbicide use within 300 feet of pallid manzanitas will be applied through direct application to the stump only" (Service *in litt.* September 12, 2012). Herbicide will be applied to cut stumps of French broom using a mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye. Vegetation would be cleared to maintain defensible space around homes, which is a buffer where vegetation is removed or treated to slow the spread of wildfires towards structures. Approximately 50 percent of the cut material would be removed from the site, and the remaining material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions.

No new access roads would be required, and existing strategic fire roads will be used and will be returned to existing conditions. The duration of the implementation of the project is anticipated to take up to six months to complete.

Wildcat Canyon Regional Park

The Wildcat Canyon Regional Preserve portion of the project consists of 65.60 acres in the following five RTAs: WC003, WC004, WC009, WC010, and WC011. Because of the presence of steep slopes and mapped landslides, the potential for soil movement would likely preclude the use of heavy machinery. EBRPD would keep deep-rooted plants onsite where feasible to stabilize soil. Due to the existing seedbed, the potential for the spread of French broom is high if ground disturbance occurs. A mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye would be applied to control French broom. EBRPD would remove north coastal scrub and broom to speed succession to oak woodland and would prune trees according to the oak woodland performance standards as described in the EBRPD's WHRRMP. Isolated stands of eucalyptus and pine trees would be thinned for a target canopy cover of 50 percent, and hazard trees would be removed. Hazard trees are trees that are identified by a qualified individual as having significant structural deficiencies caused by storm damage, disease, senescence, growth form, soil conditions or other factors, and contributing to a high potential for the tree to fall apart or topple over and hit targets such as trails, roads, power lines, structures, or other improvements. Material larger than six inches in diameter would be removed from the site (approximately 25 percent); all other

material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. Animal grazing and/or hand labor would be used to maintain the site.

The five RTAs associated with the Wildcat Canyon Regional Preserve portion of the project are as follows:

1. **RTA WC003**. RTA WC003 is a 1.67-acre area located at the northern end of the park and contains annual grassland and oak-bay woodland, but is dominated by coyote brush scrub. The vegetation management strategy for this RTA is to speed succession to oak woodland by removing shrubs that limit growing conditions for trees. Riparian plants (willows) are present in the RTA, and EBRPD would assess the area for possible aquatic features (riparian corridors and wetlands) located in this area.

    a. All dead wood would be removed in willows, and lower branches would be pruned to retain willow thickets. EBRPD would retain coffeeberry and prune shrubs similar to trees to create defensible space. Trees would be pruned to remove limbs up to eight feet above ground, and smaller trees would be thinned out. As the willows are in a riparian habitat, where typically the fire danger is decreased, the removal of branches would be minimal. Since this area is suitable habitat for California red-legged frog, a biological monitor would be present during implementation of all treatment activities. In addition, all RTAs would be monitored at least annually as per the monitoring requirements defined in the WHRRMP and MMP. The Stewardship department may determine that there needs to be additional surveys and subsequent restoration to the site. Approximately 33 percent of the cut material would be scattered off-site, 33 percent of material would be chipped onsite, and 33 percent of the cut woody material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. Mechanical brushing equipment would be used in conjunction with hand labor in easily accessible areas. A mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye and/or hand labor would be used to reduce brush, with no foliar application in areas at least 60 feet from aquatic habitats. EBRPD proposes to use animal grazing and/or hand labor to maintain the site. No new access routes would be required. The project implementation is anticipated to take up to three months to complete.

2. **RTA WC004**. RTA WC004 is a 7.96-acre area located at the northern end of the park and contains California annual grassland, oak-bay woodland/forestland, northern coastal scrub (xeric), and developed/disturbed/landscaped areas. The vegetation management strategy for this RTA is to create an environment of annual grassland and north coastal scrub, scattered oaks, and eucalyptus.

    a. Willows exist on the eastern edge of the southern portion of the RTA. Except for debris removal and pruning, treatments would be avoided where feasible within the willow thickets. To the east of nearby homes, the site would be maintained by annual grazing or mowing of grasslands using a front deck rotational mower mounted on a Bobcat. In areas where California red-legged frog or Alameda

whipsnake could occur, work would not commence until the biological monitor has determined that no California red-legged frogs or Alameda whipsnakes are in the work area.

b. South of the water tank that is onsite, mowing would continue as a treatment option, as would pruning eucalyptus and removing short pines and small eucalyptus. Because of proximity to homes, all native trees on this site would be thinned and pruned to remove limbs up to approximately eight feet above ground. Approximately 25 percent of the cut woody material would be chipped and scattered near trails to a small depth depending upon site slope, proximity to watercourses, and viability of deposition from the chute of the chipper. The remaining cut woody material would be removed from the site. In areas of coastal scrub, mechanical brushing equipment would be used and a mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye would be applied, if necessary, to limit invasion of French broom. No new access routes would be required. The project implementation is anticipated to take up to three months to complete.

3. **RTA WC009**. RTA WC009 is an 11.47-acre area located along the southwestern edge of the park and contains oak-bay woodland/forest, coastal scrub (mesic and xeric), riparian woodland, and developed/disturbed/landscaped areas. The vegetation management strategy for this RTA is to create an environment of emerging oak-bay woodland with an understory of ferns and oak litter (no understory shrubs), and separate patches of north coastal scrub. The management would be completed by removing all dead wood and pruning lower branches of willows according to performance standards. A mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye would be applied, if necessary, to limit invasion of French broom. All cut material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. No new access routes would be required. The project implementation is anticipated to take up to three months to complete.

4. **RTA WC010**. RTA WC010 is a 10.79-acre area located along the southwestern edge of the park that contains oak-bay woodland/forestland, coastal scrub (mesic and xeric), and developed/disturbed/landscaped areas. The vegetation management strategy for this RTA is to create an environment of oak woodland with willows and emerging oak woodland.

a. Due to the presence of steep topography and mapped landslides, the potential for soil movement will likely preclude use of heavy machinery. Deep-rooted plants would be kept onsite where feasible to stabilize soil. French broom would be controlled with the use of herbicides (Garlon 4 Ultra/Hasten) in a cut-stump method. Additionally, north coastal scrub and broom would be removed to speed succession to oak woodland. Trees would be pruned accordingly to oak-woodland performance standards. Isolated stands of eucalyptus and pine trees would be removed. Material over six inches in diameter would be removed from site; all other material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. No new access routes would be

required. The project implementation is anticipated to take up to six months to complete.

5. **RTA WC011**. RTA WC011 is a 33.70-acre area located along the southwestern edge of the park. The RTA contains northern coastal scrub (mesic and xeric), oak-bay woodland/forestland, riparian woodland, California annual grassland, eucalyptus forest/plantation, and developed/disturbed/landscaped areas. The vegetation management strategy for this RTA is to create an environment of emerging and established oak woodland, separate areas of coastal scrub, and grasslands where no trees exist.

    a. Due to the presence of steep slopes, high soil moisture and landslide history, the use of heavy machinery would be precluded; therefore, deep-rooted plants would be retained where feasible to stabilize soils. French broom would be controlled with the use of herbicides (Garlon 4 Ultra/Hasten) in a cut-stump method. Additionally, north coastal scrub and broom would be removed to speed succession to oak woodland. Trees would be pruned accordingly to oak-woodland performance standards. Thin isolated stands of eucalyptus and pine trees would be removed. Material over six inches in diameter would be removed from site; all other material would be piled and left onsite for later disposal by prescribed burning and fuel conditions. No new access routes would be required. The project implementation is anticipated to take up to one year to complete.

Tilden Regional Park

The Tilden Regional Park portion of the project consists of a 97.70-acre area in the following four RTAs: TI006, TI012, TI015, and TI022, as described below.

1. **RTA TI006**. RTA TI006 is a 3.97-acre area located at the northwestern end of the park. This RTA contains oak-bay woodland/forestland, eucalyptus forest/plantation, broom scrub, developed/disturbed/landscaped areas, and coyote brush scrub. The vegetation management strategy for this RTA is to create an environment of emerging oak-bay woodland.

    a. Because of the presence of steep topography and mapped landslides at this location, the potential for soil movement would require hand labor instead of heavy machinery for the initial treatment. EBRPD would keep deep-rooted plants onsite where feasible to stabilize soil. The potential for French broom spread is high if ground disturbance occurs. EBRPD would remove and spray French broom, eucalyptus trees, and sprouts as well as north coastal scrub using a mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye. Trees would be pruned according to oak woodland performance standards (LSA Associates, Inc. 2009). Any willows would be retained, but dead wood would be removed and lower branches would be pruned. All cut woody material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. No new access roads would be required. Duration of the project implementation is anticipated to take up to one year to complete.

2. **RTA TI012**. RTA TI0012 is a 41.65-acre area located at the southern end of the park and contains oak-bay woodland/forestland, eucalyptus forest/plantation, broom scrub, developed/disturbed/landscaped areas, and coyote brush scrub. The vegetation management strategy for this RTA is to thin the eucalyptus to promote the growth and succession of redwoods, oak-bay woodland, annual grassland, and north coastal scrub.

    a. EBRPD proposes to reduce surface fuel volumes on the site by removing forest litter, dead bark, branches, small diameter trees, and understory shrubs. Eucalyptus would be thinned to approximately 25-foot spacing, and eucalyptus around developed oak-bay woodlands would be removed. Elsewhere on the site emphasis would be placed on removing small or unhealthy trees and trees with multiple stalks. Branches would be pruned and ladder fuels would be removed from pine, oak, eucalyptus, and fir. Material more than six inches in diameter would be removed from the site (approximately 25 percent); all other material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. French broom would be lopped and scattered and sprayed with a mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye. All treatment methods (mechanical, hand, grazing and herbicides) are proposed for managing the vegetation on this site. EBRPD would continue to mow and weed-eat behind homes. Animal grazing and/or hand labor would be used to maintain the site. No new access roads would be required. Duration of the project implementation is anticipated to take up to one year to complete.

3. **RTA TI015**. RTA TI015 is a 45.64-acre area located at the southern end of the park and contains oak-bay woodland/forestland, coyote brush scrub, developed/disturbed/ landscaped, redwood forest, coastal scrub (xeric), non-native coniferous forest, and California annual grassland. The vegetation management strategy for this RTA is to create an environment of oak-bay woodland, redwood, and scattered north coastal scrub.

    a. Pine, fir, and eucalyptus would be thinned in and around the tracks of the steam trains. All ladder fuels would be removed around the tracks and structures at the steam trains. Approximately 25 percent of the cut woody material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions; the remaining 75 percent would be removed. All treatment methods (mechanical, hand, grazing and herbicides) may be used when protective measures for the Little Steam Train and Corporation Yard are included. Conditions for western leatherwood would be enhanced. Animal grazing and/or hand labor would be used to maintain the site. Herbicides may be needed to help control any invasive species that follow initial treatment. No new access roads would be required. Duration of the project implementation is anticipated to take up to one year to complete.

4. **RTA TI022**. RTA TI022 is a 6.44-acre area located at the southern end of the park and contains coyote brush scrub, non-native coniferous forest, northern coastal scrub, developed/disturbed/landscaped areas, California annual grassland, and non-native

coniferous forest. The vegetation management strategy for this RTA is to create an environment of annual grassland and scattered pines with separate areas of coastal scrub.

a. EBRPD considers the communication tower in this RTA to be vital infrastructure and would take into consideration the aesthetic value of the pines in blocking views of the tower. Branches up to 10 feet would be pruned and small diameter pine, oak, and bay would be removed. EBRPD would cut and spray 75 percent of the coyote brush and all of the French broom using a mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye. Approximately 75 percent of cut woody material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions; the remaining 25 percent would be removed. Mastication and mowing are proposed options for managing the vegetation on this site. Animal grazing and/or hand labor would be used to maintain the site. Herbicides, as described previously, may be needed to help control any invasive species. No new access roads would be required. Duration of the project implementation is anticipated to take up to six months to complete.

Claremont Canyon Regional Preserve

The Claremont Canyon Regional Preserve portion of the project consists of a 21.56-acre area in the following four RTAs: CC001, CC003, CC006, CC007, CC008, CC010, and CC012.

1. **RTA CC001**. RTA CC001 is a 2.28-acre area located at the western end of the preserve and contains eucalyptus, northern coastal scrub, oak-bay woodland, and developed/ disturbed/landscape areas. The vegetation management strategy for this RTA is to create an environment of open eucalyptus stand with minimal understory, oak-bay woodland, and patches of north coastal scrub away from structures. Also, the goal is to create a fire-safe buffer of grass adjacent to residences, without eucalyptus.

    a. EBRPD proposes to maintain a grassland buffer in low fuel condition above the homes. In addition, they would remove dead and downed debris, prune or thin low hanging oak and bay trees, remove all young pines, and cut and spray brush on the slope, leaving remnants of large, burned dead pines to provide for moisture retention and wildlife habitat. Eucalyptus would be thinned and hazardous or over-mature trees would be removed. A 200-foot grass buffer would be created above homes and non-native *Pittosporum* species would be removed. All cut woody material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. The cut stumps would be treated with a mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye. No new access roads would be required. Duration of the project implementation is anticipated to take up to six months to complete.

2. **RTA CC003**. RTA CC003 is a 2.74-acre area located along the northwestern edge of the preserve and contains coyote brush scrub and developed/disturbed/landscaped areas. The vegetation management strategy for this RTA is to create an environment of perennial and annual grasslands, and oak-bay woodland.

a. EBRPD would remove pine trees on the ridgeline to prevent widespread distribution of embers. Hand labor would be used to reduce brush. Cut material more than six inches in diameter would be removed from site (approximately 25 percent); all other material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. EBRPD proposes to use a rotation of mechanical treatments of hand labor, grazing, and herbicides to control or reduce broom and or brush invasion. No new access roads would be required, though an unpaved strategic fire route will be cleared and maintained. Duration of the project implementation is anticipated to take up to one year to complete.

3. **RTA CC006**. RTA CC006 is a 3.34-acre area located at the southern edge of the preserve and contains oak-bay woodland/forestland and northern coastal scrub (xeric). The vegetation management strategy for this RTA is to create an environment of oak woodland with understory of oak, herbs and ferns, grasses, and short, scattered, or low-volume scrub.

   a. EBRPD proposes to use animal grazing for initial and follow-up treatments. Animal grazing would be used during appropriate seasons to avoid effects to Alameda whipsnakes (although the vegetation treatment that results from grazing would have an effect on Alameda whipsnake habitat). EBRPD would also prune mature oaks after grazing and pile and leave them onsite for later disposal by burning under prescribed weather and fuel conditions and would implement measures described in the *Conservation Measures* to avoid effects to Alameda whipsnake. Mechanical treatment would not be used because of the steep slopes. Defensible space would be created above residences by removing brush. No new access roads would be required. Duration of the project implementation is anticipated to take up to six months to complete.

4. **RTA CC007**. This 1.72-acre area along the northwestern edge of the preserve contains coyote brush scrub and developed/disturbed/landscaped areas. The vegetation management strategy for this RTA is to create an environment of perennial and annual grasslands.

   a. Invasive species are a concern at this RTA because of existing seedbed. EBRPD proposes to use chemical treatment and hand labor to reduce brush/grass. All cut woody material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. EBRPD proposes that successful treatment would require a carefully timed rotation of mechanical treatments of hand labor, grazing, and herbicide to control or reduce broom and or brush invasion. No new access roads would be required. Duration of the project implementation is anticipated to take up to three months to complete.

5. **RTA CC008**. RTA CC08 is a 3.72-acre area located at the south central area of the preserve and contains oak-bay woodland/forestland, developed/disturbed/landscaped areas, and coyote brush scrub. The vegetation management strategy for this RTA is to

create an environment of landscaping, scrub and oak woodlands, and to reduce the proportion of California bay saplings in the understory.

a. EBRPD would use hand labor treatments to create and maintain spacing between shrubs and prune lower tree branches according to defensible space performance standards (LSA Associates, Inc. 2009). EBRPD would mow grasses and remove two-thirds of the small (less than four inches) bay trees in the understory. All cut woody material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. Animal grazing and/or hand labor would be used to maintain the site. No new access roads would be required, though an unpaved strategic fire route will be cleared and maintained. Duration of the project implementation is anticipated to take up to three months to complete.

6. **RTA CC010**. This 5.36-acre area is located at the south central area of the preserve and contains oak-bay woodland/forestland, coyote brush scrub, developed/disturbed/ landscaped areas, and northern coastal scrub (xeric). The vegetation management strategy for this RTA is to create an environment of northern coastal scrub and oak woodland.

a. French broom and invasive plant species are a concern in this area. EBRPD would use animal grazing, mechanical treatment, or hand labor to remove woodland understory and reduce scrub between woodlands. Oak woodlands would be pruned to remove lower limbs, and two-thirds of the small bay trees and one-third of the medium-sized (four to eight inches in diameter) bay trees would be removed. EBRPD would thin eucalyptus and treat stumps with a mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye. Cut material more than six inches in diameter would be removed from the site (approximately 25 percent); all other material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. No new access roads would be required, though an unpaved strategic fire route will be cleared and maintained. Duration of the project implementation is anticipated to take up to six months to complete.

7. **RTA CC012**. This 2.40-acre area in the eastern edge of the preserve contains northern coastal scrub and developed/disturbed/landscaped areas. The vegetation management strategy for this RTA is to create an area of scrub (no French broom or pines) and short-stature trees with low ember producing potential.

a. Spread of broom into disturbed ground is a concern for this area. EBRPD would consider spreading pine chips onsite to cover bare patches. EBRPD would remove and spray eucalyptus re-sprouts and brush (using a mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye) before seed set. Mechanical or hand labor treatments would be used to remove pines; machinery would be used to grind smaller pines and leave material onsite. If removed using hand labor, whole trees would be hauled off-site. Approximately 50 percent of the cut material would be ground or chipped onsite, and 50 percent would be removed. One of EBRPD's goals is to maintain defensible space around communication tower and access

road. No new access roads would be required. Duration of the project implementation is anticipated to take up to three months to complete.

Sibley Volcanic Regional Preserve

The Sibley Volcanic Regional Preserve portion of the project consists of a 43.61-acre area in the following three RTAs: SR001, SR004, and SR005.

1. **RTA SR001**. RTA SR001 is a 7.88-acre area located at the northwestern edge of the preserve and contains oak-bay woodland/forestland, coniferous forest, coyote brush scrub, and developed/disturbed/landscaped areas. The vegetation management strategy for this RTA is to create an environment of oak-bay and Monterey pine with sparse understory.

    a. Invasive species are a concern at this RTA because of the existing seedbed. EBRPD would remove understory shrubs, young pine, and low-hanging branches beneath mature pines, as well as all hazardous and structurally-weak mature pines. All treatment methods except mechanical (hand labor, grazing, and herbicides) may be used. Cut material more than six inches in diameter would be removed from site (approximately 25 percent); all other material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. One of EBRPD's goals is to maintain defensible space around the communication tower, access road, and behind the homes. Animal grazing and/or hand labor would be used to maintain the site. No new access roads would be required. Duration of the project implementation is anticipated to take up to three months to complete.

2. **RTA SR004**. RTA SR004 is a 12.94-acre area located in the western central portion of the preserve and contains oak-bay woodland/forest, northern coastal scrub (xeric), coyote brush scrub, and developed/disturbed/landscaped areas. The vegetation management strategy for this RTA is to create an environment of oak-bay woodland, scattered north coastal scrub, and annual grassland.

    a. The presence of steep slopes on the site would preclude mechanical treatments except near roadways. EBRPD would remove shrubs near emerging oak-bay trees to speed succession to oak-bay woodland within 100 feet of the road. EBRPD would also cut and spray invasive broom (using a mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye), prune up low-hanging branches, and remove dead and downed material. All cut woody material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. Animal grazing and/or hand labor would be used to maintain the site. No new access roads would be required. Duration of the project implementation is anticipated to take up to six months to complete.

3. **RTA SR005**. This 22.79-acre area is located in the southwestern edge of the preserve and contains coyote brush scrub and non-native coniferous forest. The vegetation

management strategy for this RTA is to create an environment of oak-bay woodland, scattered north coastal scrub, annual grassland, and riparian woodland. There is one pallid manzanita plant located within this RTA, which would require the use of hand labor and other measures described in the *Conservation Measures*.

a. EBRPD would remove eucalyptus and pines within 100 feet of the ridgeline and remove hazard trees along roads and trails. Trees and other plants around pallid manzanita would be trimmed to allow it to grow unimpeded. All small-diameter eucalyptus and pine would be removed to eliminate the fuel ladder into mature pine overstory. A mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye would be applied to cut eucalyptus stumps. EBRPD would also cut and spray brush (using a mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye) to provide defensible space. Cut material more than six inches in diameter would be removed from site (approximately 50 percent); all other material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. Animal grazing and/or hand labor would be used to maintain the site. No new access roads would be required. Duration of the project implementation is anticipated to take up to one year to complete.

Huckleberry Botanic Regional Preserve

The Huckleberry Botanic Regional Preserve portion of the project consists of a 17.76-acre area in the following in four RTAs: HP001, HP002, HP003, and HP004, as described below.

1. **RTA HP001.** This 1.71-acre area in the southwestern edge of the preserve and contains eucalyptus forest/plantation and northern coastal scrub. The vegetation management strategy for this RTA is to create an environment of oak-bay woodland near roads and thinned eucalyptus below in the areas that are currently eucalyptus.

    a. Steep slopes at the site require erosion control measures for mechanical treatments. EBRPD would remove eucalyptus within 100 feet of the ridgeline and thin trees below the ridgeline to 25-foot spacing by selecting smaller trees, unhealthy trees, and trees with multiple trunks for removal. EBRPD would prune all retained trees to eight feet above ground. Surface fuel reduction would be emphasized in follow-on treatments. Mechanical treatment is proposed for tree removal, and all methods (mechanical, hand, grazing and herbicides) may be used for surface fuel reduction. A mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye would be used to control eucalyptus re-sprouting. Cut material more than six inches in diameter would be removed from site (approximately 50 percent); all other material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. No new access roads would be required. Duration of the project implementation is anticipated to take up to six months to complete.

2. **RTA HP002.** This 13.62-acre area is located in the southwestern edge of the preserve and contains oak-bay woodland/forest, northern maritime chaparral, northern coastal

scrub, and developed/disturbed/landscaped areas. The vegetation management strategy for this RTA is to create an environment of oak-bay woodland with separate areas of scattered north coastal scrub to promote the expansion of pallid manzanita onsite.

a. Presence of pallid manzanita requires hand labor treatments and other measures described in the *Conservation Measures*. EBRPD would remove non-manzanita shrubs to reduce fuel volume and would prune retained trees such that they do not shade pallid manzanita plants. All cut woody material would be piled and left onsite in areas away from pallid manzanita plants for later disposal by burning under prescribed weather and fuel conditions. A mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye would be used to treat broom. No new access roads would be required. Duration of the project implementation is anticipated to take up to six months to complete.

3. **RTA HP003.** RTA HP003 is a 1.12-acre area located in the southeastern edge of the preserve and contains northern maritime chaparral and pallid manzanita. The vegetation management strategy for this RTA is to create an environment of oak-bay woodland, pallid manzanita, and separate areas of scattered north coastal scrub.

a. Presence of pallid manzanita requires hand-labor treatments and other measures described in the *Conservation Measures*. EBRPD would remove non-manzanita shrubs to reduce fuel volume and would prune retained trees such that they do not shade pallid manzanita plants. All cut woody material would be piled and left onsite in areas away from pallid manzanita plants for later disposal by burning under prescribed weather and fuel conditions. A mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye would be used to treat broom. No new access roads would be required. Duration of the project implementation is anticipated to take up to three months to complete.

4. **RTA HP004.** RTA HP004 is a 1.31-acre area located in the southeastern edge of the preserve and contains oak-bay woodland/forest, northern maritime chaparral, and develop/disturbed/landscaped areas. The vegetation management strategy for this RTA is to create an environment of oak-bay woodland, pallid manzanita, and scattered north coastal scrub.

a. Potential presence of pallid manzanita requires hand-labor treatments and other measures described in the *Conservation Measures*. EBRPD would remove non-manzanita shrubs to reduce fuel volume and would prune retained trees. All cut woody material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. A mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye would be used to treat broom. No new access roads would be required. Duration of the project implementation is anticipated to take up to three months to complete.

Redwood Regional Park

The Redwood Regional Park portion of the project consists of a 58.33-acre area in the following eight RTAs: RD001, RD002, RD003, RD004, RD005a, RD005b, RD009, and RD011, as described below.

1. **RTA RD001.** This 0.23-acre area is located in the northeastern end of the park and contains coniferous forest and northern coastal scrub (xeric). The vegetation management strategy for this RTA is to create an environment of open Monterey pine stands with understory of pine litter, grassland, scattered low shrubs, and annual grasses.

    a. EBRPD would remove small and unhealthy pines and pines with poor structural stability. EBRPD would maintain low fuel volume under Monterey pines above Phillips Loop Trail by thinning coastal scrub and cutting and spraying broom using a mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye. Cut material more than six inches in diameter would be removed from the site (approximately 50 percent), and all other material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. No new access routes would be required. The project implementation is anticipated to take up to six months to complete.

2. **RTA RD002.** This 5.01-acre area is located in the northeastern end of the park and contains eucalyptus forest/plantation. The vegetation management strategy for this RTA is to thin the red gum eucalyptus understory and create an environment of oak-bay woodland.

    a. Steep slopes would likely require additional mitigation measures for treatments using heavy machinery. EBRPD would remove eucalyptus within 100 feet of the ridgeline, thin trees below the ridgeline to 25-foot spacing by selecting for removal eucalyptus that are around developed oak-bay woodlands. Elsewhere, EBRPD would emphasize removal of small or unhealthy trees or trees with multiple stalks. Limbs of all retained trees would be pruned up to eight feet above ground. EBRPD would emphasize surface fuel reduction following initial treatment by removing forest litter, dead bark and branches, and understory shrubs. Cut material more than six inches in diameter would be removed from the site (approximately 50 percent). All other cut woody material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. Mechanical treatments are proposed for tree removal, and mechanical, hand, grazing and herbicide treatments may be used for surface fuel reduction and maintenance. No new access routes would be required. The project implementation is anticipated to take up to one year to complete.

3. **RTA RD003.** RTA RD003 is an 11.82-acre area located in the northeastern end of the park and contains eucalyptus forest/plantation, riparian woodland, coyote brush scrub, oak-bay woodland/forestland, redwood forest, and developed/disturbed/landscaped areas.

The vegetation management strategy for this RTA is to create an environment of red gum eucalyptus with a sparse understory and oak-bay woodland with willows.

a. EBRPD would reduce shrubs beneath eucalyptus trees through grazing except in riparian areas. The dense tree spacing on the site is not conducive to mechanical treatment, and hand labor is proposed only along trails because of the large size of the treatment area. All cut woody material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. EBRPD would treat broom with a mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye. However, EBRPD would avoid treatments in all willow areas. No new access routes would be required. The project implementation is anticipated to take up to one year to complete.

4. **RTA RD004.** RTA RD004 is a 27.80-acre area located in the northeastern end of the park and contains non-native coniferous forest, oak-bay woodland/forestland, coyote brush scrub, developed/disturbed/landscaped areas, and eucalyptus forest/plantation. The vegetation management strategy for this RTA is to create an environment of annual grassland, with scattered Monterey pine and oak-bay woodland.

   a. EBRPD would emphasize understory and surface fuel treatments by removing forest litter, dead bark and branches, and understory shrubs (primarily coyote brush, but may also include small patches of poison oak). All treatment methods may be used (grazing, hand, mechanical, and herbicides). EBRPD would remove structurally unsound, mature, or hazardous trees. Eucalyptus sprouts, re-sprouts, and broom would be cut and sprayed with a mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye. Low-hanging branches would be pruned. Cut material more than six inches in diameter would be removed from the site (approximately 50 percent), and all other material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. EBRPD would conduct pre-treatment surveys for the presence of Oakland Star tulip and western leatherwood, and any patches of these or other special-status plant species will be protected by flagging. Habitat would be enhanced for Oakland Star tulip and western leatherwood where appropriate. No new access routes would be required. The project implementation is anticipated to take up to two years to complete.

5. **RTA RD005a.** This 1.10-acre area is located in the northeastern area of the park and contains eucalyptus forest/plantation. The vegetation management strategy for this RTA is to create an environment of annual grassland safety zone.

   a. EBRPD would remove all eucalyptus trees within the RTA through the use of mechanical methods or hand labor. Material over six inches in diameter would be removed from the site (up to 50 percent). All of the material would be scattered below and outside of the RTA. Animal grazing, herbicide application, and/or hand labor would be used to maintain the site. No new access routes would be required. The project implementation is anticipated to take up to six months to complete.

6. **RTA RD005b.** This 8.45-acre area is located in the northeastern area of the park and contains non-native coniferous forest, developed/disturbed/landscaped areas, redwood forest, and oak-bay woodland/forestland. The vegetation management strategy for this RTA is to create an environment of scattered Monterey pine, oak-bay woodland, annual grassland, and redwoods.

    a. EBRPD's high priority for this RTA is to create and maintain defensible space around Chabot Space and Science Center. EBRPD would remove structurally unsound mature pine trees and pines above well-developed oak-bay woodlands. All retained trees would be pruned, and shrubs under trees would be removed. Young pines would be removed and shrub cover would be maintained at less than 30 percent cover. Approximately 50 percent of cut woody material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions, and the remaining material would be removed. Broom would be treated with a mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye. Animal grazing and/or hand labor would be used to maintain the site. No new access routes would be required. The project implementation is anticipated to take up to one year to complete.

7. **RTA RD009.** This 2.92-acre area is located in the east-central area of the park and contains developed/disturbed/landscaped areas, northern coastal scrub (xeric), and oak-bay woodland/forestland. The vegetation management strategy for this RTA is to create an environment of oak-bay woodland near roads, separate areas of coastal scrub, and successional grasslands under eucalyptus located further uphill.

    a. EBRPD's goal is to create and maintain defensible space around the fire station and Piedmont Stables. EBRPD would remove eucalyptus and coyote brush to restore successional grasslands within 200 feet of the fire station or where feasible. EBRPD would also remove all shrubs and small trees under eucalyptus and oak-bay trees and prune trees to eight feet above ground. The eucalyptus groves would be thinned, and a mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye would be applied to cut stumps. Approximately 50 percent of cut woody material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions, and the remainder of the cut material would be removed. No new access routes would be required. The project implementation is anticipated to take up to six months to complete.

8. **RTA RD011.** This 1.02-acre area is located along the northeastern edge of the park and contains northern coastal scrub (xeric). The vegetation management strategy for this RTA is to create an environment of successional grasslands.

    a. EBRPD would use mechanical treatment to cut brush. French broom control would also be conducted in this RTA, including herbicide treatment (using a mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye), hand labor, and animal grazing to help maintain the site. All cut broom would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. No new

access routes would be required. The project implementation is anticipated to take up to three months to complete.

Leona Canyon Regional Open Space Preserve

The Leona Canyon Regional Open Space Preserve portion of the project consists of a 4.58-acre area in the RTA LE005. This RTA contains northern coastal scrub (xeric), coniferous forest, and oak-bay woodland/forestland. The vegetation management strategy for this RTA is to create an environment of perennial grasses, scattered coastal scrub, and oak-bay woodland.

Steep slopes and lack of access behind homes limit the use of mechanical equipment. Broom would be cut and sprayed with a mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye. All cut woody material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. Animal grazing and/or hand labor would be used to maintain the site. No new access routes would be required. The project implementation is anticipated to take up to six months to complete.

Anthony Chabot Regional Park

The Anthony Chabot Regional Park portion of the project consists of a 200.0-acre area in the following nine RTAs: AC001, AC002, AC003, AC006, AC007, AC011, AC012, AC013, and AC014, as described below.

1. **RTA AC001**. RTA AC001 is a 4.32-acre area located at the northeastern end of the park and contains oak-bay woodland/forestland and northern coastal scrub (xeric). The vegetation management strategy for this RTA is to create an environment of oak woodland with herbaceous understory, patches of shrubs, and occasional eucalyptus trees and pines.

    a. Steep slopes may preclude the use of machinery. EBRPD would use hand labor or animal grazing to remove understory shrubs for oak woodlands and to create grassy openings in shrub patches to reduce fuel volumes. EBRPD would cut and/or spray broom with a mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye. EBRPD would create defensible space by pruning lower branches of existing oak trees, mowing grass, and creating spaces between shrubs. EBRPD would maintain the site using hand labor and applying herbicides to control invasive species. All cut woody material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. No new access routes would be required. The project implementation is anticipated to take up to three months to complete.

2. **RTA AC002**. RTA AC002 is a 2.48-acre area located at the northeastern end of the park and contains coniferous forest, developed/disturbed/landscaped areas, and northern coastal scrub. The vegetation management strategy for this RTA is to create an environment of mowed grass on the west, landscaping, and oak woodland to south.

a. EBRPD would consider landscaping with fire-resistant plants. EBRPD would create defensible space according to performance standards (LSA Associates, Inc. 2009) by pruning lower branches of existing oak trees, mowing grass, and creating spaces between shrubs. Steep slopes may preclude the use of machinery. EBRPD would use hand labor or animal grazing to remove understory shrubs for oak woodlands and to create grassy openings in shrub patches to reduce fuel volumes. EBRPD would cut and/or spray broom with a mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye. All cut material would be removed. No new access routes would be required. The project implementation is anticipated to take up to six months to complete.

3. **RTA AC003**. RTA AC003 is a 27.5-acre area located at the northeastern end of the park and contains coastal scrub (xeric) and oak-bay woodland/forestland. The vegetation management strategy for this RTA is to create an environment of oak woodland with herbaceous understory, and patches of shrubs in open grassland.

    a. EBRPD would remove understory shrubs from oak woodland to limit torching potential and to provide more growing space for emerging trees. EBRPD would also create grassy openings in shrub patches and prune trees 100 to 150 feet below property boundaries to reduce total fuel volume. The isolated groves of eucalyptus and pine would be thinned, and hazard trees would be removed. An herbicide mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye would be used to control broom and eucalyptus re-sprouting. All treatment methods (mechanical, hand, grazing and herbicides) are acceptable for initial and follow-up treatment because of the wide range of terrain, access, and species distribution/composition. Approximately 50 percent of the cut woody material would be removed, and the remaining cut woody material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. No new access routes would be required. The project implementation is anticipated to take up to six months to complete.

4. **RTA AC006**. RTA AC006 is a 25.52-acre area located along the western-central boundary of the park and contains coyote brush scrub, oak-bay woodland/forestland, coastal scrub (xeric), coniferous forest, eucalyptus forest/plantation, developed/ disturbed/landscaped areas, and successional grassland. The vegetation management strategy for this RTA is to create an environment of oak-bay woodlands, scattered pines, and eucalyptus, all with minimal understory vegetation.

    a. EBRPD would remove understory shrubs from oak woodland to limit torching potential and to provide more growing space for emerging trees. EBRPD would also create grassy openings in shrub patches and prune trees 100 to 150 feet below property boundaries to reduce total fuel volume. Isolated groves of eucalyptus and pine would be thinned, and hazard trees would be removed. An herbicide mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye would be used to control broom. All treatment methods are acceptable (mechanical, hand, grazing and herbicides) because of wide range of terrain, access, and species distribution/

composition. Cut material more than six inches in diameter would be removed from the site (approximately 25 percent); all other material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. No new access routes would be required. The project implementation is anticipated to take up to one year to complete.

5. **RTA AC007**. RTA AC007 is an 8.44-acre area located along the western-central boundary of the park and contains developed/disturbed/landscaped areas, northern coastal scrub (xeric), California annual grassland, coniferous forest, and oak-bay woodland/ forestland. The vegetation management strategy for this RTA is to create an environment of annual grassland in southern and western areas and oak woodland with understory of herbs and scattered north coastal scrub, redwood forest, and thinned eucalyptus in the eastern and northern area.

    a. Steep slopes on the eastern side of this RTA limit the types of tree cutting and removal operations possible. EBRPD would use annual control and monitoring of invasive species using a hand-applied application of Garlon 4 Ultra, Hasten oil, and Hi-Light dye. On the eastern edge of the RTA, EBRPD would thin eucalyptus to minimize ember production and distribution and would also prune all trees retained. On the western side, EBRPD would use animal grazing to limit shrub encroachment and would apply a mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye to control invasive species. The understory shrubs would be removed from the oak woodland to limit torching potential and provide more growing space for emerging trees. EBRPD would also create grassy openings in shrub patches and prune trees 100 to 150 feet below property boundaries to reduce total fuel volume. Isolated groves of eucalyptus and pine would be thinned and hazard trees would be removed. Herbicides would also be used to control broom. All treatment methods are acceptable (mechanical, hand, grazing, and herbicides) because of wide range of terrain, access, and species distribution/ composition. Cut material more than six inches in diameter would be removed from the site (approximately 50 percent), and all other cut woody material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. No new access routes would be required. The project implementation is anticipated to take up to six months to complete.

6. **RTA AC011**. RTA AC011 is a 26.15-acre area located in the southwestern area of the park and contains eucalyptus forest/plantation, coyote brush scrub, oak-bay woodland/ forestland, developed/disturbed/landscaped areas, northern coastal scrub, and annual grassland. The vegetation management strategy for this RTA is to create an environment of mature eucalyptus stands, grassland with scattered shrubs in fuel breaks, and oak-bay woodlands.

    a. Steep slopes at this RTA may preclude machinery or require specific logging techniques to minimize soil disturbance. EBRPD would create defensible space and access along trails and create vistas on strategic look outs. EBRPD would maintain and expand fuel breaks by thinning, using mechanical treatments, or

spraying according to performance standards (LSA Associates, Inc. 2009). In areas of well-developed native understory, EBRPD would remove eucalyptus from the overstory. Animal grazing and/or hand labor would be used to maintain the site. Cut material more than six inches in diameter would be removed from the site (approximately 33 percent), and all other material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. No new access routes would be required. The project implementation is anticipated to take up to six months to complete.

7. **RTA AC012**. RTA AC012 is an 18.93-acre area located in the southwestern area of the park and contains coyote brush scrub, northern coastal scrub, successional grassland, and eucalyptus forest/plantation. The vegetation management strategy for this RTA is to create an environment of mature eucalyptus stands with grassland with scattered shrubs in fuel breaks and oak-bay woodland.

    a. Steep slopes may preclude machinery or require specific logging techniques to minimize soil disturbance. EBRPD would thin eucalyptus and brush to expand the fuel break and remove all eucalyptus where oak-bay woodland understory is well developed. Animal grazing and/or hand labor would be used to maintain the site, and a mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye would be applied. Cut material more than six inches in diameter would be removed from the site (approximately 33 percent), and all other material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. No new access routes would be required. The project implementation is anticipated to take up to one year to complete.

8. **RTA AC013**. RTA AC013 is a 16.85-acre area located at the southern end of the park and contains eucalyptus forest/plantation, California annual grassland, coyote brush scrub, and developed/disturbed/landscaped areas. The vegetation management strategy for this RTA is to create an environment of mature eucalyptus, mowed grass, and shrubs close to campgrounds and landscaping.

    a. EBRPD would manage vegetation to allow screening for privacy in the campground. EBRPD's priority is to ensure public safety and the ability to evacuate campers and visitors in an emergency. EBRPD would thin selected areas of eucalyptus to reduce fuel volume and retain screening around the campground by establishing shrubs between campgrounds. EBRPD would select for retention the trees that provide screening and still avoid creation of ladder fuels. EBRPD would protect trees and areas used by great blue herons for rookery. Animal grazing would be used for the areas that are not in the campground. Cut material would be masticated or mulched onsite. Follow-up treatment would include animal grazing and herbicides (a mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye). No new access routes would be required. Project implementation is anticipated to take up to six months to complete.

9. **RTA AC014**. RTA AC014 is a 92.55-acre area located at the southern end of the park and contains coyote brush scrub, California annual grassland, oak-bay woodland/forestland, coastal scrub (xeric), eucalyptus forest/plantation, and riparian woodland. The vegetation management strategy for this RTA is to create an environment of successional grassland with a mix of grass and shrubs.

    a. EBRPD would install a safety zone for campers by alternating between grazing and mowing shrubs. EBRPD would also create a wildfire "refuge" or shelter-in-place area that is large enough to accommodate all park visitors/campers. No new access routes would be required. The project implementation is anticipated to take up to two years to complete.

Lake Chabot Regional Park

The Lake Chabot Regional Park portion of the project consists of a 4.79-acre area in RTA LC010. This RTA is located in the southeastern end of the park and contains California annual grassland, coyote brush scrub, and oak-bay woodland/forestland. The vegetation management strategy for this RTA is to create an environment of oak-bay woodland with minimal understory.

EBRPD would maintain minimal understory through animal grazing or hand labor treatments. Improved fire protection capability would be created according to performance standards (LSA Associates, Inc. 2009) (in particular, pruning lower branches of existing oak and bay trees, removing eucalyptus and pine, mowing grass, and creating spaces between shrubs). Approximately 50 percent of the cut woody material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions, and 50 percent would be removed. No new access routes would be required. The project implementation is anticipated to take up to six months to complete.

Miller/Knox Regional Shoreline

The Miller/Knox Regional Shoreline portion of the project consists of a 22.23-acre area in the following five RTAs: MK001, MK002, MK003, MK004, and MK005. Since the Miller/Knox Regional Shoreline portion of the proposed project is outside of the range of federally listed species, it is not included in this biological opinion.

Tilden-Grizzly Peak Blvd.

The Tilden-Grizzly Peak Blvd. portion of the project consists of a 34.28-acre area in the following five RTAs: TI012, TI013, TI014, TI015 and TI016. These RTAs are located in the southwestern end of the Tilden-Regional Park, as described below.

1. **RTA TI012**. This 12.93-acre area contains eucalyptus forest/plantation, successional grassland, coniferous forest, oak-bay woodland/forestland, northern coastal scrub (mesic and xeric), coyote brush scrub, and developed/disturbed/landscaped. The vegetation strategy for this RTA is to create an environment of thinned eucalyptus, with redwood, oak-bay woodland, annual grassland, and north coastal scrub.

a. EBRPD's goal is to reduce surface fuel volumes by removing forest litter, dead bark, small diameter trees and branches, and understory shrubs. EBRPD would thin eucalyptus to 25-foot spacing or less by selecting for removal the eucalyptus that are around developed oak-bay woodlands and by removing small or unhealthy trees or those with multiple stalks. No new access routes would be required. The project implementation is anticipated to take up to one year to complete.

2. **RTA TI013**. This 15.71-acre area contains oak-bay woodland/forestland, northern coastal scrub (xeric), coniferous forest, eucalyptus forest/plantation, California annual grassland, riparian woodland, and coyote brush scrub. The vegetation management strategy, proposed work, erosion control, and maintenance is the same as for TI012. No new access routes would be required. The project implementation is anticipated to take up to one year to complete.

3. **RTA TI014**. This 2.82-acre area contains eucalyptus forest, redwood forest, and developed/disturbed/landscaped areas. The vegetation management strategy for this RTA is to reduce surface fuel volumes by removing forest litter, dead bark, small diameter trees and branches, and understory shrubs. Herbicides would be utilized to control eucalyptus re-sprouting. No new access routes would be required. The project implementation is anticipated to take up to six months to complete.

4. **RTA TI015**. This 1.46-acre area contains eucalyptus forest, oak-bay woodland, and redwood forest. The vegetation management strategy for this RTA is to reduce surface fuel volumes by removing forest litter, dead bark, small diameter trees and branches, and understory shrubs. No new access routes would be required. The project implementation is anticipated to take up to three months to complete.

5. **RTA TI016**. This 1.36-acre area contains eucalyptus forest/plantation. The vegetation management strategy for this RTA is to create an environment of emerging oak-bay woodland and northern coastal scrub. EBRPD would remove eucalyptus and pine within 100 feet of the ridgeline. Because of the steep slopes and small size of the RTA, mechanical treatments may be precluded. No new access routes would be required. The project implementation is anticipated to take up to six months to complete.

Sibley Island

The Sibley Island portion of the project is a 3.92-acre area in RTA SR003 located along the southwestern edge of the larger Sibley Volcanic Regional Preserve. This RTA contains successional grassland, developed/disturbed/landscaped areas, eucalyptus forest, northern coastal scrub, and oak-bay woodland. The vegetation management strategy for this RTA is to create an environment of annual grassland and scattered north coastal scrub.

EBRPD would remove eucalyptus on the western portion of Sibley Island to complete the fuel break. Cut stumps would be treated with a mixture of Garlon 4 Ultra, Hasten oil, and Hi-Light dye to control eucalyptus re-sprouting. Cut material would be chipped and redistributed to a

maximum depth of four inches onsite. All other cut material would be removed from the site completely (approximately 25 percent). EBRPD would reduce brush, leaving pockets of standing brush for habitat. EBRPD would use mowing and/or animal grazing to maintain the site. No new access routes would be required. The project implementation is anticipated to take up to six months to complete.

Claremont Canyon-Stonewall

The Claremont Canyon-Stonewall portion of the project is a 13.65-acre area in RTA CC001 located along the southwestern end of the larger Claremont Canyon Regional Preserve. This RTA contains eucalyptus forest/plantation, oak-bay woodland/forestland, California annual grassland, coyote brush scrub, and developed/disturbed/landscaped areas. The vegetation management strategy for this RTA is to create an environment of open eucalyptus stand with minimal understory, oak-bay woodland, and patches of north coastal scrub away from structures. In addition, EBRPD would create a fire-safe buffer of grass without eucalyptus above homes. EBRPD would thin the remaining eucalyptus to create a fuel break and maintain grassland in low-fuel condition above the homes. EBRPD would remove dead and downed debris smaller than eight inches in diameter and would prune or remove small oak and bay trees, remove all young pines and non-native *Pittosporum* species on the slope, and leave remnants of large, burned dead pines to provide for moisture retention and wildlife habitat. The site would be maintained to minimize the understory in the eucalyptus stands. No more than 25 percent of the cut material, with a six-inch maximum diameter, would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions. The other 75 percent of the cut material would be removed from the site. The cut woody material left onsite would later be disposed of by burning under prescribed weather and fuel conditions. EBRPD would use hand labor and/or animal grazing to maintain the site. No new access routes would be required. The project implementation is anticipated to take up to one year to complete

Interconnected Parcels

A total 100 RTAs totaling about 2,375 acres located within 13 regional parks comprise the interconnected parcels from EBRPD's WHRRMP. The work to be completed for these 13 regional parks is described in the following subsections. Due to the similarities in design elements, proximity to each other, and overlap and wide distribution of federally listed species with potential to occur on the project areas, the potential effects to listed species are anticipated to be of the same nature and similar magnitude for the proposed project and the interconnected parcels from EBRPD's WHRRMP. There are no identified interconnected projects that would be implemented by Oakland or UCB. Table 2 below lists the EBRPD's interconnected parcels identified by regional park and RTA that are covered under this biological opinion. Maps of the interconnected parcels are enclosed in Appendix A.

Anthony Chabot Regional Park

Interconnected actions in Anthony Chabot Regional Park would be implemented within areas totaling 883.0 acres. Primary vegetation communities found in these areas are eucalyptus forest/plantation (78 percent). The next most prevalent vegetation communities are bay

Table 2. Interconnected Parcels within EBRPD's WHRRMP.

Park	**Acres**
Anthony Chabot	882.9
Claremont Canyon	130.4
Huckleberry	0.3
Kennedy Grove	15.2
Lake Chabot	96.7
Leona Canyon	60.5
Point Pinole Regional Recreation Area[1]	478.4[1]
Redwood	105.2
Sibley Volcanic	118.4
Sobrante	14.3
Temescal	1.5
Tilden Regional Preserve	414.3
Wildcat Canyon	56.6
TOTAL	**2374.76**

[1] Although Point Pinole Regional Recreation Area is part of EBRPD's WHRRMP, this project area is outside of the range of federally listed species and thus is not included in the action area for this biological opinion.

woodland (6 percent) and successional grassland (4 percent). Vegetation management activities would generally entail removal and/or thinning of eucalyptus stands and brush to expand fuel breaks and create successional grassland. Steep slopes in some areas may preclude machinery or require specific logging techniques to minimize soil disturbance. Cut material more than six inches in diameter would be removed from the site (approximately 25 percent); all other material would be piled and left onsite for later disposal by burning under prescribed weather and fuel conditions.

Claremont Canyon Regional Preserve

Interconnected actions in Claremont Canyon Regional Preserve would be implemented within areas totaling 130.4 acres, primarily consisting of xeric coastal scrub (61 percent), oak-bay woodland/forest (14 percent), and coyote brush scrub (9 percent). Vegetation management activities would focus on creating an environment of northern coastal scrub and oak woodland, with removal and control of invasive species. Methods would include hand labor, pruning, mowing, and chipping.

Huckleberry Botanic Regional Preserve

Interconnected actions in Huckleberry Botanic Regional Preserve would be implemented within areas totaling 0.3 acre and consisting primarily of xeric coastal scrub (83 percent). Vegetation management would entail removal of non-manzanita shrubs to reduce fuel volume, and pruning of retained trees (consisting of oak and bay trees). Due to the presence of pallid manzanita in this area, hand labor would be used along with other measures described in the *Conservation Measures* section.

Kennedy Grove

Interconnected actions in Kennedy Grove would be implemented within areas totaling 15.2 acres, consisting primarily of eucalyptus forest/plantation (54 percent), oak-bay woodland/forest (18 percent), and developed/disturbed/landscaped (17 percent). Vegetation management in these areas would entail removal of bay and eucalyptus trees smaller than eight inches to prevent fire spread to eucalyptus canopies and removal of the accumulation of forest litter, with the main goal of protecting nearby structures from fire. Mechanical and hand labor would be used.

Lake Chabot Regional Park

Interconnected actions in Lake Chabot Regional Park would be implemented within areas totaling 96.7 acres, consisting primarily of eucalyptus forest/plantation (55 percent) and California annual grassland (26 percent). Vegetation management would entail removing eucalyptus to minimize ember production and distribution. All treatment methods for removal are possible, but large tree diameters may limit the use of feller-bunchers. The primary goal would be to reduce understory fuels and remove selected eucalyptus to enhance travel along the designated strategic fire route, selecting for removal a greater number of eucalyptus trees nearest the road. Steep slopes likely limit off-road mechanical treatments, but access for on-road treatments is good. Consideration of visual effects is important in this area because eucalyptus trees are a prominent ridgeline feature.

Leona Canyon Regional Open Space Preserve

Interconnected actions in Leona Canyon Regional Open Space Preserve would be implemented within areas totaling 60.5 acres, consisting of oak-bay woodland/forest (41 percent), xeric coastal scrub (30 percent), and successional grassland (22 percent). The vegetation management goal in this area is to reduce understory shrubs, particularly near structures. Steep slopes and dense tree stands may preclude mechanical treatments in some areas.

Point Pinole Regional Recreation Area

Interconnected actions in Point Pinole Regional Recreation Area would be implemented within areas totaling 478.4 acres, primarily consisting of coastal prairie (46 percent) and eucalyptus forest/plantation (43 percent). The primary vegetation management goal here is to minimize torching potential by limbing mature trees and removing eucalyptus trees smaller than eight inches in diameter. Methods would include prescribed burns in eucalyptus understory and open

grassland areas with revegetation of perennial shrub/grass mixes. Since the Point Pinole Regional Recreation Area is outside of the range of federally listed species, the vegetation management activities are not included in the action area for the proposed project and are not covered under this biological opinion.

Redwood Regional Park

Interconnected actions in Redwood Regional Park would be implemented within areas totaling 105.0 acres, consisting primarily of coniferous forest/plantation (34 percent), eucalyptus forest/plantation (33 percent), and oak-bay woodland/forest (13 percent). Vegetation management activities would include removal and/or pruning of eucalyptus trees and removal and/or thinning of shrubs. Mechanical and hand labor methods would be used.

Sibley Volcanic Regional Preserve

Interconnected actions in Sibley Volcanic Regional Preserve would be implemented within areas totaling 118.4 acres, consisting primarily of eucalyptus forest/plantation (53 percent), oak-bay woodland/forest (27 percent), and xeric coastal scrub (8 percent). Vegetation management would include removal of eucalyptus trees and reduction of shrubs. All treatment methods (including grazing) would be used, but steep slopes may preclude mechanical methods in some areas. Trees and shrubs would be removed around pallid manzanita plants where they occur, using hand labor and other measures described in the *Conservation Measures* section.

Sobrante Ridge Regional Preserve

Interconnected actions in Sobrante Ridge Regional Preserve would be implemented within areas totaling 14.3 acres, consisting primarily of oak-bay woodland/forest (59 percent) and California annual grassland (35 percent). The vegetation management goal in this area is to promote pallid manzanita by pruning trees and other plants near pallid manzanita plants. Hand labor would be used in areas of pallid manzanita along with other measures described in the *Conservation Measures* section.

Temescal Regional Recreation Area

Interconnected actions in Temescal Regional Recreation Area would be implemented within areas totaling 1.5 acres and consisting of developed/disturbed/landscaped (60 percent) and oak-bay woodland/forest (40 percent). The primary vegetation management goal is to create defensible space around Beach House. Hand labor would likely be used, but all treatment methods (except prescribed burns) are proposed.

Tilden Regional Park

Interconnected actions in Tilden Regional Park would be implemented within areas totaling 414.3 acres, consisting primarily of eucalyptus forest/plantation (58 percent), oak-bay woodland/forest (15 percent), and coniferous forest/plantation (6 percent). Vegetation management activities would include removing forest litter, dead bark, small diameter trees and

branches, and understory shrubs. Eucalyptus would be thinned to approximately 25-foot spacing, selecting for removal those eucalyptus around developed oak-bay woodlands. Pines and other coniferous trees would be removed or pruned in some areas. Invasive species would be removed and controlled. All treatment methods are possible, including prescribed burns in some areas. In areas where pallid manzanita occurs, trees and other plants near pallid manzanita plants would be pruned using hand labor, and other measures described in the *Conservation Measures* section would be implemented.

Wildcat Canyon Regional Park

Interconnected actions in Wildcat Canyon Regional Park would be implemented within areas totaling 56.6 acres, consisting primarily of eucalyptus forest/plantation (47 percent) and oak-bay woodland/forest (22 percent). Vegetation management activities would include thinning eucalyptus trees in patches to promote native grasses and scrub, removal of understory shrubs in some areas, removal of all decadent or hazardous pines, and removal of all large or leaning eucalyptus near homes. All treatment methods are possible, including prescribed burns in some areas.

Conservation Measures

To avoid and minimize the effects of the proposed project on the California red-legged frog, Alameda whipsnake, and pallid manzanita, the applicants would implement the conservation measures summarized below during vegetation management and follow-up maintenance activities. The conservation measures are organized in the following order: (1) general BMPs; (2) MMPs; (3) measures specific to herbicide application; (4) measures related to biological monitors; and (5) species specific measures.

BMPs

Standard BMPs would be implemented during operations to avoid and minimize adverse effects on the California red-legged frog, Alameda whipsnake, pallid manzanita, and biological resources. Species-specific BMPs for the protection of special status species are discussed in this section. These include guidelines for herbicide use developed by the CDPR and, where applicable, restrictions imposed by the injunction issued on October 20, 2006 by the U.S. District Court for the Northern District of California for the protection of the California red-legged frog (http://www.cdpr.ca.gov/docs/endspec/rl_frog/index.htm).

Standard BMPs include, but are not limited to:

1. The applicants would use existing strategic fire roads to the maximum extent possible. However, some temporary access routes and skid trails would be needed and would be anticipated to return to existing conditions within one year. The access routes would avoid scrub habitat, primary constituent elements for the designated critical habitat of the Alameda whipsnake, and stream and riparian habitats. New skid trails would be on firm, well-drained soils, and grades would typically be less than 15 percent. Where steep grades are unavoidable, grade breaking techniques and soil-stabilization practices would

be implemented. Temporary access routes may be constructed to extract downed materials. Detailed locations of skid directions and skid landings are available only for EPRPD's Claremont Canyon treatment area. Most of the work in other park areas would be conducted from existing roads and access points.

2. All material stockpiling and staging areas would be located within designated disturbed/developed areas that are outside of sensitive habitat areas as determined by the Service- and/or NMFS-approved biological monitor(s) and/or the Service/NMFS.

3. Project-related vehicles would observe a 15 mile-per-hour speed limit in all project areas, except on City or County roads, and State and Federal highways. Off-road traffic outside of designated project areas would be prohibited.

4. To avoid and/or minimize attracting predators to the site, all food-related trash items, such as wrappers, cans, bottles, and food scraps would be disposed of in a securely covered container. These containers would be emptied, and debris removed from the project site at the end of each working day.

5. The spread or introduction of exotic plant species would be reduced by minimizing soil disturbance to areas during and following fuel reduction treatments. Additionally, each area would be inspected for evidence of severe erosion as a result of vegetation management. If severe erosion is occurring at a site, only native plant seeds or stock shall be used for erosion control, unless otherwise approved by the Service. If necessary, fencing, signs, maintenance, access control, jute fabric, sediment traps, mulch, straw wattles (without plastic monofilament netting), vegetation management, exotic species control, or any other commonly used erosion control technique may be used to promote the ecological health of the sites.

6. BMPs, as identified by the San Francisco Bay Regional Water Quality Control Board, would be implemented to control erosion during and after vegetation removal. Erosion control BMPs would include, but are not limited to:

    a. Leaving tree stumps and/or root systems in place until vegetation becomes re-established in logged areas.

    b. Installing storm drain protection prior to vegetation management for project sites near storm drains.

    c. Placing a deep bed of chips around tree stumps to allow mechanical skidders to travel above the chip bed.

    d. Using chipped biomass, whole boles retained behind stumps, to create sediment traps roughly following the slope contours.

e. Avoiding operation of heavy equipment on slopes steeper than 35 percent, and developing specific measures to minimize effects of erosion if such areas are unavoidable.

f. Stabilizing all construction entrances and exits to control erosion and sediment discharges from the sites.

g. Cleaning and maintaining streets and roads in such a manner as to prevent unauthorized non-stormwater discharges from reaching surface water or municipal separate stormwater sewer system (MS4) drainage systems.

h. Selecting mechanical treatments according to a site's topography, access, vegetation type, and potential for environmental impacts.

7. Vehicle and heavy equipment refueling and maintenance would only be permitted in designated disturbed/developed areas where accidental spills can be immediately contained. All project-related heavy equipment shall be regularly maintained to avoid fluid leaks (*e.g.*, gasoline, diesel fuel, hydraulic fluid). All leaking fluid shall be stopped or captured in a container until such time that the equipment can be immediately moved off-site and repaired. Storage of hazardous materials shall not occur within 500 feet of any pond or creek drainage. A plan shall be prepared for immediate containment and clean-up of hazardous material spills within or adjacent to each site. Further water quality BMPs include, but are not limited to:

   a. Avoiding crossing drainage areas with running or standing water with mechanical equipment while water is present.

   b. Complying with National Pollutant Discharge Elimination System (NPDES) stormwater permitting requirements and preparing Stormwater Pollution Prevention Plans (SWPPP).

   c. Applying herbicide to tree stumps and re-sprouts by hand during dry weather and low wind conditions.

   d. Using hand-fellers for trees within 50 feet of a drainage channel; these trees would be felled perpendicular to the ephemeral drainage, and processing would be done by a skidder, if the skidder could safely handle stems at a 50-foot distance from drainage, otherwise, the trees would be lopped and scattered by hand fellers.

   e. Locating landings to accommodate skidding distances of up to 1,000 feet; for landings near streams, residue piles, *i.e.* sawdust, field chipping, residue, etc., will be placed away from drainages where runoff may wash residue into streams or wetlands.

f. Avoiding skidding across dry or running streams; when that is not possible, temporary crossings will be used during the dry season while ephemeral creeks are dry.

g. Taking all necessary safeguards to prevent sedimentation into watercourses during all phases of construction.

h. Avoiding operating mechanical equipment within the stream buffer zone and where such impact is unavoidable, employing standard BMPs to mitigate disturbance.

MMPs

MMPs have been drafted by each applicant for their treatment areas in coordination with permitting agencies, including (but not limited to) the Service, U.S. Army Corps of Engineers, San Francisco Bay Regional Water Quality Control Board, and CDFW (UCB 2013, Oakland 2013, EBRPD 2013). The purpose for the MMP is to provide treatment performance guidelines and resource protection for each vegetation type in order to achieve the goals and objectives that are critical to reducing potential hazards from wildfires in the project area. The MMPs would ensure that the implementation of the treatments would continue to reduce wildfire risk and promote species habitat by restoring native vegetation communities where applicable.

The MMPs would rely on recruitment of native vegetation into the areas where non-native trees have been removed from the overstory canopy. Hydroseeding may be used as an erosion control BMP but is not intended to serve as a floral introduction for the purpose of revegetation. Rather, hydroseeding would be used as an adaptive management technique in areas at risk of surface erosion from surface rainwater runoff or in some cases, in areas that fail to establish native vegetative cover under natural recruitment. Seed sources of native grasses, shrubs, and trees are regionally abundant and would be used to assist in the recovery of the areas towards the proposed vegetative goals.

The MMPs would include monitoring of vegetation management goals through assessing the succession of vegetation within each habitat type. Monitoring would be conducted annually, and the results would be addressed in an annual report, submitted to appropriate agencies, including the Service, by March 31 of each year. The reports would include a summary of the maintenance and monitoring activities, recovery, percent cover of federally listed species habitat, measures implemented at each site to aid in the recovery of the habitat towards the vegetation management goal outlined in the plan, and a summary of the proposed follow-up action for the upcoming year. The report would also include incidental observations of wildlife, comparative photos of the sites, assessment of vegetation criteria attained, and suggestions for future adaptive management. Photographic documentation would be conducted before and after implementation using established photo point stations and camera angles.

Service-approved habitat performance standards for the 10-year monitoring period will be developed by each applicant prior to project implementation. During the 10-year project monitoring period, should success criteria not be achieved at the projected rate, adaptive

management practices and additional measures would be implemented to improve progress towards the vegetation management goals. This could include more frequent maintenance projects, new methods or techniques for control, and higher performance objectives for successive years. The adaptive actions would be determined annually through an analysis of data collection and review of photographic documentation. Treatment areas may be assessed individually, and adaptive measures would be implemented to move towards attainment of the vegetation management goals identified for each treatment area. Non-native invasive control and native species revegetation success criteria are provided in each applicant's MMP along with measures to be taken if criteria are not met, and a discussion of the adaptive management process (UCB 2013, Oakland 2013, EBRPD 2013).

Herbicide Application

All rules, regulations, best practices and restrictions as imposed by the CDPR would be followed during herbicide application (http://www.cdpr.ca.gov/). In addition, all instructions, restrictions, use limitations, and disposal/spill remediation methods described on each herbicide label shall be followed. Also to be implemented, where applicable, are the specific restrictions imposed by the injunction issued on October 20, 2006, by the U.S. District Court for the Northern District of California for the protection of the California red-legged frog and associated habitats (http://www.cdpr.ca.gov/docs/endspec/rl_frog/index.htm).

The recommendation of a 60-foot no-use zone is the single exception to the general pesticide application guidelines presented by the CDPR referenced above. CDPR recommends implementation of a 100-foot no-use zone to protect surface waters. The recommended 60-foot no-use zone is based on information obtained from the website http://www.cdpr.ca.gov/docs/endspec/rl_frog/index.htm. This no-use zone was imposed over certain areas by the U.S. District Court for the Northern District of California. Some of these no-use zones intersect with the proposed project area and are intended for the protection of the California red-legged frog. California red-legged frog habitat may occur throughout the project area, and therefore, it is reasonable to apply similar conditions on herbicide application throughout the proposed project area. The implementation of the 60-foot no-use zone required for protection of the California red-legged frog is believed to be adequately protective of all aquatic receptors that may occur in project area surface waters, including special status species (*e.g.*, salmonid fish) and aquatic prey items important for the survival of special status species.

The key conditions related to herbicide application include:

1. A 60-foot buffer zone adjacent to standing or flowing water would be established within which there would be no foliar application of herbicides. Within the 60-foot buffer, as well as areas greater than 60 feet from surface waters but where there is potential for herbicides to reach aquatic habitats via runoff or drift, only aquatic-safe formulations of herbicides would be used (*e.g.*, Garlon 3A), and the more toxic Garlon 4 Ultra would not be used.

2. Herbicides will be applied directly to stumps, and foliar application will not be used in any areas subject to potential drift to surface water bodies. Stump

application of all herbicides would be conducted by a State of California Qualified Applicator or by staff under their supervision. Within the 60-foot stream buffer, cut stump application of approved herbicides would be applied within 60 minutes of felling. Although herbicide transport to surface waters is unexpected with the implementation of BMPs, the more toxic Garlon 4 Ultra herbicide will not be used in areas within 60 feet of standing or flowing water or with potential for runoff or drift to surface water bodies. In these areas only aquatic-safe formulations of herbicides would be used (*e.g.*, Garlon 3A).

3. Herbicides will not be applied within 24 hours of predicted rain events (40 percent chance or greater for rainfall) to reduce the potential for runoff of herbicides into surface water bodies.

4. Foliar application of herbicides or other spray application methods will not be applied when wind speeds exceed 10 miles per hour to reduce likelihood of drift into surface water bodies.

5. Additional conditions for the protection of pallid manzanita include conducting surveys for plants prior to herbicide application; the establishment of clearly marked protective buffers sufficient in size to ensure pallid manzanita plants are protected from spraying and spraying drift (at least 32.8 feet around each plant); and the avoidance of use of a fine spray, which is more prone to drift and is more toxic than larger droplets at low application rates.

6. Chemical treatment shall be conducted in accordance with a Service- and NMFS-approved treatment plan.

7. Contractors must have all necessary licensing by CDPR for herbicide application. Use of herbicides shall be consistent with label instructions and Material Safety Data Sheets documents shall be maintained.

8. Integrated Pest Management Approaches: Applicants would also use non-chemical methods such as hand pulling or chip deposition on seed stock to prevent seedling germination, thus reducing the need for herbicides.

9. A liquid herbicide would be applied to each cut tree stump within 60 minutes of felling; a typical tree requires 1 to 2 ounces of diluted solution, which must be applied to the cambium layer, directly beneath the bark. The cut stump formulation may be diluted or adjusted when, at the judgment of the project manager, the rate of material used may exceed the amount allowable per acre per year, by U.S. Environmental Protection Agency regulations.

10. Drift from foliar application will be avoided by implementing measures, such as avoiding windy days (*e.g.*, avoid spraying when wind speeds are more than 10 miles per hour) and using proper spraying techniques, and following all CDPR regulations. Herbicide would only be applied by hand during dry weather and low wind conditions, and a back sprayer

would be used to selectively apply herbicide to the young foliage of re-sprouted eucalyptus.

11. Herbicide applications would be rotated for best impact during the growing season. The lowest effective concentration needed for effectiveness would be used, typically specified as a range on the product label. Note that concentration is dependent on method of application: cut stump mixtures are more highly concentrated than foliar mixtures.

12. No herbicides would be intentionally applied to non-target species.

13. All containers would be labeled according to CDPR regulations.

14. All containers would be disposed of according to CDPR regulations.

15. All materials would be stored according to CDPR regulations.

16. All materials used would be recorded and reported per CDPR regulations.

17. Because the restrictions on use are so numerous and species/application dependent, the label instructions or CDPR website would be consulted for a complete (and evolving) set of use guidelines and restrictions.

18. The areas chemically treated would include areas up to the ordinary high water mark of ephemeral streams. Foliar application of herbicides would not occur within 60 feet of standing or flowing water. Only cut stump application of Service-approved herbicides (*e.g.*, Garlon 3A, Stalker, and Roundup, but not Garlon 4 Ultra) would occur within 60 feet of standing or flowing water.

Service-Approved Biological Monitor

As part of the effort to avoid and minimize potential effects to federally listed species and their habitats, a Service-approved biological monitor would be made available to be onsite and/or on-call during project implementation activities. The Service-approved biological monitor would adhere to the following measures:

1. At least 20 working days prior to the date that the project is initiated in the field, the applicant or project proponent shall submit the name(s) and credentials of biological monitors who would serve as the onsite project biological monitors to the Service for review and approval. The biological monitor(s) shall have demonstrated knowledge of the biology, ecology, and field experience identifying Alameda whipsnakes and California red-legged frogs, as well as botanical knowledge in regards to the pallid manzanita. No project activities shall begin until the applicant or project proponents have received written approval from the Service that the biological monitor(s) are qualified to conduct the work. Information included in a request for authorization as a Service-approved biological monitor should include, at a minimum: (1) relevant education; (2) relevant training on species identification, survey techniques, handling individuals of

different age classes, and handling of different life stages by a permitted biologist or recognized species expert authorized for such activities by the Service; (3) a summary of field experience conducting requested activities (to include project/research information); (4) a summary of biological opinions under which they were authorized to work with the listed species and at what level (such as construction monitoring versus handling), including the names and qualifications of persons under which the work was supervised as well as the amount of work experience on the actual project; (5) a list of Federal Recovery Permits [10(a)1(A)] held or under which are authorized to work with the species (to include permit number, authorized activities, and name of permit holder); and (6) any relevant professional references with contact information. The Service will provide written approval within 10 business days of receipt of the provided information.

2. The Service-approved biological monitor(s) shall be onsite during implementation of project activities that may result in take of federally listed species. Additionally, the biological monitor would be given the authority through communication with the project manager or their designee to stop any work that may result in take of the California red-legged frog, Alameda whipsnake, and/or other listed species. If the Service-approved biological monitor exercises this authority, the Service shall be notified by telephone and electronic mail within one (1) working day. The Service contact is the Coast Bay/Forest Foothills Division Chief, Endangered Species Program, at the Sacramento Fish and Wildlife Office at telephone (916) 414-6600.

3. The Service-approved biological monitor(s) would be onsite to monitor the initial vegetation removal and/or ground disturbance activities. The Service-approved biological monitor(s) shall perform a clearance survey for listed species immediately prior to the initial ground disturbance.

4. An employee education program on the federally listed species shall be completed prior to the date of initial groundbreaking or vegetation clearing (whichever date comes first) at the project. The program shall consist of a brief presentation by the Service-approved biological monitor(s) to explain threatened and endangered species issues to all contractors, their employees, and agency personnel involved in the implementation of the project. The program shall include a description of the federally listed species and their habitat needs; an explanation of the status of these species and their protection under the Act; associated consequences of non-compliance with this opinion; and a description of the measures being taken to reduce effects to these species during project implementation.

5. Based on training from the biological monitor, all contractors, their employees, and agency personnel involved in the implementation of the project will check for the presence of Alameda whipsnakes or California red-legged frogs next to stationary vehicles, prior to operating the vehicles. If found, the biological monitor will be contacted prior to operating the vehicle. The biological monitor will contact the Service immediately if an Alameda whipsnake or California red-legged frog is found, to determine necessary steps.

6. If the Service-approved biological monitor(s) observed either the Alameda whipsnake or California red-legged frog in the work area, they will stop work and move the Alameda whipsnake and California red-legged frog to a safe location within walking distance of the location where it was found; or if possible, the Alameda whipsnake or California red-legged frog would be allowed to disperse on its own. The individual animal would be monitored by the Service-approved biological monitor until it has been determined that it is not imperiled by predators or other dangers. Neither of these two listed species shall be moved to laboratories, holding facilities, or other facilities without the written authorization of the Service.

7. The Service-approved biological monitor(s) may use nets or their bare hands to capture California red-legged frogs at the project site. The Service-approved biological monitors(s) shall not use soaps, oils, creams, lotions, repellents, or solvents of any sort on their hands within two hours before and during periods when they are capturing and relocating the California red-legged frog or Alameda whipsnake. The Service-approved biological monitors(s) shall limit the duration of handling and captivity of individual California red-legged frogs and Alameda whipsnakes. The Service-approved biological monitor will minimize the potential for infecting California red-legged frogs with amphibian diseases when capturing and relocating these amphibians by implementing the measures in *The Declining Amphibian Task Force Fieldwork Code of Practice* (available at the Ventura Fish and Wildlife Office's website at http://www.fws.gov/ventura/species_information/protocols_guidelines/docs/DAFTA.pdf). While in captivity, individuals of the California red-legged frog shall be kept in a cool, moist, aerated environment, such as a bucket containing a damp sponge. Containers used for holding or transporting adults of the amphibian shall not contain any standing water. The Alameda whipsnake shall be placed in a pillowcase or similar container for transport to the release site.

8. If the Service-approved biological monitor exercises stop work authority, the Service would be notified by telephone and electronic mail within one working day. The Service-approved monitor shall be the contact for any employee or contractor who might inadvertently kill or injure a California red-legged frog and/or an Alameda whipsnake; or anyone who finds a dead, injured, or entrapped individual of these two listed species. The Service-approved biological monitor shall possess a working cellular telephone whose number would be provided to the Service.

9. Sensitive habitat areas, including Alameda whipsnake and California red-legged frog habitat, known populations of pallid manzanita, and wetlands shall be clearly indicated on the project plans. These plans would be submitted to the Service for review and approval prior to project implementation.

10. Following approval of plans identifying sensitive habitat by the Service, sensitive areas shall be delineated with high visibility, temporary, orange-colored fence at least four feet in height, flagging, or other barriers. These areas will be avoided under supervision of the biological monitor.

11. During work activities, ground burrows, holes, and tunnels that provide shelter for small animals will be avoided under supervision of the biological monitor.

Species-Specific Work Windows and Additional Measures

In coordination with the Service, work windows have been developed during which the proposed project would be implemented to avoid effects to the California red-legged frog and Alameda whipsnake. Minor vegetation removal activities using hand labor that are unlikely to injure California red-legged frogs or Alameda whipsnakes can be implemented during the course of the year with proper BMPs in place. Major ground disturbing activities and use of heavy machinery require consideration of appropriate work windows for each species, resulting in an open work window to occur between August 1 and November 30. This time frame would also address the work windows for avoiding nesting migratory birds (February-July), hibernating Alameda whipsnakes (November 1 - March 31), and would avoid the wet season for the California red-legged frog (October 15 – May 15). Although November 1 is typically the start of the wet season, the potential for injuring dispersing California red-legged frogs will be minimized by installing exclusion fencing prior to the start of the wet season and avoiding work in dispersal habitat on days with a 40 percent or greater chance for rainfall. Additionally, because Alameda whipsnakes begin hibernating in November, any activities that may crush burrows will be avoided by not allowing the use of heavy equipment within or near suitable Alameda whipsnake habitat from November 1 through March 31. Additional considerations for species and work windows are provided in the subsections below.

Additional Measures Specific to California Red-Legged Frog

1. To the extent practicable, treatment activities involving heavy equipment and or significant ground disturbance shall not occur between April 15 and August 1 within any areas determined to be suitable California red-legged frog breeding habitat (aquatic habitat plus a 60-foot linear buffer) or where the species is deemed present by the biological monitor, to avoid potential disturbance to breeding California red-legged frogs.

2. In areas where herbicides will be applied within 60 feet of the Ordinary High Water Mark of areas determined to be suitable California red-legged frog breeding habitat, only aquatic-safe formulations of herbicides (*e.g.*, Garlon 3A) will be used, and they will be applied only by brushing directly onto stumps. Herbicide use in these areas will be limited to August 1 to October 31 to avoid potential impacts to California red-legged frog tadpoles, egg masses, and dispersing adults. No foliar application of herbicides would occur within 60 feet of breeding habitat for the California red-legged frog or in any areas subject to potential drift to breeding habitat for the California red-legged frog. Species-specific BMPs for the protection of California red-legged frog and associated habitats are also discussed in Appendix E of the Biological Assessment (FEMA 2012), and these are based on application restrictions imposed by the injunction issued on October 20, 2006 by the U.S. District Court for the Northern District of California.

3. Exclusion fencing: In areas with potential or known occurrences of the California red-legged frog, exclusion fencing will be installed (prior to the start of the wet season) to

prevent the California red-legged frogs from entering an active vegetation treatment area. The exclusion fencing would consist of geotextile fabric with one-way exit funnels every 100 feet. The geotextile fabric would be ERTEC-E or equivalent as approved by the Service prior to installation. The lower portion of the fence would be buried to a depth of 4 to 6 inches, and the top of the fence would extend at least 36 inches above ground level. Shrubs within approximately 3 feet of the outside of the fence would be trimmed to prevent access via the shrubs over the fence. The fence would be secured to metal posts and/or wooden stakes to ensure it remains upright and does not fall over. Posts/stakes would be placed on the inner side of the fence to ensure Alameda whipsnakes do not enter the work site by climbing the posts/stakes. A Service-approved biological monitor would be onsite during installation of the fencing to relocate any listed species to outside the construction area. The biological monitor will survey the work area daily to ensure the fencing is secure and that no listed species are trapped inside or along the outside perimeter. The fencing would be continuously maintained until all construction activities are completed. After construction has been completed, the exclusion fencing would be removed.

Additional Measures Specific to Alameda Whipsnake

1. Treatment activities involving heavy equipment and or significant ground disturbance within any areas determined to be suitable Alameda whipsnake habitat would not occur between November 1 and March 31 to avoid potential disturbance to hibernating Alameda whipsnakes. Treatments involving hand crews, light mechanical equipment, or prescribed burning can be implemented during the course of the year with proper BMPs in place.

2. Exclusion fencing would be installed around all areas where heavy equipment is operated, including landing areas, access roads, and staging areas. Following project implementation, fencing will be removed. See details above on exclusion fencing.

3. Skid trails would be sited a minimum of 10 feet away from Alameda whipsnake core scrub habitat and rock outcrops.

4. Rock outcroppings and native shrubs within 50 feet of rock outcrops would be maintained and protected from vehicles using orange construction fencing.

5. Wood chips and landings would not be placed within 50 feet of rock outcrops.

6. EBRPD will develop, implement, and fund a Service-approved study of the effects of the proposed treatment activities (*e.g.*, shrub thinning) on the Alameda whipsnake.

7. EBRPD will compensate at a 2:1 ratio for the permanent loss of 193.1 acres of core scrub habitat for the Alameda whipsnake by purchasing, preserving, and managing in perpetuity under a conservation easement at least 386.2 acres of suitable core scrub habitat for the Alameda whipsnake at Service-approved location(s) within its designated critical habitat. The preserved habitat will be managed for the benefit of the Alameda

whipsnake under a Service-approved compensation plan with a long-term endowment to provide funding for management of these areas in perpetuity. Currently, EBRPD is considering purchasing and preserving in perpetuity under a conservation easement high quality core scrub habitat within an important dispersal corridor within Alameda whipsnake designated critical habitat Unit 6.

Avoidance Measures to be Implemented During Pile Burning

The following is a list of BMPs for pile burning that would be taken when burning piles at all sites with potential Alameda whipsnake habitat that are not isolated and are connected to known sites or quality sites with rock outcroppings:

1. Check for burrows before building piles. Avoid placing piles on large rodent burrows;

2. Light the pile from one end (generally the uphill side on slopes) to allow Alameda whipsnakes to escape, rather than lighting the whole pile at once;

3. Limit material in the pile to 4-inch diameter or less to limit heat penetration into the ground and provide short escape distance;

4. Pile burning would not occur within suitable Alameda whipsnake habitat during the hibernation season (November 1 – March 31).

5. No heavy equipment that could collapse burrows within suitable habitat for potential Alameda whipsnake would be used during the hibernation period (November 1 – March 31).

Additional Measures Specific to Pallid Manzanita

1. Prior to conducting activities within RTAs that support *Arctostaphylos* species, a Service-approved biologist familiar with identifying *Arctostaphylos* species and their hybrids, will train all project staff regarding habitat sensitivity, identification of pallid manzanitas and their hybrids, and these minimization, avoidance, and compensation measures.

2. No *Arctostaphylos* species, within any project area, will be removed without verification from the Service-approved biologist that the *Arctostaphylos* species in question is not a pallid manzanita.

3. No living pallid manzanitas, as determined by the Service-approved biologist and the presence of any photosynthesizing leaves, will be removed or damaged.

4. No pallid manzanita branches supporting photosynthesizing leaves will be cut, removed, or damaged.

5. All shrubs and trees that are not a component of the maritime chaparral vegetation type within 20 feet of pallid manzanita plants and all shrubs or trees that are excessively

shading pallid manzanita plants (*i.e.*, pines, acacias, eucalyptus, oak, bay, madrone, etc.) will be cut and treated to reduce competition with pallid manzanitas and to reduce fuel loads.

6. Prior to any fuel reduction activities within pallid manzanita stands, the stand will be surveyed for mature and seedling (less than five years of age) pallid manzanitas, except within 25 feet of where *Phytophthora cinnamomi* has been identified. All adults and seedlings will be flagged with high visibility flagging and avoided.

7. Herbicide use within 300 feet of pallid manzanitas will be applied through direct application to the stump only.

8. Goat grazing is prohibited within treatment areas containing pallid manzanitas.

9. EBRPD Pallid Manzanita Management Plan: Prior to implementing any activity within any RTA containing pallid manzanitas, EBRPD will develop a Service-approved long-term adaptive management plan for all stands of pallid manzanitas that occur on EBRPD lands (nearly 75 percent of pallid manzanita plants range-wide occur on EBRPD lands and thus will be covered under this management plan) (ESA 2013). The plan will be designed to ensure the long-term persistence of the pallid manzanita stands and to guide future management actions in and around this species including: (1) managing and expanding existing pallid manzanita stands in such a way as to maximize individual plant health, maintain species genetic integrity and diversity, and promote stand regeneration in perpetuity; (2) establishing or restoring additional pallid manzanita stands in areas that are not subject to fuel management or other incompatible uses; and (3) controlling the spread of the fungal pathogen, *P. cinnamomi*, within and between pallid manzanita stands. The general recommendations in the Draft EBRPD Pallid Manzanita Management Plan (ESA 2013) include: (1) updating and monitoring the status of pallid manzanita populations; (2) seed banking for all naturally occurring populations of pallid manzanita, focusing on representative genetic diversity; (3) recreational user and neighborhood education and outreach to minimize the spread of *P. cinnamomi*; (4) removal of non-native vegetation and other native vegetation that threaten to outcompete the pallid manzanita; (5) conducting studies and implementing measures to enhance germination of pallid manzanitas; (6) outplanting of propagated pallid manzanita plants and/or direct seeding; (7) conducting prescribed fire; and (8) controlling *P. cinnamomi*.

To reduce the spread of *P. cinnamomi* within the RTAs containing pallid manzanita plants, the following minimization and avoidance measures will be implemented:

1. Each year or prior to any wildfire hazard reduction activities within a watershed supporting pallid manzanitas, an appropriately timed survey of the site to be treated will be conducted by a qualified person approved by the Service to identify areas infected with *P. cinnamomi*.

2. Work within 100 feet of any area known to be infected with *P. cinnnamomi* will be scheduled to occur after all other areas within 500 feet of the infection have been treated.

3. A specific ingress/egress route, that minimizes the potential spread of *P. cinnamomi*, will be identified by a Service-approved biologist when working within watersheds that support pallid manzanitas.

4. A wash station will be established at the ingress/egress location. Prior to entering or exiting the ingress/egress location, any potentially contaminated material will be removed from all boots, hand tools, clothing, and other equipment, then these items will be disinfected using 70 percent isopropanol (rubbing alcohol) or another Service-approved substance known to disinfect *P. cinnamomi* contaminated equipment.

5. All work within 300 feet or upslope of pallid manzanitas will be conducted using hand-tools only.

6. Vehicles are prohibited off of service-roads within 200 feet of pallid manzanitas.

7. No treatment activities, except for pile burning, will be conducted during the wet season (October 15 to May 15) within RTAs containing pallid manzanitas.

8. Pile burning will not occur within 100 feet of any area infected with *P. cinnamomi* during the wet season (October 15 to May 15).

9. Within watersheds that support pallid manzanitas, the transportation of wood, slash, and other debris will only be conducted under the guidance of a Service-approved biologist and in a manner that minimizes the potential spread of *P. cinnamomi.*

10. Prior to conducting any activities within watersheds that support pallid manzanitas, all personnel will attend an environmental awareness training session designed to inform workers about the long-term effects of *P. cinnamomi*, how it is spread, and these minimization and avoidance measures.

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 purposes of the effects assessment, the action area encompasses all of the proposed project activities and interrelated and interdependent activities that may result in direct or indirect effects to federally listed species and designated critical habitat. In addition to the proposed project funded through the four FEMA grants identified in Table 1, FEMA has agreed to include in this formal consultation interconnected actions in the action area (Table 2) that will be implemented as part of EBRPD's WHRRMP (LSA Associates, Inc. 2009), a 10-year monitoring plan, though Federal funding from FEMA will only be provided at this time to support a portion of the WHRRMP.

The effective action area for the proposed project is about 2,872 acres inclusive of the proposed project funded through the four FEMA grants (Table 1) and the interconnected EBRPD WHRRMP parcels (Table 2), but excluding the 22.2-acre Miller/Knox Regional Shoreline and

the 478.4-acre Point Pinole Regional Recreation Area project areas which are outside of the range of the California red-legged frog, Alameda whipsnake, and pallid manzanita. For the purposes of the effects assessment, the action area for the proposed project encompasses all areas that would be directly or indirectly affected from the implementation of the proposed project (project areas as defined in Tables 1 and 2 inclusive of access roads, staging and debris stockpiling sites), and the nearby lands that would be affected by the interconnected actions proposed in the WHRRMP. The action area also includes all streams and ponds within 500 feet downstream of proposed vegetation treatment areas that could be indirectly affected by increased turbidity and sedimentation. The action area also includes all pallid manzanita plants that occur on EBRPD lands (nearly 75 percent of all pallid manzanita plants range-wide) that will be covered under the Draft EBRPD Pallid Manzanita Management Plan (ESA 2013).

Analytical Framework for the Jeopardy Analysis

In accordance with policy and regulation, the jeopardy analyses in this biological opinion relies on four components: (1) the Status of the Species, which evaluates the range-wide conditions of the California red-legged frog, Alameda whipsnake, and pallid manzanita, the factors responsible for that condition, and their survival and recovery needs; (2) the Environmental Baseline, which evaluates the condition of these listed species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of these listed species; (3) the Effects of the Proposed Project, which determines the direct and indirect effects of the proposed Federal action and the effects of any interrelated or interdependent activities on the California red-legged frog, Alameda whipsnake, and pallid manzanita; and (4) Cumulative Effects, which evaluates the effects of future, non-Federal activities in the action area on these species.

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 California red-legged frog's, Alameda whipsnake's, and pallid manzanita's current status, taking into account any cumulative effects, to determine if implementation of the proposed project is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of these listed species in the wild.

The jeopardy analyses in this biological opinion places an emphasis on consideration of the range-wide survival and recovery needs of the California red-legged frog, Alameda whipsnake, and pallid manzanita, and the role of the action area in the survival and recovery of the California red-legged frog, Alameda whipsnake, and pallid manzanita 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.

Adverse Modification Determination

This biological opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statutory provisions of the Act to complete the following analysis with respect to critical habitat.

In accordance with policy and regulation, the adverse modification analysis in this biological opinion relies on four components: (1) the Status of Critical Habitat, which evaluates the range-wide condition of critical habitat for the Alameda whipsnake in terms of primary constituent elements (PCE)s, the factors responsible for that condition, and the intended recovery function of the critical habitat at the provincial and range-wide scale; (2) the Environmental Baseline, which evaluates the condition of the critical habitat in the action area, the factors responsible for that condition, and the recovery role of the critical habitat in the action area; (3) the of the Proposed Project, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the PCEs and how that will influence the recovery role of affected critical habitat units and; (4) Cumulative Effects which evaluates the effects of future, non-Federal activities in the action area on the PCEs and how that will influence the recovery role of affected critical habitat units.

For purposes of the adverse modification determination, the effects of the proposed Federal action on the Alameda whipsnake critical habitat are evaluated in the context of the range-wide condition of the critical habitat at the provincial and range-wide scales, taking into account any cumulative effects, to determine if the critical habitat range-wide would remain functional (or would retain the current ability for the PCEs to be functionally established in areas of currently unsuitable but capable habitat) to serve its intended recovery role for the Alameda whipsnake.

The analysis in this biological opinion places an emphasis on using the intended range-wide recovery function of Alameda whipsnake critical habitat and the role of the action area relative to that intended function 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 adverse modification determination.

Status of the Species

California Red-Legged Frog

Listing Status: The California red-legged frog was listed as a threatened species on May 23, 1996 (61 FR 25813) (Service 1996). Critical habitat was designated for this species on April 13, 2006 (71 FR 19244) (Service 2006a) and revisions to the critical habitat designation were published on March 17, 2010 (75 FR 12816) (Service 2010a). At this time, the Service recognized the taxonomic change from *Rana aurora draytonii* to *Rana draytonii* (Shaffer *et al.* 2010). A Recovery Plan was published for the California red-legged frog on September 12, 2002 (Service 2002a).

Description: The California red-legged frog is the largest native frog in the western United States (Wright and Wright 1949), ranging from 1.5 to 5.1 inches in length (Stebbins 2003). The abdomen and hind legs of adults are largely red, while the back is characterized by small black flecks and larger irregular dark blotches with indistinct outlines on a brown, gray, olive, or reddish background color. Dorsal spots usually have light centers (Stebbins 2003), and dorsolateral folds are prominent on the back. Larvae (tadpoles) range from 0.6 to 3.1 inches in length, and the background color of the body is dark brown and yellow with darker spots (Storer 1925).

Distribution: The historic range of the California red-legged frog extended from the vicinity of Elk Creek in Mendocino County, California, along the coast inland to the vicinity of Redding in Shasta County, California, and southward to northwestern Baja California, Mexico (Fellers 2005; Jennings and Hayes 1985; Hayes and Krempels 1986). The species was historically documented in 46 counties but the taxa now remains in 238 streams or drainages within 23 counties, representing a loss of 70 percent of its former range (Service 2002a). California red-legged frogs are still locally abundant within portions of the San Francisco Bay Area and the Central California Coast. Isolated populations have been documented in the Sierra Nevada, northern Coast, and northern Transverse Ranges. The species is believed to be extirpated from the southern Transverse and Peninsular ranges, but is still present in Baja California, Mexico (CDFW 2012).

Status and Natural History: California red-legged frogs predominately inhabit permanent water sources such as streams, lakes, marshes, natural and manmade ponds, and ephemeral drainages in valley bottoms and foothills up to 4,921 feet in elevation (Jennings and Hayes 1994, Bulger *et al.* 2003, Stebbins 2003). However, they also inhabit ephemeral creeks, drainages and ponds with minimal riparian and emergent vegetation. California red-legged frogs breed from November to April, although earlier breeding records have been reported in southern localities. Breeding generally occurs in still or slow-moving water often associated with emergent vegetation, such as cattails, tules or overhanging willows (Storer 1925, Hayes and Jennings 1988). Female frogs deposit egg masses on emergent vegetation so that the egg mass floats on or near the surface of the water (Hayes and Miyamoto 1984).

Habitat includes nearly any area within 1-2 miles of a breeding site that stays moist and cool through the summer including vegetated areas with coyote brush, California blackberry thickets, and root masses associated with willow and California bay trees (Fellers 2005). Sheltering habitat for California red-legged frogs potentially includes all aquatic, riparian, and upland areas within the range of the species and includes any landscape feature that provides cover, such as animal burrows, boulders or rocks, organic debris such as downed trees or logs, and industrial debris. Agricultural features such as drains, watering troughs, spring boxes, abandoned sheds, or hay stacks may also be used. Incised stream channels with portions narrower and depths greater than 18 inches also may provide important summer sheltering habitat. Accessibility to sheltering habitat is essential for the survival of California red-legged frogs within a watershed, and can be a factor limiting frog population numbers and survival.

California red-legged frogs do not have a distinct breeding migration (Fellers 2005). Adults are often associated with permanent bodies of water. Some individuals remain at breeding sites year-round, while others disperse to neighboring water features. Dispersal distances are typically less than 0.5-mile, with a few individuals moving up to 1-2 miles (Fellers 2005). Movements are typically along riparian corridors, but some individuals, especially on rainy nights, move directly from one site to another through normally inhospitable habitats, such as heavily grazed pastures or oak-grassland savannas (Fellers 2005).

In a study of California red-legged frog terrestrial activity in a mesic area of the Santa Cruz Mountains, Bulger *et al.* (2003) categorized terrestrial use as migratory and non-migratory. The latter occurred from one to several days and was associated with precipitation events. Migratory

movements were characterized as the movement between aquatic sites and were most often associated with breeding activities. Bulger *et al.* (2003) reported that non-migrating frogs typically stayed within 200 feet of aquatic habitat 90 percent of the time and were most often associated with dense vegetative cover, i.e., California blackberry, poison oak and coyote brush. Dispersing frogs in northern Santa Cruz County traveled distances from 0.25-mile to more than 2 miles without apparent regard to topography, vegetation type, or riparian corridors (Bulger *et al.* 2003).

In a study of California red-legged frog terrestrial activity in a xeric environment in eastern Contra Costa County, Tatarian (2008) noted that a 57 percent majority of frogs fitted with radio transmitters in the Round Valley study area stayed at their breeding pools, whereas 43 percent moved into adjacent upland habitat or to other aquatic sites. This study reported a peak seasonal terrestrial movement occurring in the fall months associated with the first 0.2-inch of precipitation and tapering off into spring. Upland movement activities ranged from 3 to 233 feet, averaging 80 feet, and were associated with a variety of refugia including grass thatch, crevices, cow hoof prints, ground squirrel burrows at the base of trees or rocks, logs, and under man-made structures; others were associated with upland sites lacking refugia (Tatarian 2008). The majority of terrestrial movements lasted from 1 to 4 days; however, one adult female was reported to remain in upland habitat for 50 days (Tatarian 2008). Upland refugia closer to aquatic sites were used more often and were more commonly associated with areas exhibiting higher object cover, e.g., woody debris, rocks, and vegetative cover. Subterranean cover was not significantly different between occupied upland habitat and non-occupied upland habitat.

California red-legged frogs are often prolific breeders, laying their eggs during or shortly after large rainfall events in late winter and early spring (Hayes and Miyamoto 1984). Egg masses containing 2,000 to 5,000 eggs are attached to vegetation below the surface and hatch after 6 to 14 days (Storer 1925, Jennings and Hayes 1994). In coastal lagoons, the most significant mortality factor in the pre-hatching stage is water salinity (Jennings *et al.* 1992). Eggs exposed to salinity levels greater than 4.5 parts per thousand resulted in 100 percent mortality (Jennings and Hayes 1990). Increased siltation during the breeding season can cause asphyxiation of eggs and small larvae. Larvae undergo metamorphosis 3½ to 7 months following hatching and reach sexual maturity 2 to 3 years of age (Storer 1925; Wright and Wright 1949; Jennings and Hayes 1985, 1990, 1994). Of the various life stages, larvae probably experience the highest mortality rates, with less than 1 percent of eggs laid reaching metamorphosis (Jennings *et al.* 1992). California red-legged frogs may live 8 to 10 years (Jennings *et al.* 1992). Populations can fluctuate from year to year; favorable conditions allow the species to have extremely high rates of reproduction and thus produce large numbers of dispersing young and a concomitant increase in the number of occupied sites. In contrast, the animal may temporarily disappear from an area when conditions are stressful (e.g., during periods of drought, disease, etc.).

The diet of California red-legged frogs is highly variable; changing with the life history stage. The diet of the larval stage has been the least studied and is thought to be similar to that of other ranid frogs, which feed on algae, diatoms, and detritus (Fellers 2005; Kupferberg 1996a, 1996b, 1997). Hayes and Tennant (1985) analyzed the diets of California red-legged frogs from Cañada de la Gaviota in Santa Barbara County during the winter of 1981 and found invertebrates (comprising 42 taxa) to be the most common prey item consumed; however, they speculated that

this was opportunistic and varied based on prey availability. They ascertained that larger frogs consumed larger prey and were recorded to have preyed on Pacific chorus frog, three-spined stickleback and, to a limited extent, California mice, which were abundant at the study site (Hayes and Tennant 1985, Fellers 2005). Although larger vertebrate prey was consumed less frequently, it represented over half of the prey mass eaten by larger frogs suggesting that such prey may play an energetically important role in their diets (Hayes and Tennant 1985). Juvenile and subadult/adult frogs varied in their feeding activity periods; juveniles fed for longer periods throughout the day and night, while subadult/adults fed nocturnally (Hayes and Tennant 1985). Juveniles were significantly less successful at capturing prey and all life history stages exhibited poor prey discrimination, feeding on several inanimate objects that moved through their field of view (Hayes and Tennant 1985).

Recovery Plan: The Recovery Plan for the California red-legged frog identifies eight recovery units (Service 2002a). The establishment of these recovery units is based on the determination that various regional areas of the species' range are essential to its survival and recovery. These recovery units are delineated by major watershed boundaries as defined by U.S. Geological Survey hydrologic units and the limits of its range. The goal of the recovery plan is to protect the long-term viability of all extant populations within each recovery unit. Within each recovery unit, core areas have been delineated and represent contiguous areas of moderate to high California red-legged frog densities that are relatively free of exotic species such as bullfrogs. The goal of designating core areas is to protect metapopulations. Thus when combined with suitable dispersal habitat, will allow for the long term viability within existing populations. This management strategy identified within the Recovery Plan will allow for the recolonization of habitats within and adjacent to core areas that are naturally subjected to periodic localized extinctions, thus assuring the long-term survival and recovery of California red-legged frogs.

Threats: Habitat loss, non-native species introduction, and urban encroachment are the primary factors that have adversely affected the California red-legged frog throughout its range. Several researchers in central California have noted the decline and eventual local disappearance of California and northern red-legged frogs in systems supporting bullfrogs (Jennings and Hayes 1990; Twedt 1993), red swamp crayfish, signal crayfish, and several species of warm water fish including sunfish, goldfish, common carp, and mosquitofish (Moyle 1976; Barry 1992; Hunt 1993; Fisher and Schaffer 1996). This has been attributed to predation, competition, and reproduction interference. Twedt (1993) documented bullfrog predation of juvenile northern red-legged frogs, and suggested that bullfrogs could prey on subadult California red-legged frogs as well. Bullfrogs may also have a competitive advantage over California red-legged frogs. For instance, bullfrogs are larger and possess more generalized food habits (Bury and Whelan 1984). In addition, bullfrogs have an extended breeding season (Storer 1933) during which an individual female can produce as many as 20,000 eggs (Emlen 1977). Furthermore, bullfrog larvae are unpalatable to predatory fish (Kruse and Francis 1977). Bullfrogs also interfere with California red-legged frog reproduction by eating adult male California red-legged frogs. Both California and northern red-legged frogs have been observed in amplexus (mounted on) with both male and female bullfrogs (Jennings and Hayes 1990; Twedt 1993; Jennings 1993). Thus bullfrogs are able to prey upon and out-compete California red-legged frogs, especially in sub-optimal habitat.

The urbanization of land within and adjacent to California red-legged frog habitat has also affected the threatened amphibian. These declines are attributed to channelization of riparian areas, enclosure of the channels by urban development that blocks dispersal, and the introduction of predatory fishes and bullfrogs. Diseases may also pose a significant threat, although the specific effects of disease on the California red-legged frog are not known. Pathogens are suspected of causing global amphibian declines (Davidson *et al.* 2003). Chytridiomycosis and ranaviruses are a potential threat because these diseases have been found to adversely affect other amphibians, including the listed species (Davidson *et al.* 2003; Lips *et al.* 2006). Mao *et al.* (1999 cited in Fellers 2005) reported northern red-legged frogs infected with an iridovirus, which was also presented in sympatric threespine sticklebacks in northwestern California. Non-native species, such as bullfrogs and non-native tiger salamanders that live within the range of the California red-legged frog have been identified as potential carriers of these diseases (Garner *et al.* 2006). Humans can facilitate the spread of disease by encouraging the further introduction of non-native carriers and by acting as carriers themselves (i.e., contaminated boots, waders or fishing equipment). Human activities can also introduce stress by other means, such as habitat fragmentation, that results in the listed species being more susceptible to the effects of disease.

Alameda Whipsnake

The November 2002 *Draft Recovery Plan for Chaparral and Scrub Community Species East of San Francisco Bay, California* includes the Alameda whipsnake, pallid manzanita, and four species of concern (http://ecos.fws.gov/docs/recovery_plan/030407.pdf, Service 2002b). The draft recovery plan is currently being revised by the Service. For the current Status of the Species, refer to the *Alameda Whipsnake (Masticophis lateralis euryxanthus) 5-Year Review: Summary and Evaluation* (http://ecos.fws.gov/docs/five_year_review/doc3886.pdf, Service 2011).

Alameda Whipsnake Critical Habitat

On October 2, 2006, the final rule designating critical habitat for the Alameda whipsnake was published in the Federal Register (Service 2006b). When designating critical habitat, the Service is required to list the known PCEs together with the critical habitat description. Such physical and biological features include, but are not limited to, space for individual and population growth and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, rearing (or development) of offspring; and habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species (Service 2005).

The rule identifies approximately 154,834 acres within six critical habitat units based on three PCEs: (1) scrub/shrub communities with a mosaic of open and closed canopy; (2) woodland or annual grassland plant communities contiguous to lands containing PCE 1; and (3) lands containing rock outcrops, talus, and small mammal burrows within or adjacent to PCE 1 and PCE 2. The PCEs for the Alameda whipsnake are based on the current knowledge of the life history, biology, and ecology of the species and the requirements of the habitat necessary to sustain the essential life history functions of the subspecies. These three elements are further described as follows.

PCE 1: Scrub/shrub communities with a mosaic of open and closed canopy

This element is defined by scrub/shrub vegetation dominated by low to medium-stature woody shrubs with a mosaic of open and closed canopy as characterized by the chamise, chamise-eastwood manzanita, chaparral whitethorn, and interior live oak shrub vegetation series as identified in Sawyer and Keeler-Wolf (1995) and Mayer and Laudenslayer, Jr. (1988), occurring at elevations from sea level to approximately 3,850 feet. Such scrub/shrub vegetation within these series form a pattern of open and closed canopy which is used by the Alameda whipsnake to provide shelter from predators, temperature regulation by providing sunny and shady locations, prey-viewing opportunities, and nesting habitat and substrate. These features contribute to support a prey base consisting of western fence lizards and other prey species such as skinks, frogs, snakes, and birds.

PCE 2: Woodland or annual grassland plant communities contiguous to lands containing PCE 1

The vegetation series of this element are comprised of one or more of the following: blue oak, coast live oak, California bay, California buckeye, and California annual grassland vegetation series as identified in Sawyer and Keeler-Wolf (1995) and Mayer and Laudenslayer, Jr. (1988). This mosaic of vegetation supports a prey base consisting of western fence lizards and other prey species such as skinks, frogs, snakes, and birds and provides opportunities for: (1) foraging by allowing Alameda whipsnakes to come in contact with and visualize, track, and capture prey (especially western fence lizards along with other prey such as skinks, frogs, birds); (2) short and long distance dispersal within, between, or adjacent to areas containing essential features (i.e., PCE 1 or 3); and (3) contact with other Alameda whipsnakes for mating and reproduction.

PCE 3: Lands containing rock outcrops, talus, and small mammal burrows within or adjacent to PCE 1 and PCE 2

The areas within this element are used for retreats (shelter), hibernacula, foraging, dispersal, and provide additional prey population support functions.

Pallid Manzanita

The November 2002 *Draft Recovery Plan for Chaparral and Scrub Community Species East of San Francisco Bay, California* includes the pallid manzanita, Alameda whipsnake, and four species of concern (http://ecos.fws.gov/docs/recovery_plan/030407.pdf, Service 2002b). The draft recovery plan is currently being revised by the Service. For the current Status of the Species, refer to the *Arctostaphylos pallida (Pallid Manzanita) 5-Year Review: Summary and Evaluation* (http://ecos.fws.gov/docs/five_year_review/doc4105.pdf, Service 2010b). The November 2010 five-year review for the pallid manzanita recommended the uplisting of the status of the species to endangered due to the limited distribution of the pallid manzanita, severe plant health declines and death due to fungal diseases (e.g., *P. cinnamomi*), the loss of several colonies and decline of many others due to shading by native and non-native species and goat grazing, threats associated with wildfire fuel management, an overall lack of regeneration for more than 30 years, and the potential loss of its seed bank from too frequent a fire return interval caused by increased human ignition sources.

Currently, pallid manzanita occurs in several locations in the East Bay Hills in Contra Costa and Alameda Counties, California. The only large populations of pallid manzanita still known to exist are found at Huckleberry Ridge in Alameda and Contra Costa Counties and in Sobrante Ridge Regional Preserve in Contra Costa County. Other small, natural and planted populations occur on public and private land in Alameda and Contra Costa Counties. Habitat destruction and fragmentation from urbanization, introduction and spread of the fungal pathogen *P. cinnamomi*, fire suppression, herbicide spraying, competition with non-native plants, and hybridization with planted ornamental species of *Arctostaphylos* are the primary threats to pallid manzanita (Service 2010b).

Due to an overestimation in the number of plants at the two largest colonies and the loss and decline of several smaller colonies, the known number of pallid manzanita plants has decreased from as many as 4,986 at the time of listing in 1998 and the issuance of the draft recovery plan in 2002, to approximately 1,350 mature plants today. Three colonies have been extirpated (21 plants) and many other colonies have experienced declines (approximately 154 plants, excluding the two largest colonies), primarily due to shading from native and non-native plants and fungal pathogens. *P. cinnamomi* has been found to be infecting plants within the largest stand of pallid manzanita in Huckleberry Preserve (Service 2010b).

In 2006, sampling for the fungal pathogen *P. cinnamomi* was conducted by Phytosphere Research in Huckleberry Preserve in coordination with CDFW. Results indicated that *P. cinnamomi* is present in the soil, and as the affected area was on a steep slope near the top of the ridge, it is likely that the pathogen is also present downslope from the isolation site. The Sobrante Ridge population is not known to be afflicted with a root fungus and is the only colony of pallid manzanita that does not require immediate management attention to stimulate regeneration and remove native and non-native invasive plants (Service 2010b).

Environmental Baseline

Habitats within the Action Area

The vegetation communities that occur within the action area are described below. Table 3 below summarizes the acres of each vegetation community that occurs within the action area under the existing conditions and the future conditions after implementation of the proposed project.

California Annual Grasslands

California annual grasslands are scattered throughout the project area; large patches were identified in the Lake Chabot area. This community amounts to 127 acres in the action area. Dominant non-native invasive grasses include wild oats, ripgut brome, hare barley, and annual fescues. Common non-native forbs observed include burclover, rose clover, and filarees. Non-native invasive forbs, such as fennel and Italian thistle are present in California annual grassland communities where soils have been disturbed. Scattered native grasses, including purple needlegrass, blue wild rye, and creeping wild rye, occur sparingly in this community in the project area. Native forbs present include California poppy, yarrow, clovers, and blue-eyed

Table 3. Vegetation Communities within the Action Area

Vegetation Community Type	Existing Vegetation (acres)	Future with Project[1] (acres)
Broom Scrub	7.66	0.00
California Annual Grassland	126.88	129.52
Coastal Scrub (mesic)	30.77	0.00
Coastal Scrub (xeric)	338.93	170.18
Coniferous Forest/Plantation	47.15	4.22
Coyote Brush Scrub	217.73	100.73
Developed/Disturbed/Landscaped	138.21	139.66
Eucalyptus Forest/Plantation	1,546.9	669.37
Freshwater Marsh	0.97	0.97
Non-Native Coniferous Forest	112.39	38.55
Northern Maritime Chaparral	4.31	1.37
Oak-Bay Woodland/Forest	440.63	547.93
Redwood Forest	28.20	28.20
Riparian Woodland	19.98	42.31
Serpentine Bunchgrass Prairie	0.08	0.08
Successional Grassland	91.84	1,279.3
TOTAL	**3,152.63**	**3,152.39**

[1] "Future with Project" acres are based on the estimates provided by the applicants of the acres of each habitat within the project area in the 10-year goal.

grass. Scattered native shrubs, primarily coyote brush, were also commonly observed in California annual grasslands; however, cover of shrubs is generally less than five percent in this community type. California annual grasslands within the action area provide suitable dispersal, upland refugia, and aestivation habitat for California red-legged frogs and suitable dispersal and foraging habitat for Alameda whipsnakes.

Coastal Scrub

Northern coastal scrub communities are characterized by relatively open to dense woody shrub cover and an absence of trees. Saplings of oak species, California bay, and Monterey pine trees are sometimes emerging from the shrub canopy cover, as found in the Oakland North Hills-Skyline project area. The action area consists of 370 acres of northern coastal scrub. Northern coastal scrub communities in the project area include 339 acres of xeric scrub (*i.e.*, dry) and 31 acres of mesic scrub (*i.e.*, moist). The project area is dominated by shrubs and forbs adapted to relatively xeric conditions. Coyote brush is the dominant shrub in xeric coastal scrub communities in the project area. Other shrub species present include California sagebrush, toyon, silver bush lupine, poison oak, black sage, and sticky monkey-flower. Scattered coast live oak, California bay, and Monterey pine trees also occur in this community. Non-native invasive species commonly observed in coastal scrub include French broom and fennel. French broom is prevalent in the northern coastal scrub communities of Anthony Chabot Regional Park and near Skyline High School.

Coastal scrub communities dominated by species adapted to more mesic (*i.e.*, moist) conditions are also present in the project area, although less common than xeric coastal scrub communities. The dominant plant species observed in mesic coastal scrub include California blackberry, thimbleberry, blue elderberry, and California hazelnut. Non-native invasive species in this community include poison hemlock, Italian thistle, and Himalayan blackberry. Scattered coast live oak and California bay, as well as madrone and bigleaf maple are also occasionally present in this community. This community is present in the project area along the Grizzly Peak Trail south in Tilden Regional Park and adjacent to the North Oakland Sports Center.

Coastal scrub communities within the action area provide suitable dispersal habitat for California red-legged frogs and core scrub habitat for Alameda whipsnakes. Maritime chaparral communities within the action area at Sobrante Ridge, Huckleberry Botanic Regional Preserve Redwood Regional Park, Tilden Regional Park, and Sibley Volcanic Regional Preserve support pallid manzanitas.

Coniferous Forest/Non-native Coniferous Forest

The coniferous forest community in the project area is dominated by Monterey pine, which is native only to San Mateo, Monterey, and San Luis Obispo counties and was planted in the East Bay Hills in the early 1900s. Similar to other woodland and forest communities, the understory is typically sparse, and the ground is covered mostly by pine needles. In more open canopied Monterey pine forests, native shrubs species such as California blackberry, coyote brush, and poison oak are common. Non-native species commonly observed in Monterey pine forests include erect veldt grass, fennel, and poison hemlock.

The coniferous forest community covers 159 acres of the action area including 47 acres of native and 112 acres of non-native coniferous forest areas. Mature groves of varying densities of Monterey pine occur throughout the project area, often with eucalyptus, coast live oak, and California bay trees. Near the Tilden Golf Course in Tilden Regional Park, Douglas-fir is a co-dominant species with Monterey pine, and near Skyline High School (near Redwood Regional Park), the forest community is a mix of Monterey pine and coast redwood. In parts of the project area such as in North Hills-Skyline, Sibley Volcanic Regional Preserve, and Tilden Regional Park, Monterey pines are present and appear to be colonizing areas of coastal scrub as Monterey pine plantations. It is in these areas that they are singled out as stands of non-native coniferous forest. Coniferous forest communities within the action area provide suitable dispersal habitat for California red-legged frogs. Alameda whipsnakes are unlikely to forage or disperse through coniferous forest communities within the action area.

Coyote Brush Scrub

Coyote brush scrub is a successional stage from grassland to scrub and commonly occurs where grazing or fire has been discontinued or suppressed. Coyote brush scrub is distinct from northern coastal scrub by the density of coyote brush and low cover of other shrubs species, such as California sagebrush and poison oak. In areas of dense coyote brush, little or no understory is present; however, herbaceous grass and forb species such as wild oats, blue wild rye, and bracken fern are along edges or in open areas. Non-native invasive species such as Italian thistle and French broom are also commonly present in disturbed areas in this community. Scattered trees, such as eucalyptus, California bay, and Monterey pine, were identified in coyote brush scrub communities. In the project area, this community ranges from relatively open stands of coyote brush in Anthony Chabot Regional Park to areas of almost pure stands of coyote brush along Grizzly Peak Blvd. Large stands of coyote brush scrub were identified near Tilden Regional Park south side of Grizzly Peak Road, Sibley Regional Park, Redwood Regional Park, Anthony Chabot Regional Park, and in the northwest corner of North Hills-Skyline. This community covers 218 acres in the action area. Coyote brush scrub within the action area provides suitable dispersal habitat for California red-legged frogs and suitable core scrub and foraging and dispersal habitat for Alameda whipsnakes.

Developed/Disturbed/Landscaped

Developed, disturbed, and landscaped areas consist of land developed for residential and urban use, including landscaped and maintained residential and parkland, as well as areas used for road and trail construction and maintenance. Vegetation in these areas is predominantly planted trees, shrubs, and non-native herbaceous species. A large variety of ornamental trees and shrubs were observed in this community.

The action area includes 138 acres of developed, disturbed, and landscaped areas, primarily of private residences; large buildings, structures, and parking lots, such as the Chabot Space and Science Center parking lot, the UCB Mathematical Sciences Research Institute Building, and public roads. Landscaped areas include maintained yards associated with private residences and planted or maintained areas associated with public or regional park buildings, such as the mowed grassland in the Chabot Riding Stable area of Anthony Chabot Regional Park. In addition,

maintained (*i.e.*, mowed) and/or landscaped recreational areas are present such as the mowed grass playing fields of the North Oakland Sports Complex.

Disturbed vegetation includes areas created by natural or human disturbance that may support early succession stages of adjacent habitats. Disturbed areas are often susceptible to invasion by non-native species, including weeds such as French broom, fennel, poison hemlock, and Italian thistle. Disturbed areas were identified in a variety of locations, including areas near new development, along road shoulders, or on hillsides, such as the hillsides along portions of Grizzly Peak Blvd.

Developed, disturbed, and landscaped areas do not provide suitable habitat for California red-legged frogs or Alameda whipsnakes, but these listed species may occasionally disperse through these areas to access more suitable habitat.

Eucalyptus Forest

Eucalyptus trees were introduced from Australia and were widely planted throughout the East Bay Hills in the early 1900s. Eucalyptus trees are capable of rapid growth and prolific reproduction. A rapid growth rate and the production of allelopathic oils, which inhibit establishment of other species, have helped eucalyptus forests invade large areas of the East Bay Hills. The action area consists of 1,547 acres of eucalyptus forest, the largest vegetation community onsite.

Eucalyptus stands in the project area range between young stands (*i.e.*, less than 40 years old) of recently colonized saplings to mature stands (*i.e.*, over 40 years old) including some stands that have never been logged. Blue-gum eucalyptus is the dominant species; however, red gum eucalyptus also occurs. Young stands of eucalyptus occur in Sibley Regional Park, in the Oakland Caldecott Tunnel project area, and near the UCB campus (*i.e.*, at Strawberry and Claremont Canyons) and consist of second-growth trees sprouting from the cut stumps of the originally planted trees. The understory of these young stands usually supports a more diverse mix of native and non-native shrubs and herbaceous plants when compared to those in the mature stands. Native species in this community include California blackberry, poison oak, toyon, and coyote brush; non-native invasive species include cotoneaster, French broom, Scotch broom, erect veldtgrass, and occasionally the non-native oblong spurge.

Mature eucalyptus forests characterized by a closed-canopy and sparse shrub and forb understory are present in Tilden Regional Park and Anthony Chabot Regional Park. The dense canopy and abundant litter results in an understory relatively devoid of vegetation; however, scattered individuals of poison oak, California blackberry, and non-native invasive English ivy were observed in these mature stands. Scattered coast live oak and California bay trees are present in both young and mature eucalyptus stands. Additionally, redwood trees are occasionally present in stands of eucalyptus such as along the Grizzly Peak Trail in Tilden Regional Park. Eucalyptus forests within the action area provide low quality dispersal habitat for California red-legged frogs. Eucalyptus trees within the action area degrade the aquatic habitat for California red-legged frogs by altering hydrology and water chemistry. The high rates of transpiration by eucalyptus trees reduce the availability of surface water within the action area. The allelopathic

oils released from the litter of eucalyptus trees impair water quality within the action area and reduce the availability of suitable invertebrate prey species for the California red-legged frog. Alameda whipsnakes are unlikely to disperse or forage in eucalyptus forests within the action area. Eucalyptus forests within the action area threaten to displace suitable grassland, oak woodland, and core scrub habitat for the Alameda whipsnake.

Northern Maritime Chaparral

Northern maritime chaparral, also referred to as brittle-leaf-woolly leaf manzanita chaparral (Sawyer *et al.* 2008) is identified by the California Natural Diversity Database (CNDDB) as a sensitive plant community based on its rarity rank by CDFW (CDFW 2012). Maritime chaparral is typically found on soils with extremely low water-holding capacity and is dominated by native shrubs species. Common shrubs identified in the project area include brittle-leaf manzanita, chinquapin, evergreen huckleberry, and sticky monkey-flower. Pallid manzanita is found in this community and was observed in Sobrante Ridge and Huckleberry Botanical Regional Preserves.

Northern maritime chaparral only amounts to 4.3 acres in the action area. Restricted to relatively dry areas, this community was observed only in Sobrante Ridge and Huckleberry Botanical Regional Preserves. Northern maritime chaparral in both locations is dominated by brittle-leaf and pallid manzanita. The understory of this community includes scattered wood fern and interior live oak saplings. However, evergreen huckleberry and chinquapin are present in the Huckleberry Botanic Regional Preserve. Scattered trees including interior live oak and coast live oak are also present in this community. Northern maritime chaparral within the action area provides suitable dispersal habitat for the California red-legged frog, core scrub habitat for the Alameda whipsnake, and habitat for the pallid manzanita.

Oak-Bay Woodland

The oak-bay woodland community consists of a mix of predominantly coast live oak and California bay trees. Other native trees found in this vegetation community in the project area include California buckeye, bigleaf maple, and madrone. Monterey pine and eucalyptus were also observed in oak-bay woodlands, such as along the Grizzly Peak Trail and the Tilden Golf Course in Tilden Regional Park and in Sibley Regional Park. Oak-bay woodlands total 441 acres in the action area and represent the second largest vegetation community identified in the project area.

In areas where a closed tree canopy exists, such as along Redwood Road in Redwood Regional Park, the understory is sparse and consists of species such as poison oak, woodfern, and swordfern. In oak-bay woodlands with a more open canopy, such as along Seaview Drive and in Anthony Chabot Regional Park, a greater diversity of shrubs and herbaceous plants are present in the understory. Native species observed in these more open oak-bay woodlands include California blackberry, coyote brush, California hazelnut, toyon, and currants. Herbaceous plants may include hound's-tongue, alumroot, starflower, and slim Solomon's seal. Non-native species found in oak-bay woodlands include forget-me-not, and non-native invasive species include Himalayan blackberry and fennel. Oak-bay woodland within the action area provides suitable

dispersal habitat for California red-legged frogs and suitable dispersal and foraging habitat for Alameda whipsnakes.

Redwood Forest

Coast redwood trees tend to be on shallow soils on north and east-facing slopes or in valley or canyon bottoms. In the project area, natural redwood forest exists in Redwood Regional Park and in small patches in Anthony Chabot Regional Park. Coast redwood has also been planted in Claremont and Tilden Regional Parks. The redwood forest community comprises 28 acres of the action area. Observed redwood forests typically consist of a closed canopy of coast redwood trees with few if any other tree species. However, California bay and Monterey pine are co-dominant trees in patches of redwood forest along Seaview Drive and near Piedmont Stables in Redwood Regional Park. Shrubs and herbaceous species are relatively sparse in the understory of closed canopy redwood forests. Wild ginger, western trillium, and violets are abundant herbs in the understory of some groves. Evergreen huckleberry, poison oak, ocean spray, California hazelnut, and California huckleberry are sparsely distributed in the project area. Redwood forests within the action area provide suitable dispersal habitat for California red-legged frogs. Alameda whipsnakes are unlikely to disperse or forage in redwood forests.

Riparian Woodland

Riparian woodland communities are located along streams and on the edges of seeps and ponds. Arroyo willow is the dominant species in this community in the project area. Scattered California bay and coast live oak trees were also identified adjacent to riparian woodland communities. California blackberry, thimbleberry, sword fern, blue gum eucalyptus, and poison oak are commonly found in the understory. The most common non-native species identified in the action area's riparian woodland communities are English ivy and poison hemlock. This vegetation community is sparse in the project area (a total of 20 acres were identified); the largest patch was identified along Redwood Creek in Redwood Regional Park. Riparian woodlands within the action area provide suitable dispersal, foraging, and non-breeding aquatic habitat for the California red-legged frogs. Ponded areas within riparian woodlands within the action area with suitable depths and hydroperiods may provide suitable breeding habitat for California red-legged frogs. Alameda whipsnakes may utilize riparian areas within the action area as dispersal corridors.

Successional Grassland

The successional grassland community is characterized by grassland areas that appear to be in the process of transitioning into shrub-dominated communities. Vegetation consists primarily of non-native annual grasses and forb species found in California annual grasslands but with a higher cover of shrub species, typically coyote brush, than typically occurs in California annual grassland communities. In some areas, fire suppression and cessation of livestock grazing in the East Bay Hills have resulted in the succession of California annual grasslands into coyote brush scrub and coastal scrub communities (Stromberg *et al.* 2007). Vegetation management practices, including clearing eucalyptus stands, have also produced areas of successional grassland as shrubs have recolonized the area.

The action area consists of 92 acres of successional grassland community. Although coyote brush is the dominant shrub, other species such as sticky monkey-flower, poison oak, and occasional immature coast live oak, California bay, and other saplings were also observed. A majority of the successional grassland community present in the project area is found in Anthony Chabot Regional Park and along the west side of Grizzly Peak Road on the opposite side of Tilden Regional Park. Successional grassland within the action area provides suitable dispersal, upland refugia, and aestivation habitat for California red-legged frogs and suitable dispersal and foraging habitat for Alameda whipsnakes.

Riverine and Lacustrine Features

Riverine features in the action area and vicinity include several unnamed intermittent drainages. There are five perennial creeks in the project area: Wildcat, Strawberry, Claremont, San Leandro, and Redwood Creeks. The source of Wildcat Creek is in the southernmost section of the Tilden Regional Park project area. From its source, the creek runs northwest for more than 10 miles, parallels portions of the project area in Tilden and Wildcat Canyon Regional Parks, and eventually drains into San Pablo Bay. Strawberry and Claremont Creeks originate in the action area in Strawberry Canyon and Claremont Canyon Regional Preserve, respectively. These creeks run westward from the project area and become channelized and are diverted in culverts underground through the cities of Berkeley and Oakland before draining into San Francisco Bay. The source of San Leandro Creek is adjacent to the action area in Sibley Volcanic Regional Preserve. From its source, San Leandro Creek flows southeast to the Upper San Leandro Reservoir, runs through Anthony Chabot Regional Park before it becomes Lake Chabot, and finally drains into Arrowhead Marsh at San Leandro Bay. Redwood Creek begins in the action area in Redwood Regional Park and is a tributary to San Leandro Creek at the Upper San Leandro Reservoir.

Wildcat Creek is located in Wildcat Canyon Regional Park and Tilden Regional Park. Wildcat Creek flows northwest through the valley between the Berkeley Hills and San Pablo Ridge and passes through the City of San Pablo where it enters San Pablo Bay. A concrete lined culvert beneath a K-Mart parking lot and a California Department of Transportation maintained drop structure at Interstate 80 restrict steelhead access to the lower creek, but these barriers may be passable during some flows. Two EBRPD-managed dams in the creek's upper watershed form Jewel Lake and Lake Anza and block all upstream steelhead migration.

San Leandro Creek is downstream of Lake Chabot in Anthony Chabot Regional Park. The construction of the Chabot Reservoir created barriers to steelhead migration in this creek that have existed since 1874 and include the Upper San Leandro Reservoir and four-foot concrete weir, located 0.3 mile upstream from Interstate 80.

Other than Lake Chabot, there are limited lacustrine features in the action area and vicinity. Two small reservoirs along Wildcat Creek in Tilden Regional Park (Lake Anza and Jewel Lake) are the only pond-like features in the project vicinity. Lake Anza is the larger reservoir and is open for swimming. Four larger reservoirs are within a five-mile radius of the action area: Briones Reservoir, San Pablo Reservoir, and the Upper San Leandro Reservoir. Lake Chabot is the only major reservoir close to the action area.

Rivers, streams, ponds, and lacustrine features within the action area provide suitable dispersal and non-breeding aquatic habitat for California red-legged frogs. A few of these areas within the action area that have suitable depths and hydroperiods may provide suitable breeding habitat for California red-legged frogs.

Wetlands

The 2010 National Wetland Inventory data indicate that there are some potential small wetland features along Wildcat Creek in the action area (Service 2010c). Vegetation and hydrology observed during vegetation mapping further suggest that other small wetlands may occur in the action area. These wetlands are mapped as riparian woodland and are associated with the five perennial creeks in the project area: Wildcat, Strawberry, Claremont, San Leandro, and Redwood Creeks, as well as other unnamed drainages, seeps, and ponds.

California Red-Legged Frog

The action area is located within the recovery plan's South and East San Francisco Bay Recovery Unit for the California red-legged frog (Service 2002a). The recovery status for this recovery unit is considered high due to many existing populations and many areas with high habitat suitability (Service 2002a). Threats to California red-legged frogs within this recovery unit include cattle grazing and/or dairies; non-native species; urbanization; and water management, diversions, and reservoirs. The action area is not located within a core area for the California red-legged frog. The nearest core area is the East San Francisco Bay Core Area which occurs within 0.25 mile of EBRPD's project areas at Lake Chabot Regional Park (Service 2002a). The core area is important for the recovery of the California red-legged frog due to it currently be occupied, being a source population, and for connectivity to other populations of California red-legged frogs. The conservation needs identified within the recovery plan for the East San Francisco Bay Core Area include: protecting existing populations; controlling non-native predators; studying effects of grazing in riparian corridors, ponds and uplands (*e.g.*, on EBRPD lands); reducing impacts associated with livestock grazing; protecting habitat connectivity; minimizing effects of recreation and off-road vehicle use (*e.g.*, Corral Hollow watershed); avoiding and reducing impacts of urbanization; and protecting habitat buffers from nearby urbanization (Service 2002a).

The action area does not overlap any designated critical habitat units; however, unit CCS-1 (Berkeley Hills) is less than two miles east of the Sobrante Ridge Regional Preserve portion of the action area (Service 2010a). Critical habitat unit units ALA-1A (Dublin Canyon) and ALA-1B (Cook Canyon) are about four miles southeast of the Anthony Chabot Regional Park portions of the action area (Service 2010a).

Based on the CNDDB (CDFW 2012), there are no known occurrences of the California red-legged frog within the action area. There are 22 reported CNDDB occurrences within five miles of the action area. Of these occurrences, four are located within two miles, a distance that the species has been documented dispersing to locate breeding habitat (Service 2002a). All of these occurrences are presumed to be extant (currently present), and most were recorded within the last 10 years. It is likely that there are additional occurrences that have not been documented. The

EBRPD has conducted surveys for California red-legged frogs in aquatic habitats in its parks and report occurrences of the species in Sobrante Ridge Regional Preserve (Bobzien and DiDonato 2007). EBRPD surveys are included in the CNDDB.

The following four CNDDB occurrences of the California red-legged frog are within two miles of the action area (CDFW 2012):

1. Sibley Volcanic Regional Preserve, RTA SR002B: one CNDDB occurrence along a stream approximately 250 feet from the action area;

2. Kennedy Grove, RTA KG002: one CNDDB occurrence along a stream approximately 650 feet from the action area;

3. Sobrante Ridge Regional Preserve: one CNDDB occurrence along a stream approximately 4,400 feet from the action area; and

4. Tilden Regional Park: one CNDDB occurrence at a pond approximately 6,000 feet away from the action area.

California red-legged frogs are known to occur near the action area and have the potential to occur in suitable habitat within the action area. As described above, there are four CNDDB occurrences within the distance that the species has been documented dispersing, and portions of the action area contain suitable upland, dispersal, and non-breeding aquatic habitat (Table 4).

California red-legged frog habitat in the action area includes both aquatic/riparian habitat and upland dispersal habitat. Since there are no known breeding occurrences within the action area or ponds suitable for California red-legged frog breeding, aquatic/riparian habitat within the action area is considered non-breeding habitat. To identify non-breeding aquatic/riparian habitat, the existing vegetation base layer intersected with the U.S. Geological Survey National Hydrography Dataset (NHD) line surface hydrology shapefile was used to identify stream channels in the action area (http://nhd.usgs.gov/). The NHD is a comprehensive set of digital spatial data that contains information about naturally occurring and constructed bodies of water, natural and artificial paths of water flows, and related hydrographic entities. Both ephemeral and perennial streams are included as surface water hydrology. A 50-foot buffer along the NHD line was established to identify the spatial extent of potential California red-legged frog non-breeding aquatic/riparian areas in the action area. There are about 72.8 acres of potential non-breeding riparian/aquatic habitat (non-developed areas within 50 feet of NHD line surface hydrology) within the action area for the proposed and interconnected projects including about 20 acres of identified riparian woodland (Table 3).

To determine suitable upland dispersal habitat, a 500-foot buffer along the NHD line was established, since California red-legged frogs are unlikely to be in areas more than 500 feet from aquatic habitat unless they are dispersing between breeding areas on rainy days. Since major ground disturbing work and use of heavy equipment would not occur during the wet season or on rainy days (unless exclusion fencing is installed prior to the start of the wet season), the 500-foot

Table 4. California Red-legged Frog Suitable Habitat in the Action Area.

Park	Action Type	Acres of Suitable Habitat[1]	Acres of Unsuitable Habitat[2]
Claremont Canyon	Proposed	31.26	0.29
	Interconnected	0.00	0.00
Frowning Ridge	Proposed	77.86	0.61
	Interconnected	0.00	0.00
Tilden-Grizzly Peak Blvd.	Proposed	0.12	0.01
	Interconnected	0.00	0.00
Sobrante	Proposed	0.96	0.00
	Interconnected	11.54	0.39
Tilden Park	Proposed	15.04	1.90
	Interconnected	131.50	17.34
Wildcat Canyon	Proposed	0.00	0.00
	Interconnected	37.43	5.35
Kennedy Grove	Proposed	0.00	0.00
	Interconnected	13.04	2.63
Anthony Chabot	Proposed	77.64	2.20
	Interconnected	169.56	0.00
Claremont Canyon-EBRPD	Proposed	11.45	0.80
	Interconnected	23.99	0.03
Huckleberry	Proposed	17.75	0.24
	Interconnected	0.32	0.00
Lake Chabot	Proposed	0.00	0.00
	Interconnected	4.19	0.00
Leona Canyon	Proposed	0.00	0.00
	Interconnected	2.97	0.00
Redwood	Proposed	12.93	2.19
	Interconnected	30.81	1.89
Sibley Volcanic	Proposed	11.73	0.02
	Interconnected	15.49	0.00
TOTAL	**Proposed**	**256.7**	**8.3**
	Interconnected	**440.8**	**27.6**

[1] Areas of suitable habitat for the California red-legged frog considered in this table are any non-developed habitats within 500 feet of U.S. Geological Survey National Hydrography Dataset (NHD) line surface hydrology. If a park is not listed, then no suitable habitat was identified.

[2] Areas of unsuitable habitat for the California red-legged frog considered in this table are any areas more than 500 feet of NHD line surface hydrology and all developed areas.

buffer was considered appropriate for determining upland habitat areas where California red-legged frogs may be encountered during proposed project activities.

Of the 22 parks/parcels evaluated, 14 contain existing California red-legged frog suitable habitat. The parks/parcels with California red-legged frog suitable habitat are shown in Table 4 above. There are about 697.5 acres of suitable habitat for the California red-legged frog within 500 feet of NHD line surface hydrology including about 72.8 acres of potential non-breeding riparian/aquatic habitat (areas within 50 feet of NHD line surface hydrology).

Alameda Whipsnake

Draft Recovery Plan

The draft recovery plan for the Alameda whipsnake (Service 2002b) established draft recovery units (units 1 thru 5) to correspond to each of the five populations of Alameda whipsnake. In addition, two draft recovery units (units 6 and 7) were established to correspond to corridors that best provide habitat linkage between the five populations. The action area for the proposed project overlaps with draft recovery Unit 1 (Tilden-Briones), Unit 2 (Oakland-Las Trampas), and Unit 6 (Caldecott Tunnel Corridor) (Service 2002b).

Recovery Unit 1 (Tilden-Briones)

The Tilden-Briones Recovery Unit (Unit 1) has 60.4 percent of its land in open space or conservation status. These lands include EBRPD's Sobrante Ridge, Kennedy Grove, Wildcat Canyon, Tilden Regional Park, and Briones Regional Park; and East Bay Municipal Utility District's San Pablo Reservoir and Watershed, Briones Watershed, and Pinole Watershed. The recovery goal for this recovery unit is that a minimum of three Alameda whipsnake populations should have protection in perpetuity. Essential for connectivity with Recovery Unit 2 will be protection of the area between Tilden Regional Park and the Caldecott Tunnel Corridor (Recovery Unit 6) properties of East Bay Municipal Utility District (Siesta Valley) and UCB. Land management for this recovery unit should include specific management for Alameda whipsnake and its habitat, including but not limited to addressing eucalyptus and French broom encroachment into chaparral/scrub habitats, limiting feral cat populations, implementing appropriate grazing management, promoting connectivity over the Caldecott Tunnel Corridor to the Oakland-Las Trampas Recovery Unit, and coordinating with fire management jurisdictions/agencies (Service 2002b).

Recovery Unit 2 (Oakland-Las Trampas)

The Oakland-Las Trampas Recovery Unit (Unit 2) has developmental pressures around its entire perimeter. Within the recovery unit, 44.6 percent of the land is in open space or conservation status. These lands include EBRPD's Roberts Recreation Area, Redwood Regional Park, Leona Open Space, Anthony and Lake Chabot Regional Parks along the east side of the recovery unit, Las Trampas Regional Wilderness and Machado and Bishop Ranch Land Banks on the west side of the recovery unit, and Cull Canyon Regional Recreation Area at the southern end of the recovery unit; East Bay Municipal Utility District's Upper San Leandro Reservoir and Watershed (approximately in the middle of the recovery unit) and the somewhat isolated Lafayette Reservoir and Watershed; and lands owned by Oakland, including Joaquin Miller Park and Oakland Zoo on the west side of the recovery unit. The recovery goal for this recovery unit

is that a minimum of four populations of Alameda whipsnakes should be provided protection in perpetuity. Areas essential for connectivity should include the areas between known and yet to be identified populations. In the north, where the recovery unit narrows to the Caldecott Tunnel Corridor (Recovery Unit 6), either Redwood Regional Park or Gudde Ridge to the east might provide connectivity between the San Leandro Watershed population and Recovery Unit 6. Along the interface of this recovery unit with Hayward-Pleasanton Ridge (Recovery Unit 3), optimal areas for connectivity also need to be identified and preserved.

Land management for this recovery unit should include specific management for Alameda whipsnake and its habitat, including but not limited to addressing eucalyptus and French broom encroachment into chaparral/scrub habitats (particularly on the west side of the Oakland Hills), limiting feral cat populations, implementing appropriate grazing management, promoting connectivity over the Caldecott Tunnel Corridor to the Tilden-Briones Recovery Unit and with the Hayward-Pleasanton Ridge Recovery Unit, and coordinating with fire management jurisdictions/agencies. Fire management plans should be coordinated between the land management agencies and should maximize habitat enhancement for Alameda whipsnake.

Recovery Unit 6 (Caldecott Tunnel Corridor)

Some lands in this corridor are in open space, including lands owned by UCB; Lawrence Berkeley National Laboratory (within the University lands); California Department of Transportation; EBRPD's Claremont Canyon Regional Park, Sibley Volcanic Preserve, and Huckleberry Botanic Preserve; and East Bay Municipal Utility District's Siesta Valley Watershed and Gateway Watershed. However, private lands in the Caldecott Tunnel area provide essential connectivity between Recovery Units 1 and 2.

To ensure connectivity between Recovery Units 1 and 2, a significant portion of the above mentioned lands would need to be protected in perpetuity, and strategically situated private landowners would need to participate in management, restoration, and/or protection programs designed to benefit the Alameda whipsnake. Surveys, mapping and assessment will determine site-specific actions.

The cities of Berkeley and Oakland, as well as the landowners mentioned above, should have land management plans that address human activity impacts, including eucalyptus and French broom encroachment into chaparral/scrub habitats, increased predation, and fuels management. Continuing cooperation between landowners and State and Federal staff should occur in designing any vegetation management activities within this corridor.

Occurrences within the Action Area

There are 70 CNDDB occurrences of Alameda whipsnake in the action area and vicinity (CNDDB, CDFW 2012). The CNDDB classifies Alameda whipsnake occurrence data as sensitive so only a limited amount of information, including date and U.S. Geological Survey 7.5-minute quadrangle location, is available for these occurrences, and the exact location of occurrences is not provided. However, there are location-specific occurrences of the species

reported in the EBRPD WHRRMP Environmental Impact Report, including two occurrences in or immediately adjacent to the action area (LSA Associates, Inc. 2009).

The most recent occurrences (n=14) of Alameda whipsnake in the action area were recorded in 2004 in the Frowning Ridge parcel (CNDDB, CDFW 2012). Additional Alameda whipsnake occurrences were recorded by Karen Swaim in the Frowning Ridge parcel (n=1) and Tilden Regional Park (n=1) (LSA Associates, Inc. 2009).

Suitable Habitat within the Action Area

The Alameda whipsnake is known to occur in portions of the action area and has the potential to occur in other parts of the action area where suitable habitat with elements to support the species are present. For the effects analysis, suitable core scrub habitat for the Alameda whipsnake is defined as: (1) all coastal scrub (xeric), coyote brush scrub, and/or maritime chaparral habitat areas greater than 0.5 acre in size; and (2) coastal scrub (xeric), coyote brush scrub, and/or maritime chaparral habitat areas greater than 0.2 acre in size that are within 50 feet of coastal scrub (xeric), coyote brush scrub, and/or maritime chaparral habitat areas greater than 0.5 acre in size and adjacent to foraging/dispersal habitat. Suitable foraging/dispersal habitat for the Alameda whipsnake is defined as oak woodland, grassland, and riparian woodland habitats that are contiguous with core scrub habitat. The acres of suitable Alameda whipsnake habitat within the action area are summarized for each applicant by park in Table 5 below. Of the 22 parks/parcels evaluated, 15 contain existing suitable Alameda whipsnake habitat. Miller/Knox Shoreline and Point Pinole Regional Park are outside of the range of the Alameda whipsnake, and, therefore, are not included in Table 5. There are about 1,056.8 acres of suitable Alameda whipsnake habitat within the action area including about 535.4 acres of core scrub habitat and 521.4 acres of foraging/dispersal habitat. The remaining 1,753.4 acres within the action area are unsuitable for Alameda whipsnakes primarily because they are dominated by non-native trees like eucalyptus and Monterey pine, or they are developed. UCB proposed treatment areas contain a total of about 61.9 acres of core scrub habitat, 32.5 acres of foraging/dispersal habitat, and 189.9 acres of unsuitable habitat. Oakland proposed treatment areas contain a total of about 50.5 acres of core scrub habitat, 13.7 acres of foraging/dispersal habitat, and 57.8 acres of unsuitable habitat. EBRPD proposed and interconnected treatment areas contain a total of about 422.9 acres of core scrub habitat, 475.2 acres of foraging/dispersal habitat, and 1,505.7 acres of unsuitable habitat.

Table 5. Suitable Habitat for Alameda Whipsnake in the Action Area

Applicant	Park[1]	Core Scrub (acres)	Foraging/ Dispersal (acres)	Unsuitable (acres)
UCB	Strawberry Canyon	1.38	0.00	54.95
	Claremont Canyon	7.12	1.56	34.13
	Frowning Ridge-UCB	53.44	30.96	100.78
	UCB TOTAL	**61.94**	**32.52**	**189.86**
Oakland	Caldecott Tunnel-Oakland	4.26	12.79	36.57
	North Hills Skyline-Oakland	46.25	0.90	21.19
	Oakland TOTAL	**50.51**	**13.69**	**57.76**
EBRPD (Proposed and Interconnected)	Anthony Chabot	173.00	96.53	750.72
	Claremont Canyon	99.41	39.16	13.38
	Claremont Canyon-Stonewall	0.75	2.88	10.03
	Huckleberry	3.72	11.55	2.80
	Kennedy Grove	0.83	2.71	11.67
	Lake Chabot	4.43	29.75	67.32
	Leona Canyon	25.76	37.97	1.34
	Redwood	15.73	27.7	120.38
	Sibley-Triangle and Island	0.92	2.09	0.91
	Sibley Volcanic	17.81	59.23	84.99
	Sobrante Ridge	0.64	11.74	5.99
	Temescal	0.00	0.62	0.92
	Tilden-Grizzly Peak	6.55	7.22	20.51
	Tilden Regional Preserve	45.10	103.05	363.86
	Wildcat Canyon	28.29	42.96	50.91
	EBRPD TOTAL	**422.94**	**475.16**	**1505.73**
TOTAL	**TOTAL**	**535.39**	**521.37**	**1753.35**

[1] Miller/Knox Regional Shoreline and Point Pinole Regional Recreation Area are outside the range of the Alameda whipsnake and therefore not included.

Alameda Whipsnake Critical Habitat

Unit 1: Tilden-Briones

Alameda whipsnake designated critical habitat Unit 1 (Tilden-Briones) covers 34,119 acres in Alameda and Contra Costa counties, California. Unit 1 is bordered approximately by State Highway 4 and the cities of Pinole, Hercules, and Martinez to the north; by State Highway 24 and the City of Orinda Village to the south; Interstate 80 and the cities of Berkeley, El Cerrito, and Richmond, to the west; and Interstate 680 and the City of Pleasant Hill to the east. The south end of Unit 1 abuts Unit 6. Land ownership within the unit includes approximately 8,108 acres of EBRPD lands, 15 acres of State land, and the remaining 25,997 acres under private ownership. The unit contains a complex mosaic of grassland with woody scrub vegetation of several types (PCE 1 and PCE 2), as well as rock outcrops or other talus features (PCE 3)

distributed throughout the unit with little habitat fragmentation. Alameda whipsnake records occur within the unit and are uniformly distributed throughout the unit (Swaim 2005a). The dates of Alameda whipsnake records span a time period from before the subspecies' listing to after the time of listing (1986 to present). Habitat fragmentation is minimal. Very limited development has occurred within the unit, with the exception of a few structures presumably associated with livestock management. The distribution of essential features throughout the unit and low fragmentation allows Alameda whipsnakes to utilize and freely disperse within the unit, making the overall population less vulnerable to local extirpation which could result from fire, landslide, or some other natural event (*e.g.*, drought, disease) (Service 2006b).

The unit is designated critical habitat because it contains features essential to the conservation of the Alameda whipsnake, is currently occupied, and represents the northwestern portion of the subspecies' range and one of five population centers. The special management actions that may be required within the unit include prescribed burns and management of grazing activities. Additional special management actions that may be required for this unit include management of trespass, unauthorized trail construction, dumping, and/or feral animals, and other activities or situations associated with the urban or recreational interface (Service 2006b).

Unit 2: Oakland-Las Trampas

Alameda whipsnake designated critical habitat Unit 2 (Oakland-Las Trampas) covers 24,436 acres in Alameda and Contra Costa counties, California. Unit 2 is located south of State Route 24, north of Interstate 580, east of State Route 13, and west of Interstate 680 and the cities of Danville, San Ramon, and Dublin. The north edge of Unit 2 abuts Unit 6. Land ownership includes 4,386 acres of EBRPD and East Bay Municipal Utilities District lands and 20,050 acres under private ownership (Service 2006b).

Unit 2 contains a range of vegetation (PCE 1 and PCE 2), soil types, and rocky features (PCE 3) essential to the conservation of the subspecies, supports viable Alameda whipsnake populations, and has minimal development such as roads and structures (Swaim 2005). Areas with development or reduced soil and vegetation characteristics have not been included in the critical habitat for this unit. Unit 2 essential features that contain more dense woodland habitat may be subject to special management considerations, such as prescribed burns, to improve the habitat quality and enhance the potential for Alameda whipsnake movement between units. Additional special management actions that may be required throughout this unit include management of trespass, unauthorized trail construction, dumping, and/or feral animals, and other activities or situations associated with the urban or recreational interface (Service 2006b).

Alameda whipsnake occurrences have been documented by multiple records within the unit as well as adjacent to the unit (Swaim 2005). Dispersal of Alameda whipsnakes between Units 2 and 1 is possible only through Unit 6, and impediments to such movement do not appear to be present. Unit 2 is included in the critical habitat because it contains features essential to the conservation of the Alameda whipsnake, is currently occupied by the subspecies, and represents the central distribution of Alameda whipsnake and one of the five population centers (Service 2006b).

Unit 6: Caldecott Tunnel

Alameda whipsnake designated critical habitat Unit 6 (Caldecott Tunnel) covers 4,151 acres in Alameda and Contra Costa counties, California. This critical habitat unit lies between Units 1 and 2, along the Alameda and Contra Costa county lines. Land ownership within this unit includes 265 acres of EBRPD lands, 720 acres of State, and 3,166 acres in private lands. The unit is bounded by dense urban development to the east and west. However, the vegetation and soil types that are known to support Alameda whipsnake are dominant throughout the unit (PCEs 1, 2, 3). About eight Alameda whipsnake records are known from the unit between 1990 and 2002 (Swaim 2005). Special management considerations in this unit include possible consolidation of existing roads, or limiting additional road construction in order to preserve a corridor function in this unit as a consequence of the restricted width of the unit and the current presence of a moderate number of roads. Prescribed burns may also be required to maintain the habitat. The unit is included in designated critical habitat because it contains features essential to the conservation of the Alameda whipsnake, is currently occupied, and represents the last remaining habitat connecting Unit 1 and Unit 2, which are two of the five population centers for the subspecies. Maintaining connectivity between units allows for dispersal between units for the subspecies and allows for genetic exchange among all three units (Service 2006b).

Critical Habitat within the Action Area

Of the 22 parks/parcels within the action area, 15 contain Alameda whipsnake designated critical habitat. The acres of designated critical habitat and PCEs within the action area are summarized in Table 6 below for each applicant by park and critical habitat unit. A total of about 1,348.75 acres of designated critical habitat occurs within the action area: 611.72 acres within Unit 1, 106.25 acres within Unit 2, and 630.78 acres within Unit 6. Thus, the action area covers 2 percent of Unit 1, 0.4 percent of Unit 2, and 15 percent of Unit 6.

For the effects analysis, suitable core scrub habitat (PCE 1) for the Alameda whipsnake is defined as: (1) all coastal scrub (xeric), coyote brush scrub, and/or maritime chaparral habitat areas greater than 0.5 acre in size; and (2) coastal scrub (xeric), coyote brush scrub, and/or maritime chaparral habitat areas greater than 0.2 acre in size that are within 50 feet of coastal scrub (xeric), coyote brush scrub, and/or maritime chaparral habitat areas greater than 0.5 acre in size and adjacent to foraging/dispersal habitat. Suitable foraging/dispersal habitat (PCE 2) for the Alameda whipsnake is defined as oak woodland, grassland, and riparian woodland habitats that are contiguous with core scrub habitat.

UCB: Strawberry Canyon, Claremont Canyon, and Frowning Ridge

A total of about 10.31 acres of UCB's proposed treatment area at Strawberry Canyon occur within designated critical habitat Unit 1. Habitats within UCB's proposed treatment area within critical habitat Unit 1 at Strawberry Canyon consist of 1.02 acres of core scrub (PCE 1) and 9.29 acres of unsuitable habitat dominated by eucalyptus without any PCEs. There is no suitable foraging/dispersal habitat (PCE 2) within UCB's proposed treatment area within designated critical habitat Unit 1 (Table 6). There is no data on the availability of rock outcrops (PCE 3) within the action area.

Table 6. Alameda Whipsnake Designated Critical Habitat in the Action Area

Applicant	Park	Critical Habitat Unit	Total Acres within Critical Habitat	Existing Conditions (acres)		
				PCE 1	PCE 2	Acres without PCEs
UCB	Strawberry Canyon	1	10.31	1.02	0.00	9.29
		6	13.15	0.37	0.00	12.78
	Claremont Canyon	6	42.81	7.12	1.56	34.12
	Frowning Ridge	1	9.87	2.44	4.05	3.38
		6	174.36	50.74	26.75	96.87
Oakland	North Hills-Skyline	6	62.09	43.21	0.00	18.88
EBRPD	Anthony Chabot	2	16.16	8.19	6.58	1.39
	Claremont Canyon	6	145.06	96.25	37.11	11.7
	Claremont Canyon-Stonewall	6	11.85	0.75	2.88	8.22
	Huckleberry	2	1.62	0.00	1.16	0.46
		6	16.34	3.71	10.35	2.28
	Kennedy Grove	1	14.77	0.83	2.45	11.49
	Redwood	2	88.47	7.84	6.74	73.85
	Sibley Island	6	3.84	0.92	2.03	0.89
	Sibley Volcanic Regional Preserve	6	161.28	17.75	59.03	84.5
	Tilden Regional Preserve	1	447.11	42.28	81.19	323.64
	Tilden-Grizzly Peak Blvd.	1	34.15	6.42	7.22	20.51
	Wildcat Canyon	1	95.51	24.42	31.63	39.46
TOTAL	**TOTAL**	**1**	**77.41**	**126.54**	**407.77**	**77.41**
	TOTAL	**2**	**16.03**	**14.48**	**75.7**	**16.03**
	TOTAL	**6**	**220.82**	**139.71**	**270.24**	**220.82**

A total of about 13.51 acres of UCB's proposed treatment area at Strawberry Canyon occur within designated critical habitat Unit 6. Habitats within UCB's proposed treatment area within critical habitat Unit 6 at Strawberry Canyon consist of 0.37 acre of PCE 1 and 12.78 acres of unsuitable habitat dominated by eucalyptus and other non-native trees without any PCEs. There is no suitable PCE 2 within UCB's proposed treatment area at Strawberry Canyon within designated critical habitat Unit 6 (Table 6). There is no data on the availability of PCE 3 within the action area.

A total of about 42.81 acres of UCB's proposed treatment area at Claremont Canyon occur within designated critical habitat Unit 6. Habitats within UCB's proposed treatment area within critical habitat Unit 6 at Claremont Canyon consist of 7.12 acres of PCE 1, 1.56 acres of PCE 2, and 34.12 acres of unsuitable habitat dominated by eucalyptus and other non-native trees without any PCEs (Table 6). There is no data on the availability of PCE 3 within the action area.

A total of about 9.87 acres of UCB's proposed treatment area at Frowning Ridge occur within designated critical habitat Unit 1. Habitats within UCB's proposed treatment area within critical habitat Unit 1 at Frowning Ridge consist of 2.44 acres of PCE 1, 4.05 acres of PCE 2, and 3.38 acres of unsuitable habitat dominated by eucalyptus without any PCEs (Table 6). There is no data on the availability of rock outcrops (PCE 3) within the action area.

A total of about 174.36 acres of UCB's proposed treatment area at Frowning Ridge occur within designated critical habitat Unit 6. Habitats within UCB's proposed treatment area within critical habitat Unit 6 at Frowning Ridge consist of 50.74 acres of PCE 1, 26.75 acres of PCE 2, and 96.87 acres of unsuitable habitat dominated by eucalyptus and other non-native trees without any PCEs (Table 6). There is no data on the availability of PCE 3 within the action area.

Oakland: North Hills-Skyline

A total of about 62.09 acres of Oakland's proposed treatment area at North Hills-Skyline occur within designated critical habitat Unit 6. Habitats within Oakland's proposed treatment area within critical habitat Unit 6 at North Hills-Skyline consist of 43.21 acres of PCE 1 and 18.88 acres of unsuitable habitat dominated by eucalyptus, Monterey pine, and other non-native trees without any PCEs (Table 6). There is no suitable PCE 2 within Oakland's proposed treatment area at North Hills-Skyline within designated critical habitat Unit 6 (Table 6). There is no data on the availability of PCE 3 within the action area. About 90 large Monterey pines cover about 8.5 acres within the shrub matrix at North Hills-Skyline; these pines and other trees within the area threaten to take over the PCE 1 at North Hills-Skyline.

EBRPD: WHRRMP Treatment Areas

A total of about 591.54 acres of EBRPD's WHRRMP treatment areas occur within designated critical habitat Unit 1 at Kennedy Grove, Tilden Regional Preserve, Tilden-Grizzly Peak Blvd., and Wildcat Canyon regional parks. Habitats within EBRPD's treatment areas within critical habitat Unit 1 consist of 73.95 acres of PCE 1, 122.29 acres of PCE 2, and 395.10 acres of unsuitable habitat dominated by eucalyptus and other non-native trees without any PCEs (Table 6). There is no data on the availability of PCE 3 within the action area.

A total of about 106.25 acres of EBRPD's treatment areas occur within designated critical habitat Unit 2 at Anthony Chabot, Huckleberry, and Redwood regional parks. Habitats within EBRPD's proposed and interconnected treatment areas within critical habitat Unit 2 consist of 16.03 acres of PCE 1, 14.48 acres of PCE 2, and 75.70 acres of unsuitable habitat dominated by eucalyptus and other non-native trees without any PCEs (Table 6). There is no data on the availability of PCE 3 within the action area.

A total of about 338.37 acres of EBRPD's treatment areas occur within designated critical habitat Unit 6 at Claremont Canyon, Claremont Canyon-Stonewall, Sibley Island, and Sibley Volcanic Regional Preserve. Habitats within EBRPD's proposed and interconnected treatment areas within critical habitat Unit 6 consist of 119.38 acres of PCE 1, 111.40 acres of PCE 2, and 107.59 acres of unsuitable habitat dominated by eucalyptus and other non-native trees without any PCEs (Table 6). There is no data on the availability of PCE 3 within the action area.

Pallid Manzanita

Several documented and observed CNDDB occurrences of pallid manzanita occur in the action area within EBRPD's WHRRMP treatment areas (CDFW 2012, ESA 2013). The two largest known populations of the species occur in Sobrante Ridge Regional Preserve and Huckleberry Botanic Regional Preserve, including portions of the action area. A census of pallid manzanita occurring on EBRPD lands was conducted in 2004 by EBRPD biologists, during which each individual plant's location and canopy radius was mapped (Service 2010b). Huckleberry Preserve had 747 mature plants and 176 seedlings that occupied 20 acres, and Sobrante Ridge had 454 mature plants that occupied 9 acres. Together, the two largest colonies represent 89 percent of the total number of mature pallid manzanita plants in existence. Satellite colonies of the Huckleberry Preserve colony occur on other properties managed by EBRPD, including Sibley Volcanic Regional Preserve and Redwood Regional Park. In addition, a single naturalized population occurs near the Tilden Park Botanical Garden in Contra Costa County (Service 2010b). In addition, it is likely that viable seed banks exist within the action area, and the proposed treatment activities may stimulate germination. Therefore, this species is known to occur in parts of the action area and may occur in other areas with suitable habitat. There are no known occurrences of the pallid manzanita within UCB and Oakland's proposed treatment areas.

Additional information on known occurrences of pallid manzanita was obtained from an EBRPD wildfire hazard reduction stewardship resources site assessment, completed in February 2012 and the Draft EBRPD Pallid Manzanita Management Plan (ESA 2013). Of the 22 parks/parcels evaluated, 5 contain known occurrences of pallid manzanita, as shown in Table 7 below. There are 1.3 acres of occupied pallid manzanita habitat within the action area in EBRPD WHRRMP treatment areas. The largest population occurs at Huckleberry Preserve and is known to be infected with *P. cinnamomi*. There is an estimated total of 656 pallid manzanita plants within EBRPD's proposed WHRRMP treatment areas including: 74 plants in Redwood Regional Park RTA RD001, 478 in Huckleberry Botanic Regional Preserve RTA HP002, 11 in Huckleberry Botanic Regional Preserve RTA HP002, 3 in Sibley Regional Volcanic Park RTA SR005, 12 in Tilden Regional Park RTA TI011, 8 in Tilden Regional Park RTA TI021, and 70 in Sobrante Ridge Regional Preserve RTA SO001. An additional 389 pallid manzanita plants occur on

Table 7. Acres of Occupied Pallid Manzanita Habitat within EBRPD WHRRMP Treatment Areas.

Park	Action Type	Acres
Huckleberry	Proposed	0.99
	Interconnected	0.00
Redwood	Proposed	0.00
	Interconnected	0.01
Sobrante	Proposed	0.16
	Interconnected	0.00
Tilden Park	Proposed	0.00
	Interconnected	0.08
Sibley Volcanic	Proposed	0.003
	Interconnected	0.00
Total	**Proposed**	**1.20**
	Interconnected	**0.10**

EBRPD lands within the proposed Draft EBRPD Pallid Manzanita Management Plan area (ESA 2013). An additional 431 pallid manzanita plants occur on private lands adjacent to but outside of EBRPD's proposed WHRRMP treatment areas and Draft EBRPD Pallid Manzanita Management Plan area (ESA 2013). Summarized below are the occurrences of pallid manzanita within EBRPD WHRRMP treatment areas followed by a discussion of pallid manzanita plants that occur on EBRPD lands outside of WHRRMP treatment areas but within the Draft EBRPD Pallid Manzanita Management Plan area.

EBRPD WHRRMP Treatment Areas

A total of about 656 pallid manzanita plants occur within 7 of EBRPD's proposed WHRRMP treatment areas across 5 parks (ESA 2013). The status of the pallid manzanita within these treatment areas is summarized below.

Redwood Regional Park RTA RD001

Numerous non-native eucalyptus and Monterey pine have already been removed in this WHRRMP treatment area. Vegetation here consists of Monterey pine, eucalyptus forest/plantation, California annual grassland, oak-bay woodland/forest, xeric coastal scrub, broom scrub (non-native French broom), and developed, disturbed, and landscaped areas (ESA 2013). There are approximately 75 pallid manzanita plants in RTA RD001 including 3 mature plants and 72 seedlings.

Huckleberry Botanic Regional Preserve RTA HP002

Vegetation communities within this RTA include northern maritime chaparral and oak-bay woodland/forest. There are approximately 478 pallid manzanita plants in this treatment area including 301 mature plants and177 seedlings. There are an additional 12 pallid manzanita plants located on EBRPD lands outside the treatment area and 326 mature pallid manzanita plants on immediately adjacent and contiguous private property.

Huckleberry Botanic Regional Preserve RTA HP003

Vegetation communities within this treatment area include northern maritime chaparral and oak/bay woodland/forest. There are approximately 11 mature pallid manzanita plants in the treatment area. There are an additional 96 mature pallid manzanita on the adjacent tennis club property.

Sibley Regional Volcanic Park RTA SR005

Vegetation communities within this treatment area include oak-bay woodland/forest, non-native coniferous forest, coyote brush scrub, several types of coastal scrub, California annual grassland, and developed, disturbed, and landscaped areas. As of 2004 there were 3 pallid manzanita plants at Sibley Regional Volcanic Park (ESA 2013). At the time observed these pallid manzanitas were of small to medium size, appeared to be of the same age, and were all in good condition but shaded by Monterey pines. It is possible these individuals were planted or they may have germinated after a disturbance, such as a fire or trail construction. There are historical collections from the vicinity of the "head of San Leandro Creek" (CDFW 2012); thus, there may have been a population of pallid manzanita in this general area historically.

Tilden Regional Park RTA TI011

Vegetation communities within this treatment area include oak-bay woodland/forest, xeric coastal scrub, non-native coniferous forest, redwood forest, riparian woodland, and developed/disturbed/landscaped areas. Pallid manzanita plants occur on a knoll at the western end of the treatment area. The Selby Trail runs through the population. Kanz (2004) reported 8 dead pallid manzanita plants at this site but that the remaining 12 were in very good to excellent condition. The pallid manzanita plants at this site were planted in the 1940s (CDFW 2012), and in 2004 there was no sign of regeneration occurring here (Kanz 2004). While this is a relatively open site, there are coast live oak, redwood, and bay trees within and around the periphery.

Tilden Regional Park RTA TI021

Vegetation communities within this treatment area include oak-bay woodland/forest, nonnative coniferous forest, and developed/disturbed/ landscaped areas. Pallid manzanita occur along Wildcat Canyon Road to the east and north of the Botanical Garden and were also planted in the 1940's (CDFW 2012.). Eight pallid manzanitas were documented within this treatment area by EBRPD in 2004. Kanz (2004) noted that five of these trees were shaded by oaks and several were in poor condition.

Sobrante Ridge Regional Preserve RTA SO001

Vegetation communities within this treatment area include northern maritime chaparral and oak-bay woodland/forest. The northern maritime chaparral here is dominated by pallid manzanita. There are an estimated 454 pallid manzanita plants in the Sobrante Ridge population. Eight plants are within a road easement on contiguous non-EBRPD lands, an estimated 70 plants are located within RTA SO001, and an estimated 376 plants are located on EBRPD lands outside the treatment area. Kanz (2004) noted that shading by native trees appeared to be an increasing threat to manzanitas at this site and that pallid manzanita along the trail had been recently pruned.

Draft EBRPD Pallid Manzanita Management Plan

The Draft EBRPD Pallid Manzanita Management Plan covers all pallid manzanita stands and habitat on EBRPD lands; thus the plan covers nearly 75 percent of all pallid manzanita plants range-wide (ESA 2013). The Draft EBRPD Pallid Manzanita Management Plan has the following goals: (1) manage and expand existing pallid manzanita stands in such a way as to maximize individual plant health, maintain species genetic integrity and diversity, and promote stand regeneration in perpetuity; (2) establish or restore additional pallid manzanita stands in areas that are not subject to fuel management or other incompatible uses; and (3) control the spread of the fungal pathogen, *P. cinnamomi*, within and between pallid manzanita stands. The occurrence of pallid manzanita within the Draft EBRPD Pallid Manzanita Management Plan area that overlaps with the EBRPD WHRRMP treatment areas is described above. An additional 389 pallid manzanita plants occur outside of EBRPD's WHRMMP treatment areas but within the Draft EBRPD Pallid Manzanita Management Plan area; the occurrence of these pallid manzanita plants is summarized below.

Redwood Regional Park RD001

A single mature pallid manzanita was located here in 2010 (ESA 2013). This plant, the easternmost stand on the East Ridge trail, and a stand to north on East Bay Municipal Utility District lands above Pinehurst Road may occur along a continuous cross ridge or divide, suggesting that suitable substrate exists for pallid manzanita in this area. Blue-gum eucalyptus and Monterey pine dominate the tree canopy in this area. There is likely a sparse understory due to the tree canopy.

Huckleberry Botanic Regional Preserve HU001

This area encompasses two knolls dominated by brittleleaf manzanita, but pallid manzanita also occurs on both knolls in areas that had been disturbed about a decade earlier. EBRPD's 2004 census found 12 mature pallid manzanita shrubs at these locations, 2 on the western knoll and 10 on the eastern knoll. Both knolls were characterized as "barrens" with little to no soil development where nothing but manzanita grows. The knolls appear to be surrounded by oak-bay woodland and coastal scrub and are accessible by old fire trails (ESA 2013).

The majority of the Sobrante Ridge population, an estimated 376 plants, occur within this area. The northern maritime chaparral here is dominated by pallid manzanita. A shrub oak was reported to make up about 15 percent of the shrub canopy and was observed to regenerate under the pallid manzanita canopy (ESA 2013).

Effects of the Proposed Project

California Red-Legged Frog

Direct Effects

Any individual California red-legged frog within the treatment areas would be temporarily displaced or shelter-in place during treatment activities. Manual vegetation treatment methods would likely result in temporary harassment of California red-legged frogs by disrupting typical foraging and sheltering activities. California red-legged frogs could be injured or killed during high-impact activities involving the use of heavy equipment within suitable habitat. Any California red-legged frogs that are hiding or aestivating in any burrows that are collapsed by heavy equipment or along skid trails would injured or killed. California red-legged frogs may also be killed by being run over by project-related traffic on roads and in staging areas near suitable habitat.

The potential for injury and mortality of California red-legged frogs would be minimized by implementation of the following avoidance and minimization measures: a Service-approved biologist will provide all contractors and their personnel training in the identification of the California red-legged frog and its habitats and the implementation of the avoidance and minimization measures; a Service-approved biologist will conduct pre-construction surveys of the work area and monitor work within suitable habitat for the California red-legged frog; contractors will minimize the use of heavy equipment during the wet season when California red-legged frogs are most likely to disperse through the action area; a Service-approved biologist will supervise the installation of temporary exclusion fencing around work areas during the wet season; and a Service-approved biologist will relocate any California red-legged frogs within the work area to safety outside of the work area. With implementation of the avoidance and minimization measures, the potential for injury and mortality of the California red-legged frog would be reduced; however, any California red-legged frogs captured and relocated may be stressed and more susceptible to predation.

Implementation of the project would also have a temporary adverse effect on suitable California red-legged frog habitat within the action area during work activities. Disturbance within suitable riparian habitat for the California red-legged frog would be limited to the removal of dead wood, wood debris, and non-native plant species; no living native riparian plant species would be removed. No aquatic breeding habitat for the California red-legged frog would be directly disturbed by the proposed project. However, removal of eucalyptus and other vegetation within California red-legged frog habitat may result in temporary adverse effects to water quality through increased sedimentation in nearby aquatic habitat from overland flow of rainwater over

disturbed soil areas. This would be more likely to occur in treatment areas where large-scale logging or road-building would be conducted, rather than areas only to be thinned. Runoff to streams or other aquatic habitat would also be more likely along steep slopes and less likely where there is a riparian vegetation buffer that stops or slows the overland flow.

The most vulnerable California red-legged frog life stages are eggs and tadpoles, because of the inability to move away from disturbances in their environment. Eggs and tadpoles downstream of vegetation treatment areas could be adversely affected by suspended sediment, which can cause suffocation. In addition, sedimentation downstream could result in reduced food availability for tadpoles if their food source (algae and diatoms) is affected. However, there are no known California red-legged frog breeding areas within the action area (including areas within 500 feet downstream), so direct effects to vulnerable life stages are not anticipated. Juvenile (post-metamorphic) and adult California red-legged frogs are likely to be able to move out of turbid areas but could experience effects from a decrease in food supply if macro-invertebrate populations decrease.

The applicants will minimize the potential for injury and mortality of the California red-legged frog and the degradation of aquatic habitat within the action area by implementing the following avoidance and minimization measures during implementation of the proposed and interconnected actions: (1) trees within 50 feet of watercourses would only be removed by hand felling to avoid disturbance of soils from mechanized equipment; (2) felled trees would be either chipped or lopped and scattered on the treatment areas, and in some cases logs would be retained as a component of sediment/erosion control measures; (3) work would be conducted in the fall (August-November), when vulnerable life stages of the California red-legged frog (tadpoles and egg masses) would not be present; and (4) the applicants will implement a Stormwater Pollution Prevention Plan, spill prevention plan, and other BMPs to minimize the potential for degradation of aquatic habitat within the action area. Additionally, the applicants will minimize the potential for injuring and killing dispersing California red-legged frogs during the wet season by avoiding the use of heavy equipment and major ground disturbing activities on days with a 40 percent or greater chance for rain unless exclusion fencing was installed around the work area prior to the start of the wet season.

California red-legged frogs could become entangled within silt fencing or exclusion fencing. Any California red-legged frogs entangled within silt fencing or exclusion fencing would likely desiccate, starve, or be killed by a predator. The Service-approved biologist will minimize the potential for the entangling, injury, and mortality of California red-legged frogs along silt fencing and exclusion fencing by using only Service-approved fencing material and daily inspecting both the inside and the outside of all fencing and relocating any California red-legged frogs that are entangled or trapped.

California red-legged frogs could become entangled if plastic monofilament netting were used for erosion control. Any California red-legged frogs entangled within plastic monofilament netting would likely desiccate, starve, or be killed by a predator. The applicants will avoid the potential for entangling California red-legged frogs by using natural/biodegradable erosion control measures (*i.e.*, straw wattles, jute, and hay bales) instead of plastic monofilament netting.

California red-legged frogs could be injured or killed if they were exposed to herbicides. Herbicide application will not be conducted within "no spray zones" within the action area imposed by the injunction issued on October 20, 2006, by the U.S. District Court for the Northern District of California for the protection of the California red-legged frog. "No spray zones" establish a buffer of 60 feet for ground applications and 200 feet for aerial applications from the edge of California red-legged frog aquatic and upland habitat (http://www.cdpr.ca.gov/docs/endspec/rl_frog/index.htm). The active ingredients for which the no-spray buffer zones apply include all three herbicides proposed for use: triclopyr (Garlon 4 Ultra), imazapyr (Stalker), and glyphosate (RoundUp). One designated "no spray zone" occurs in the action area at Huckleberry Preserve and Sibley Preserve. If the California red-legged frog did occur in this area, there would be no impacts related to herbicides since no application would occur.

An analysis of the potential for direct effects to the California red-legged frog from toxicity due to exposure to herbicides that would be applied within the action area (outside of designated California red-legged frog "no spray zones") is provided in the Biological Assessment (Appendix E in FEMA 2012). Based on this analysis, adverse effects from direct contact or dietary exposures to sprayed herbicides are not anticipated with appropriate and careful application (*i.e.*, following recommended guidelines, especially those recommending against spraying in or near surface water bodies of the proposed herbicides (*e.g.*, Garlon 4 Ultra, Stalker, and Roundup)). Specific recommendations and BMPs for herbicide application to avoid toxicity effects to California red-legged frog are included in the *Conservation Measures* and summarized below: (1) foliar application of herbicides or other spray application methods would be prohibited within 60 feet of standing or flowing water; (2) only direct application of Service-approved herbicides safe for aquatic application (e.g., Garlon 3A, Stalker, and Roundup, but not Garlon 4 Ultra) would be allowed to be applied to cut stumps within 60 feet of standing or flowing water; (3) no herbicide application would occur within 24 hours of a rain event or on days with a 40 percent chance or greater for rain; (4) foliar application of herbicides or other spray application methods will not be applied when wind speeds exceed 10 miles per hour to reduce likelihood of drift into surface water bodies; (5) herbicide application would be conducted by a State of California Qualified Applicator or by staff under their supervision; (6) no herbicides would be intentionally applied to non-target species; and (7) CDPR regulations will be followed for the labeling, application, storage, disposal, and transport of herbicides. Thus, the Service believes that with the implementation of the proposed BMPs and avoidance and minimization measures during herbicide application that the potential for injury and toxicity to California red-legged frogs or degradation of aquatic habitat will be minimized.

The Biological Assessment (Appendix E in FEMA 2012) also presents an analysis of the potential for toxicity from eucalyptus wood chips, which would be placed on the ground in many parts of the action area to control erosion. Findings indicate that short-term and localized effects on soil microbes, soil invertebrates, and terrestrial plant seedlings may result from exposure to fresh eucalyptus and possibly pine wood chips. Once aged, these chips are expected to be nonhazardous to soil associated organisms. Thus retaining wood chips onsite is expected to have no long-term adverse effects on California red-legged frogs.

The *Conservation Measures* section identifies the general avoidance and minimization measures and BMPs that would be implemented to avoid and minimize effects of the proposed project on

the California red-legged frog. These measures include: timing the proposed action to occur within the approved work windows for the species and avoiding vulnerable life stages; complying with all rules, regulations, best practices, and guidance by the CDPR for herbicide application; ensuring a Service-approved biological monitor oversees work activities; implementing general construction BMPs; and conducting vegetation management activities for habitat restoration. With all BMPs and avoidance measures in place, including species-specific avoidance and minimization measures, the Service expects adult California red-legged frog individuals to temporarily disperse out of the immediate work area and return upon completion of the initial treatment.

Tables 8 and 9 below provide information on the type and quantity of California red-legged frog habitat that would be disturbed or enhanced in the UCB and EBRPD parcels, respectively. All non-developed habitats within 50 feet of U.S. Geological Survey NHD line surface hydrology were considered to be potential non-breeding riparian/aquatic habitat for the California red-legged frog. There is no known breeding habitat for the California red-legged frog within the action area that would be directly disturbed by the proposed and interconnected project activities. All non-developed habitats more than 50 feet but less than 500 feet from U.S. Geological Survey NHD line surface hydrology were considered to be potential upland/dispersal habitat for the California red-legged frog. Although suitable California red-legged frog dispersal habitat also occurs within the action area more than 500 feet from U.S. Geological Survey NHD line surface hydrology, California red-legged frogs are only likely to disperse through these areas on rainy days when high-impact proposed project activities would be avoided unless surrounded by exclusion fencing; therefore, the Service believes that California red-legged frogs are not likely to be adversely affected by proposed and interconnected project activities within areas more than 500 feet from U.S. Geological Survey NHD line surface hydrology. Also, there would be no permanent loss of dispersal habitat for the California red-legged frog within these areas.

Adverse effects to California red-legged frog habitat would be short-term and temporary since BMPs and conservation measures such as the use of hand labor would be used in areas containing California red-legged frog habitat such that there would be less disturbance of soil and habitat (and less potential for injury/mortality). In addition, California red-legged frog upland habitat would be enhanced by the removal of eucalyptus and conversion to native plant species resulting in improved hydrology and water quality within the action area and a greater diversity and abundance of invertebrate prey species. Therefore, the majority of adverse effects to California red-legged frog habitat due to project implementation would be short-term and temporary.

UCB proposed treatment activities will result in the temporary disturbance of a total of 7.2 acres of potential non-breeding riparian/aquatic habitat (areas within 50 feet of NHD line surface hydrology) and 101.9 acres of upland/dispersal habitat (areas between 50 feet and 500 feet from NHD line surface hydrology) for the California red-legged frog. UCB will enhance a total of 2.9 acres of non-breeding riparian/aquatic habitat and 35.8 acres of upland/dispersal habitat by removing non-native eucalyptus and restoring with native plant species (Table 8).

Table 8. California Red-Legged Frog Habitat Disturbance and Enhancement (UCB Claremont Canyon (PDM-PJ-09-CA-2005-11) and Frowning Ridge (PDM-PJ-09-CA-2006-004))

Park	Habitat Type	Short-term Temporary[1] Disturbance (acres)	Enhancement/ Eucalyptus Removal[2] (acres)
Claremont Canyon	Riparian/Aquatic[3]	1.61	0.85
	Upland/Dispersal[4]	29.64	21.80
	Unsuitable[5]	0.27	0.00
Frowning Ridge	Riparian/Aquatic[3]	5.60	2.04
	Upland/Dispersal[4]	72.26	13.99
	Unsuitable	0.61	0.00
TOTAL	**Riparian/Aquatic[3]**	**7.2**	**2.9**
	Upland/Dispersal[4]	**101.9**	**35.8**
	Unsuitable[5]	**0.9**	**0.0**

[1] Short-term temporary = habitat anticipated to return to pre-project conditions or better in less than one year of the initial disturbance with implementation of BMPs and conservation measures including hand labor.
[2] Acres of California red-legged frog habitat enhanced by the removal of eucalyptus and conversion to native plant species.
[3] Riparian/Aquatic = habitat within 50 feet of NHD line surface hydrology.
[4] Upland/Dispersal habitat = habitat between 50 and 500 feet from NHD line surface hydrology.
[5] Unsuitable habitat = developed/landscaped areas

EBRPD treatment activities will result in the temporary disturbance of a total of 65.6 acres of potential non-breeding riparian/aquatic habitat and 453.1 acres of upland/dispersal habitat for the California red-legged frog. EBRPD will enhance a total of 17.1 acres of non-breeding riparian/aquatic habitat and 132.5 acres of upland/dispersal habitat by removing or thinning non-native eucalyptus and restoring with native plant species (Table 9).

The potential for adverse effects to California red-legged frog individuals within the action area exists when work is being conducted in areas that provide suitable habitat for any life stages of the species. The level of effect on the California red-legged frog depends on the activity and type of equipment used. Low-impacts activities such as mowing, hand removal of vegetation, and herbicide application within suitable habitat for California red-legged frogs may temporarily displace California red-legged frogs and disrupt feeding and sheltering activities; however, no California red-legged frogs are likely to be injured or killed during these low-impact activities. High-impact activities involving the use or staging of heavy machinery (*e.g.*, eucalyptus removal) within suitable habitat for the California red-legged frog, however, may crush California red-legged frogs resulting in their injury or mortality. Tables 10, 11, and 12 below summarize for each applicant the acres over which low-impact and high-impact activities

Table 9. California Red-Legged Frog Habitat Disturbance and Enhancement (EBRPD (HMGP 1731-16-34), Tilden-Grizzly-Peak (PDM-PJ-09-CA-2006-004), and Interconnected Actions)

Park	Habitat Type[3]	Short-term Temporary[1] Disturbance (acres)	Enhancement/ Eucalyptus Removal[2] (acres)
Anthony Chabot	Riparian/aquatic	7.88	5.95
	Upland/Dispersal	169.56	71.45
	Unsuitable	2.2	0.00
Claremont Canyon	Upland/Dispersal	35.44	1.92
	Unsuitable	0.83	0.00
Huckleberry	Upland/Dispersal	18.07	0.45
	Unsuitable	0.24	0.00
Kennedy Grove	Riparian/aquatic	3.52	0.96
	Upland/Dispersal	9.52	2.46
	Unsuitable	2.63	0.00
Lake Chabot	Upland/Dispersal	4.19	2.09
Leona Canyon	Upland/Dispersal	2.97	0.00
Redwood	Riparian/aquatic	41.5	8.55
	Upland/Dispersal	2.25	0.56
	Unsuitable	1.9	0.00
Sibley Volcanic	Upland/Dispersal	27.22	3.04
	Unsuitable	0.02	0.00
Sobrante Ridge	Upland/Dispersal	12.5	0.00
	Unsuitable	0.39	0.00
Tilden Park (including Grizzly Peak)	Riparian/aquatic	6.92	1.60
	Upland/Dispersal	139.74	43.6
	Unsuitable	17.04	0.00
Wildcat Canyon	Riparian/aquatic	5.75	0.03
	Upland/Dispersal	31.68	6.98
	Unsuitable	4.85	0.00
Total	**Riparian/aquatic**	65.6	17.1
	Upland/Dispersal	453.1	132.5
	Unsuitable	30.1	0.00

[1] Short-term temporary = habitat anticipated to return to pre-project conditions or better in less than one year of the initial disturbance with implementation of BMPs and conservation measures including hand labor.

[2] Acres of California red-legged frog habitat enhanced by the removal of eucalyptus and conversion to native plant species.

[3] Habitat Type: Riparian/Aquatic = habitat within 50 feet of the NHD line surface hydrology; Upland/Dispersal habitat = habitat between 50 and 500 feet from NHD line surface hydrology.

will occur within suitable California red-legged frog habitat during initial vegetation management activities and follow-up maintenance over the 10-year period.

UCB high-impact activities involving the use and staging of heavy equipment at Claremont Canyon and Frowning Ridge may result in the injury or mortality of California red-legged frogs within a total of 54.7 acres of suitable habitat (Table 10). UCB high- and low-impact activities over 93.7 acres of suitable habitat may temporarily displace California red-legged frogs and disrupt feeding and sheltering activities during initial treatment activities. UCB follow-up vegetation management activities may also temporarily displace California red-legged frogs and disrupt feeding and sheltering activities over 93.7 acres of suitable habitat for between 3 and 6 days annually over the 10-year period at Claremont Canyon and Frowning Ridge (Table 10).

Injury or mortality of California red-legged frogs is unlikely to occur within EBRPD project areas because no heavy equipment would be used within suitable habitat for the California red-legged frog; however, there is the potential that an individual California red-legged frog could be injured or killed by project-related traffic or equipment when dispersing through work and staging areas. EBRPD treatment activities may temporarily displace California red-legged frogs and disrupt feeding and sheltering activities over 588.3 acres of suitable habitat during initial treatment activities (Table 11). EBRPD follow-up vegetation management activities may temporarily displace California red-legged frogs and disrupt feeding and sheltering activities over 588.3 acres of suitable habitat for between 1 and 25 days annually over the 10-year period (Table 11).

The proposed project activities in Oakland project areas (and other areas more than 500 feet from NHD line surface hydrology) are not likely to injure or kill California red-legged frogs or disrupt feeding and sheltering activities because: California red-legged frogs are only likely to disperse through these areas during rainy days; and the potential for injuring any dispersing California red-legged frogs in these areas would be minimized by avoiding work on days with a 40 percent chance or greater for rain unless exclusion fencing was installed around the work areas prior to the start of the wet season.

Since the proposed project will not result in the permanent removal of any suitable habitat for the California red-legged frog, effects to California red-legged frogs in the form of habitat modification are expected to be discountable. The overall effects of the treatment actions on the California red-legged frog are summarized in Table 12 below.

Indirect Effects

Indirect effects to the California red-legged frog could occur through loss of aquatic habitat through sedimentation if it occurs in the long-term. Long-term effects to benthic habitats (*e.g.*, filling of interstitial spaces in aquatic sediments) could result in changes to food resources, as benthic habitats are utilized by many types of invertebrates serving as prey. As described above, BMPs would be implemented to avoid or minimize erosion from disturbed soil areas. Long-term vegetation management and monitoring would include measures for long-term erosion control. Therefore, indirect effects from long-term sedimentation in aquatic habitat would be discountable.

Table 10. UCB Low- and High-Impact Activities within California Red-Legged Frog Habitat (UCB Claremont Canyon (PDM-PJ-09-CA-2005-11) and Frowning Ridge (PDM-PJ-09-CA-2006-004))

Park	Initial Project Implementation		Follow-up Maintenance	
			Low-impact Activities[1]	
	Low-impact Activities[1] (acres)	High-impact Activities[2] (acres)	Acres	Days of Maintenance/ Year[3]
Claremont Canyon	8.32	22.65	30.96	3.10
Frowning Ridge	30.72	32.06	62.78	6.28
TOTAL	**39.0**	**54.7**	**93.7**	**9.4**

[1] Acres of low-impact activities (*e.g.*, mowing, hand removal of vegetation, and herbicide application) within suitable California red-legged frog habitat.

[2] Acres of high-impact activities (*e.g.*, use or staging of heavy machinery such as for eucalyptus removal) within suitable California red-legged frog habitat.

[3] On average, the level of effort for maintenance is equivalent to one day of work per 10 acres per year. The results were rounded to the nearest 0.1 day. Maintenance activities include hand crews, pile burning, weed whipping, and stump spraying, over the 10-year permit period.

Based on the analysis provided in the Biological Assessment (Appendix E in FEMA 2012), indirect effects due to bioaccumulation of herbicides in dietary items (*e.g.*, algae, detritus, terrestrial invertebrates, and small vertebrates) is not expected to be significant based on chemical properties (*e.g.*, log K_{ow}, solubility, sorption potential, and environmental persistence). In addition, none of the known inactive or secondary ingredients of the commercial mixtures (*e.g.*, kerosene, surfactants) have significant bioaccumulation potential.

Potential Beneficial Effects

Vegetation management goals of the applicants include the removal of invasive plant species and/or selective thinning. Following implementation of the proposed project, long-term vegetation management activities would be conducted to control or eliminate invasive plant species. This would result in beneficial effects to the California red-legged frog through the establishment and/or enhancement of upland/dispersal habitat and riparian habitat. California red-legged frogs would also benefit from eucalyptus removal by removing a source of phytochemicals that impairs water quality and affects invertebrate prey communities. Removal of eucalyptus would also benefit California red-legged frogs by increasing the amount of time that aquatic habitats within the action area remain wet. UCB will enhance a total of 2.9 acres of non-breeding riparian/aquatic habitat and 35.8 acres of upland/dispersal habitat for the California red-legged frog by removing non-native eucalyptus and restoring with native plant species (Table 8). EBRPD will enhance a total of 17.1 acres of non-breeding riparian/aquatic habitat and 132.5 acres of upland/dispersal habitat for the California red-legged frog by removing or thinning stands of non-native eucalyptus and restoring with native plant species (Table 9).

Table 11. EBRPD Low- and High-Impact Activities within California Red-Legged Frog Habitat (EBRPD (HMGP 1731-16-34), EBRPD Tilden-Grizzly-Peak (PDM-PJ-09-CA-2006-004), and Interconnected WHRRMP Actions)

Park	Initial Project Implementation		Follow-up Maintenance	
			Low-impact Activities[1] (acres)	
	Low-impact Activities[1] (acres)	High-impact Activities[2] (acres)	Acres	Days of Maintenance/ Year[3]
Anthony Chabot	247.20	0.00	247.20	24.72
Claremont Canyon	35.44	0.00	35.44	3.55
Huckleberry	18.07	0.00	18.07	1.80
Kennedy Grove	13.04	0.00	13.04	1.30
Lake Chabot	4.19	0.00	4.19	0.42
Leona Canyon	2.97	0.00	2.97	0.30
Redwood	43.74	0.00	43.74	4.37
Sibley Volcanic	27.23	0.00	27.23	2.72
Sobrante	12.50	0.00	12.50	1.25
Tilden Park (including Grizzly Peak)	146.65	0.00	146.65	14.65
Wildcat	37.43	0.00	37.43	3.74
TOTAL	**588.3**	**0.0**	**588.3**	**58.9**

[1] Acres of low-impact activities (*e.g.*, mowing, hand removal of vegetation, and herbicide application) within suitable California red-legged frog habitat.

[2] Acres of high-impact activities (*e.g.*, use or staging of heavy machinery such as for eucalyptus removal) within suitable California red-legged frog habitat.

[3] On average, the level of effort for maintenance is equivalent to one day of work per 10 acres per year. The results were rounded to the nearest 0.1 day. Maintenance activities include hand crews, pile burning, weed whipping, and stump spraying, over the 10-year permit period.

Table 12. Summary of Effects to California Red-Legged Frogs from Proposed and Interconnected Actions

Applicant	Non-Breeding Riparian/Aquatic[1] (acres)		Upland/Dispersal[2] (acres)		Low- and High-impact Activities (acres)		
	Temporary[3] Disturbance	Enhanced/ Eucalyptus Removal[4]	Temporary[3] Disturbance	Enhanced/ Eucalyptus Removal[4]	Low-impact Activities (Initial)[5]	Low-impact Activities (Follow-up Maintenance)[6]	High-impact Activities[7]
UCB[8]	7.2	2.9	101.9	35.8	39.0	93.7	54.7
EBRPD[9]	65.6	17.1	453.1	132.5	588.3	588.3	0.0
TOTAL	**72.8**	**20.0**	**555.0**	**168.3**	**627.3**	**682.0**	**54.7**

[1] Non-Breeding Riparian/Aquatic = habitat within 50 feet of the NHD line

[2] Upland/Dispersal habitat = non-developed habitats between 50 and 500 feet from the NHD line

[3] Temporary disturbance = habitat anticipated to return to pre-project conditions or better in less than one year of the initial disturbance with implementation of BMPs and conservation measures including hand labor.

[4] Acres of California red-legged frog habitat enhanced by the removal of eucalyptus and conversion to native plant species.

[5] Acres of low-impact activities (*e.g.*, mowing, hand removal of vegetation, and herbicide application) within suitable California red-legged frog habitat during initial vegetation treatment.

[6] Acres of low-impact activities (*e.g.*, mowing, hand removal of vegetation, and herbicide application) within suitable California red-legged frog habitat during follow-up maintenance activities over the 10-year period.

[7] Acres of high-impact activities (*e.g.*, use or staging of heavy machinery such as for eucalyptus removal) within suitable California red-legged frog habitat.

[8] UCB Claremont Canyon (PDM-PJ-09-CA-2005-11) and Frowning Ridge (PDM-PJ-09-CA-2006-004)

[9] EBRPD (HMGP 1731-16-34), EBRPD Tilden-Grizzly-Peak (PDM-PJ-09-CA-2006-004), and Interconnected WHRRMP Actions

EBRPD's preservation in perpetuity of at least 386.2 acres of core scrub habitat for the Alameda whipsnake may also benefit the California red-legged frog by preserving upland/dispersal habitat for the California red-legged frog within the South and East San Francisco Bay Recovery Unit; however, it is not known at this time if the preserved habitat would be near any suitable aquatic habitat for the California red-legged frog.

Alameda Whipsnake

Any individual Alameda whipsnake within the treatment areas would be temporarily displaced or would shelter-in place within rocky outcrops and burrows during treatment activities. Manual vegetation treatment methods would likely result in the temporary disturbance of Alameda whipsnake breeding, feeding, and sheltering. The use of heavy machinery for vegetation treatment would have the potential to injure and/or kill Alameda whipsnakes by running over them or by collapsing burrows where the Alameda whipsnake may be hiding or hibernating. Alameda whipsnakes may also be killed by being run over by project-related traffic on roads and in staging areas near suitable habitat.

The potential for injury and mortality of Alameda whipsnakes would be minimized by implementation of the following avoidance and minimization measures: a Service-approved biologist will provide all contractors and their personnel training in the identification of the Alameda whipsnake and its habitats and the implementation of the avoidance and minimization measures; a Service-approved biologist will conduct pre-construction surveys of the work area and monitor work within suitable habitat for the Alameda whipsnake; treatment activities involving heavy equipment and/or significant ground disturbance within any areas determined to be suitable Alameda whipsnake habitat would not occur between November 1 and March 31 to avoid collapsing burrows where Alameda whipsnakes may be hibernating; a Service-approved biologist will supervise the installation of temporary exclusion fencing around areas where heavy equipment is operated, including landing areas, access roads, and staging areas; a Service-approved biologist will relocate any Alameda whipsnakes within the work area to safety outside of the work area. With implementation of the avoidance and minimization measures, the potential for injury and mortality of the Alameda whipsnake would be reduced; however, any Alameda whipsnakes captured and relocated may be stressed and more susceptible to predation.

Alameda whipsnakes could become entangled within silt fencing or exclusion fencing. Any Alameda whipsnakes entangled within fencing would likely starve or be killed by a predator. The Service-approved biologist will minimize the potential for the injury and mortality of Alameda whipsnakes along silt fencing and exclusion fencing by using only Service-approved fencing material and daily inspecting both the inside and the outside of all fencing and relocating any Alameda whipsnakes that are trapped.

Alameda whipsnakes could become entangled if plastic monofilament netting were used for erosion control. Any Alameda whipsnakes entangled within plastic monofilament netting would likely starve or be killed by a predator. The applicants will avoid the potential for entangling Alameda whipsnakes by using natural/biodegradable erosion control measures (i.e., straw wattles, jute, and hay bales) instead of plastic monofilament netting.

The applicants will minimize the disturbance of Alameda whipsnake core scrub habitat and rock outcrops by implementing the following: rock outcroppings and native shrubs within 50 feet of rock outcrops would be maintained and protected from vehicles using orange construction fencing; skid trails would be sited a minimum of 10 feet away from core Alameda whipsnake scrub habitat and rock outcrops; and wood chips and landings would not be placed within 50 feet of rock outcrops. With all BMPs and avoidance measures in place, including species-specific avoidance and minimization measures, individual Alameda whipsnakes would be expected to temporarily disperse out of the immediate work area and return upon completion of the initial treatment.

Alameda whipsnakes could be injured or killed if they were hiding or hibernating in brush piles during pile burning. Brush piles that are created during tree removal may attract Alameda whipsnakes. Fences around piles cannot guarantee that there will be no Alameda whipsnake use, and the fences are not feasible to maintain. It is unlikely biologists will find Alameda whipsnakes using piles as hibernacula. Alameda whipsnakes normally hibernate underground in rodent burrows where temperatures are maintained at a constant level. If piles are developed in areas where Alameda whipsnakes may occur, then there may be a chance that they could use the piles temporarily during their active period. Burning piles would produce heat that would transmit into the ground below for up to roughly six inches. The amount of heat transmitted is dependent on residence time (how long the fire burns in one spot and the volume of fuel in the pile). Depth of heat penetration is also dependent on soil moisture as moisture conducts the heat to greater depths, but also attenuates the temperature increases as the moisture needs to be driven off before the temperature can rise above 100 degrees Celsius. The applicants will minimize the potential for injuring or killing Alameda whipsnakes when pile burning by implementing BMPs including: avoiding placing piles on large rodent burrows where Alameda whipsnakes may be hiding or hibernating; lighting the pile from one end (generally the uphill side on slopes) to allow Alameda whipsnakes to escape, rather than lighting the whole pile at once; limiting heat penetration into the ground by limiting the size of material placed in the pile; and avoiding pile burning during the hibernation period for the Alameda whipsnake.

An analysis of the potential for direct effects to Alameda whipsnake from toxicity due to exposure to herbicides that would be applied within the action area is provided in Appendix E of the Biological Assessment (FEMA 2012). Based on this analysis, direct contact and dietary-related adverse effects to Alameda whipsnakes are not anticipated with appropriate and careful application of the proposed herbicides (*e.g.*, Garlon 4 Ultra, Stalker, and Roundup). The applicants will implement the specific recommendations for herbicide application included in the BMPs and the *Conservation Measures* of this biological opinion to avoid toxicity effects to Alameda whipsnakes. Based on the analysis provided in the Biological Assessment (Appendix E in FEMA 2012), indirect effects due to bioaccumulation of herbicides in prey items is not expected to be significant based on chemical properties (*e.g.*, log K_{ow}, solubility, sorption potential, and environmental persistence). In addition, none of the known inactive or secondary ingredients of the commercial mixtures (*e.g.*, kerosene, surfactants) has significant bioaccumulation potential.

Appendix E of the Biological Assessment (FEMA 2012) also presents an analysis of the potential for toxicity from eucalyptus wood chips, which would be placed on the ground in many

parts of the action area to control erosion. These findings suggest that short-term and localized effects on soil microbes, soil invertebrates, and terrestrial plant seedlings may result from exposure to fresh eucalyptus and possibly pine wood chips. Once aged, these chips are expected to be nonhazardous to soil associated organisms. Thus retaining wood chips onsite is not likely to injure or kill Alameda whipsnakes. Also Alameda whipsnakes are not expected to be harmed due to retaining wood chips onsite because the wood chips would not be placed in suitable habitat or near rocky outcrops for the Alameda whipsnake.

One of the goals of the proposed project is to reduce the cover of invasive plant species within the action area that pose a fire hazard (*e.g.*, eucalyptus, Monterey pine, French broom, acacia, etc.). However, vegetation removal activities may result in the introduction and spread of invasive plant species within suitable habitat for the Alameda whipsnake which would degrade the habitat for the Alameda whipsnake. The applicants will implement a 10-year Service-approved monitoring and adaptive management plan including the control of invasive plant species to ensure that sites where vegetation is removed or where wood chips are retained revegetate with native plant species. The Service-approved monitoring and adaptive management plans will include interim and final success criteria for the cover of native plant species and suitable Alameda whipsnake core scrub and foraging/dispersal habitat within the action area and contingency measures in case the success criteria are not being met. The applicants will remove and/or reduce the amount of invasive plant species within their parks and parcels. Vegetation management goals include the continued management to reduce or eliminate invasive plant species on their lands.

An analysis of Alameda whipsnake suitable habitat in consideration of habitat connectivity was conducted to determine the extent of potential effects to Alameda whipsnake habitat. Tables 13, 14, and 15 provide information on the type and quantity of habitat that would be disturbed, lost, enhanced, or created in the UCB, Oakland, and EBRPD parcels, respectively. The potential for adverse effects to Alameda whipsnake individuals within the action area exists when work is being conducted in areas that provide suitable habitat for this species (*i.e.*, shrublands, oak woodlands, grasslands, and riparian areas). The level of effect on the Alameda whipsnake depends on the activity and type of equipment used. Low-impact activities such as mowing, hand removal of vegetation, and herbicide application within suitable habitat for Alameda whipsnakes may temporarily displace Alameda whipsnakes and disrupt feeding, breeding, and sheltering activities; however, no Alameda whipsnakes are likely to be injured or killed during these low-impact activities. High-impact activities involving the use or staging of heavy machinery (*e.g.*, tree and shrub removal) within suitable habitat for the Alameda whipsnake, however, may crush Alameda whipsnakes or their burrows resulting in the injury or mortality of Alameda whipsnakes. Tables 16, 17, and 18 below summarize for each applicant the acres over which low-impact and high-impact activities will occur within suitable Alameda whipsnake habitat during initial vegetation management activities and follow-up maintenance over the 10-year period. The Service believes that the permanent removal of core scrub habitat within Oakland and EBRPD treatment areas due to shrub clearing and shrub thinning may decrease the carrying capacity for Alameda whipsnake populations within the action area. The effects of shrub clearing and shrub thinning on the Alameda whipsnake are discussed under the *EBRPD* section below. Table 19 summarizes the overall effects of the proposed project on the Alameda whipsnake.

Table 13. UCB Acres of Alameda Whipsnake Habitat Disturbed, Enhanced, and Created (UCB Strawberry Canyon, Claremont Canyon, and Frowning Ridge (PDM-PJ-09-2005-003, PDM-PJ-09-CA-2005-11, and PDM-PJ-09-CA-2006-004))

Park	Habitat Type	Existing	Treated[4]	Untreated	Degraded Core[5]	Loss of Core[6]	Enhanced Habitat[7]	Created Habitat[8]	Treated Trees[9]	Unchanged[10]	Expected Future Total[11]
Strawberry Canyon	Core[1]	1.38	0.00	1.38	0.00	0.00	0.65	9.96	0.00	1.38	11.99
	Dispersal/ Foraging[2]	0.00	0.00	0.00	0.00	0.00	0.00	25.95	0.00	0.00	25.95
	Unsuitable[3]	54.95	35.91	19.04	0.00	0.00	0.00	0.00	0.00	18.39	18.39
Claremont Canyon	Core[1]	7.12	0.00	7.12	0.00	0.00	0.27	9.35	0.00	7.12	16.74
	Dispersal/ Foraging[2]	1.56	0.00	1.56	0.00	0.00	0.00	24.10	0.00	1.56	25.66
	Unsuitable[3]	34.13	23.56	0.56	0.00	0.00	0.00	0.11	0.00	0.29	0.4
Frowning Ridge	Core[1]	53.44	0.00	53.44	0.00	0.00	0.02	13.56	0.00	53.44	67.02
	Dispersal/ Foraging[2]	30.96	0.00	30.96	0.00	0.00	0.56	84.95	0.00	30.96	116.47
	Unsuitable[3]	100.78	98.56	2.22	0.00	0.00	0.00	0.05	0.00	1.65	1.70
Total	**Core[1]**	**61.9**	**0.0**	**61.9**	**0.0**	**0.0**	**0.9**	**32.9**	**0.0**	**61.9**	**95.8**
	Dispersal/ Foraging[2]	**32.5**	**0.0**	**32.5**	**0.0**	**0.0**	**0.6**	**135.0**	**0.0**	**32.5**	**168.1**
	Unsuitable[3]	**189.9**	**158.0**	**21.8**	**0.0**	**0.0**	**0.0**	**0.2**	**0.0**	**20.3**	**20.5**

[1] Core Scrub = Coastal scrub, coyote brush scrub, and northern maritime coastal scrub

[2] Dispersal and Foraging = Oak-bay woodlands, riparian woodlands, California annual grasslands, and successional grasslands adjacent to core scrub

[3] Unsuitable habitat = all other vegetation community types that do not meet the criteria for Alameda whipsnake core scrub and/or Alameda whipsnake dispersal and foraging areas

[4] Treated shrub habitat is considered to result in 30 percent degraded core scrub habitat and 70 percent converted to dispersal/foraging habitat. Treated unsuitable habitats are typically the removal or thinning of non-native forest cover. Removal may result in the creation of core scrub habitat or the creation or enhancement of dispersal/foraging habitat. Thinning of non-

native forest habitat is assumed to result in no habitat benefit, and although the area treated would result in successional grasslands within a thinned non-native forest, these areas remain in the unsuitable classification. Treated dispersal/foraging habitat is typically the result of some thinning or removal of native forest cover that would result in more open grassland vegetation types. Treatment of dispersal/foraging habitat is generally assumed to result in no change in total dispersal/foraging habitat.

[5] "Degraded" condition only results from the thinning of core scrub and is the amount of treated core scrub that would remain as shrub islands (assumed to be 30 percent of the amount treated). "Degraded" does not apply to dispersal/foraging or unsuitable habitats, and so those cells reflect zero acres.

[6] "Loss" condition only results from the thinning or removal of core scrub and is the amount of the treated core scrub that would be converted to grassland habitat (generally assumed to be 70 percent of the amount treated although there are some areas where the removal is 100 percent). "Loss" does not apply to either dispersal/foraging or unsuitable habitat types. Acres of core habitat lost are also entered into the "dispersal/foraging enhanced" cell in the table.

[7] The "enhancement" of a total of 0.9 acre of core scrub habitat in UCB treatment areas refers to the conversion of isolated, smaller non-core shrub patches under the existing conditions to larger shrub patches that are contiguous with core scrub habitat in the future condition due to core scrub habitat creation adjacent to these isolated, smaller shrub patches.

[8] "Created Habitat" results from the removal of non-native forest cover that results in the creation of new core scrub habitat or new grassland or oak woodland habitat.

[9] "Treated Trees" indicate the number of acres of non-native forest cover that is thinned and which does not result in a change in habitat category. Non-native forest cover is categorized as unsuitable habitat both before and after treatment although it may ultimately result in openings and enhanced dispersal/foraging habitat.

[10] The "unchanged" column indicates the acres that are untreated and/or areas that do not change their habitat type category.

[11] "Expected Future Total" is the sum of the degraded, enhanced, created, treated trees, and unchanged columns. The "loss" column is not calculated into the total because acres of core habitat lost are also indicated in the acres of dispersal/foraging habitat enhanced.

Table 14. Oakland Acres of Alameda Whipsnake Habitat Disturbance and Creation (PDM-PJ-09-CA-2006-004)

Park	Habitat Type	Existing	Treated[4]	Untreated	Degraded Core[5]	Loss of Core[6]	Enhanced Habitat[7]	Created Habitat[8]	Treated Trees[9]	Unchanged	Expected Future Total[11]
Caldecott Tunnel	Core[1]	4.26	0	4.26	0	0	0	9.74	0	4.26	14
	Dispersal/ Foraging[2]	12.79	0	12.79	0	0	1.94	12.13	0	12.79	26.86
	Unsuitable[3]	36.57	22.58	13.99	0	0	0	0.69	0	12.05	12.74
North Hills-Skyline	Core[1]	46.25	4.5	41.75	0.75	3.75	0	8.5	0	41.75	51
	Dispersal/ Foraging[2]	0.9	0	0.9	0	0	0.00 (3.75)	10.45	0	0.9	15.1
	Unsuitable[3]	21.19	18.95	2.24	0	0	0	0	0	2.24	2.24
TOTAL	**Core[1]**	**50.5**	**4.5**	**46.0**	**0.8**	**3.8**	**0.0**	**18.2**	**0.0**	**46.0**	**65.0**
	Dispersal/ Foraging[2]	**13.7**	**0.0**	**13.7**	**0.0**	**0.0**	**1.9 (3.8)**	**22.6**	**0.0**	**13.7**	**42.0**
	Unsuitable[3]	**57.8**	**41.5**	**16.2**	**0.0**	**0.0**	**0.0**	**0.7**	**0.0**	**143.0**	**15.0**

[1] Core Scrub = Coastal scrub, coyote brush scrub, and northern maritime coastal scrub

[2] Dispersal and Foraging = Oak-bay woodlands, riparian woodlands, California annual grasslands, and successional grasslands adjacent to core scrub

[3] Unsuitable habitat = all other vegetation community types that do not meet the criteria for Alameda whipsnake core scrub and/or Alameda whipsnake dispersal and foraging areas

[4] Treated shrub habitat is considered to result in 30 percent degraded core scrub habitat and 70 percent converted to dispersal/foraging habitat. Treated unsuitable habitats are typically the removal or thinning of non-native forest cover. Removal may result in the creation of core scrub habitat or the creation or enhancement of dispersal/foraging habitat. Thinning of non-native forest habitat is assumed to result in no habitat benefit, and although the area treated would result in successional grasslands within a thinned non-native forest, these areas remain in the unsuitable classification. Treated dispersal/foraging habitat is typically the result of some thinning or removal of native forest cover that would result in more open grassland vegetation types. Treatment of dispersal/foraging habitat is generally assumed to result in no change in total dispersal/foraging habitat.

[5] "Degraded" condition only results from the thinning of core scrub and is the amount of treated core scrub that would remain as shrub islands (assumed to be 30 percent of the amount treated). "Degraded" does not apply to dispersal/foraging or unsuitable habitats, and so those cells reflect zero acres.

[6] "Loss" condition only results from the thinning or removal of core scrub and is the amount of the treated core scrub that would be converted to grass habitat (generally assumed to be 70 percent of the amount treated although there are some areas where the removal is 100 percent). "Loss" does not apply to either dispersal/foraging or unsuitable habitat types. Acres of core habitat lost are also entered into the "dispersal/foraging enhanced" cell in parentheses ( ) in the table.

[7] "Enhanced" foraging/dispersal habitat generally refers to increased habitat connectivity where newly created core scrub habitat is restored adjacent to previously isolated patches of oak woodland and grassland habitat. Instances where the "enhancement" of foraging/dispersal habitat are due to the removal of core scrub habitat and conversion to grassland are shown in parentheses ( ) and are not considered to be a benefit to the Alameda whipsnake.

[8] "Created Habitat" results from the removal of non-native forest cover that results in the creation of new core scrub habitat or new grassland or oak woodland habitat (note: "Created Habitat" does not include areas where eucalyptus forests are only thinned since 50 percent of the eucalyptus canopy would be retained in these areas).

[9] "Treated Trees" indicate the number of acres of non-native forest cover that is thinned and which does not result in a change in habitat category. Non-native forest cover is categorized as unsuitable habitat both before and after treatment although it may ultimately result in openings and enhanced dispersal/foraging habitat.

[10] The "unchanged" column indicates the acres that are untreated and/or areas that do not change their habitat type category.

[11] "Expected Future Total" is the sum of the degraded, enhanced, created, treated trees, and unchanged columns. The "loss" column is not calculated into the total because acres of core habitat lost are also indicated in the acres of dispersal/foraging habitat enhanced.

Table 15. EBRPD Acres of Alameda Whipsnake Habitat Disturbance and Creation (Proposed and Interconnected WHRRMP Actions)

Park	Habitat Type	Existing	Treated[4]	Untreated	Degraded Core[5]	Loss of Core[6]	Enhanced Habitat[7]	Created Habitat[8]	Treated Trees[9]	Unchanged[10]	Expected Future Total[11]
Anthony Chabot	Core[1]	173.00	139.79	33.21	41.94	64.35	0.71	0.00	0.00	33.21	75.86
	Dispersal/ Foraging[2]	96.53	0.00	159.13	0.00	0.00	50.85 (64.35)	0.00	0.00	159.13	274.33
	Unsuitable[3]	750.72	365.79	393.82	0.00	0.00	0.00	0.00	365.51	367.15	732.66
Claremont Canyon	Core[1]	99.41	72.29	27.17	21.69	50.60	0.03	0.00	0.00	27.13	48.85
	Dispersal/ Foraging[2]	39.16	0.00	39.16	0.00	0.00	0.14 (50.60)	5.90	0.00	39.16	95.80
	Unsuitable[3]	13.38	6.85	6.53	0.00	0.00	0.00	0.95	0.00	6.36	7.31
Claremont-Stonewall	Core[1]	0.75	0.53	0.22	0.16	0.37	0.00	0.00	0.00	0.22	0.38
	Dispersal/ Foraging[2]	2.88	0.00	2.88	0.00	0.00	0.00 (0.37)	0.00	0.00	2.88	3.25
	Unsuitable[3]	10.03	9.67	0.36	0.00	0.00	0.00	0.00	9.67	0.36	10.03
Huckleberry	Core[1]	3.72	2.41	1.32	0.72	1.69	0.73	0.00	0.00	1.32	2.77
	Dispersal/ Foraging[2]	11.55	0.00	11.55	0.00	0.00	0.00 (1.69)	0.00	0.00	11.55	13.24
	Unsuitable[3]	2.80	1.83	0.97	0.00	0.00	0.00	0.00	1.83	0.24	2.07
Kennedy Grove	Core[1]	0.83	0.58	0.25	0.17	0.41	0.00	0.00	0.00	0.25	0.42
	Dispersal/ Foraging[2]	2.71	0.00	2.71	0.00	0.00	0.88 (0.41)	0.00	0.00	2.71	4.00
	Unsuitable[3]	11.67	8.16	3.51	0.00	0.00	0.00	0.00	8.16	2.63	10.79
Lake Chabot	Core[1]	4.43	3.32	1.11	1.00	2.32	0.00	0.00	0.00	1.11	2.11
	Dispersal/ Foraging[2]	29.75	0.00	29.75	0.00	0.00	9.14 (2.32)	0.00	0.00	29.75	41.21
	Unsuitable[3]	67.32	53.62	13.70	0.00	0.00	0.00	0.00	53.62	4.56	58.18

Park	Habitat Type	Existing	Treated[4]	Untreated	Degraded Core[5]	Loss of Core[6]	Enhanced Habitat[7]	Created Habitat[8]	Treated Trees[9]	Unchanged[10]	Expected Future Total[11]
Leona Canyon	Core[1]	25.76	18.02	7.74	5.41	12.61	0.00	0.00	0.00	7.74	13.15
	Dispersal/ Foraging[2]	37.97	0.00	37.97	0.00	0.00	0.50 (12.61)	0.43	0.00	37.97	51.51
	Unsuitable[3]	1.34	0.75	0.59	0.00	0.00	0.00	0.00	0.00	0.41	0.41
Redwood	Core[1]	15.73	11.24	4.49	3.37	7.87	0.00	0.00	0.00	4.49	7.86
	Dispersal/ Foraging[2]	27.70	0.62	27.08	0.00	0.00	1.94 (7.87)	1.46	0.00	27.08	38.35
	Unsuitable[3]	120.38	98.18	22.50	0.00	0.00	0.00	0.00	95.40	22.20	117.60
Sibley-Triangle and Island-EBRPD	Core[1]	0.92	0.65	0.27	0.20	0.45	0.00	0.00	0.00	0.27	0.47
	Dispersal/ Foraging[2]	2.09	0.00	2.09	0.00	0.00	0.47 (0.45)	0.41	0.00	2.09	3.42
	Unsuitable[3]	0.91	0.41	0.50	0.00	0.00	0.00	0.00	0.00	0.03	0.03
Sibley Volcanic	Core[1]	17.81	12.30	5.51	3.28	9.02	0.00	0.00	0.00	5.51	8.79
	Dispersal/ Foraging[2]	59.23	0.00	0.00	0.00	0.00	2.23 (9.02)	16.16	0.00	59.23	86.64
	Unsuitable[3]	84.99	79.07	5.92	0.00	0.00	0.00	0.00	62.19	4.41	66.60
Sobrante Ridge	Core[1]	0.64	0.48	0.16	0.14	0.34	0.00	0.00	0.00	0.16	0.30
	Dispersal/ Foraging[2]	11.74	0.00	11.74	0.00	0.00	0.06 (0.34)	0.00	0.00	11.74	12.14
	Unsuitable[3]	5.99	0.08	5.91	0.00	0.00	0.00	0.00	0.00	5.93	5.93
Temescal	Core[1]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Dispersal/ Foraging[2]	0.62	0.00	0.62	0.00	0.00	0.00	0.00	0.00	0.62	0.62
	Unsuitable[3]	0.92	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.92	0.92

Park	Habitat Type	Existing	Treated [4]	Untreated	Degraded Core[5]	Loss of Core[6]	Enhanced Habitat[7]	Created Habitat[8]	Treated Trees[9]	Unchanged [10]	Expected Future Total[11]
Tilden Regional Preserve	Core[1]	45.10	29.94	15.16	8.63	21.31	0.00	0.00	0.00	15.16	23.79
	Dispersal/ Foraging[2]	103.05	0.00	103.05	0.00	0.00	2.53 (21.31)	35.13	0.00	103.05	162.02
	Unsuitable[3]	363.86	283.35	80.51	0.00	0.00	0.00	0.00	246.72	79.48	326.20
Tilden - Grizzly Peak Blvd.	Core[1]	6.55	4.60	1.95	1.38	3.22	0.00	0.00	0.00	1.95	3.33
	Dispersal/ Foraging[2]	7.22	0.00	7.22	0.00	0.00	0.00 (3.22)	0.45	0.00	7.22	10.89
	Unsuitable[3]	20.51	14.62	5.89	0.00	0.00	0.00	0.00	13.81	6.25	20.06
Wildcat Canyon	Core[1]	28.29	26.41	1.88	7.92	18.49	0.00	0.00	0.00	1.88	9.80
	Dispersal/ Foraging[2]	42.96	0.22	12.21	0.00	0.00	0.52 (18.49)	2.36	0.00	42.96	64.33
	Unsuitable[3]	50.91	30.03	20.88	0.00	0.00	0.00	0.00	26.98	21.05	48.03
Total	**Core[1]**	**422.9**	**322.6**	**100.4**	**96.0**	**193.1**	**1.5**	**0.0**	**0.0**	**100.4**	**197.9**
	Dispersal/ Foraging[2]	**475.2**	**0.8**	**447.2**	**0.0**	**0.0**	**69.3 (193.1)**	**62.3**	**0.0**	**537.1**	**861.8**
	Unsuitable[3]	**1505.7**	**952.4**	**562.5**	**0.0**	**0.0**	**0.0**	**1.0**	**883.9**	**522.0**	**1406.8**

[1] Core Scrub = Coastal scrub, coyote brush scrub, and northern maritime coastal scrub

[2] Dispersal and Foraging = Oak-bay woodlands, riparian woodlands, California annual grasslands, and successional grasslands adjacent to core scrub

[3] Unsuitable habitat = all other vegetation community types that do not meet the criteria for Alameda whipsnake core scrub and/or Alameda whipsnake dispersal and foraging areas

[4] Treated shrub habitat is considered to result in 30 percent degraded core scrub habitat and 70 percent converted to dispersal/foraging habitat. Treated unsuitable habitats are typically the removal or thinning of non-native forest cover. Removal may result in the creation of core scrub habitat or the creation or enhancement of dispersal/foraging habitat. Thinning of non-

native forest habitat is assumed to result in no habitat benefit, and although the area treated would result in successional grasslands within a thinned non-native forest, these areas remain in the unsuitable classification. Treated dispersal/foraging habitat is typically the result of some thinning or removal of native forest cover that would result in more open grassland vegetation types. Treatment of dispersal/foraging habitat is generally assumed to result in no change in total dispersal/foraging habitat.

[5] "Degraded" condition only results from the thinning of core scrub and is the amount of treated core scrub that would remain as shrub islands (assumed to be 30 percent of the amount treated). "Degraded" does not apply to dispersal/foraging or unsuitable habitats, and so those cells reflect zero acres.

[6] "Loss" condition only results from the thinning or removal of core scrub and is the amount of the treated core scrub that would be converted to grass habitat (generally assumed to be 70 percent of the amount treated although there are some areas where the removal is 100 percent). "Loss" does not apply to either dispersal/foraging or unsuitable habitat types. Acres of core habitat lost are also entered into the "dispersal/foraging enhanced" cell in parentheses ( ) in the table.

[7] "Enhanced" foraging/dispersal habitat generally refers to increased habitat connectivity where newly created foraging/dispersal habitat is restored adjacent to previously isolated patches of oak woodland and grassland habitat. Instances where the "enhancement" of foraging/dispersal habitat are due to the removal of core scrub habitat and conversion to grassland are shown in parentheses ( ) and are not considered to be a benefit to the Alameda whipsnake.

[8] "Created Habitat" results from the removal of non-native forest cover that results in the creation of new core scrub habitat or new grassland or oak woodland habitat (note: "Created Habitat" does not include areas where eucalyptus forests are only thinned since 50 percent of the eucalyptus canopy would be retained in these areas).

[9] "Treated Trees" indicate the number of acres of non-native forest cover that is thinned and which does not result in a change in habitat category. Non-native forest cover is categorized as unsuitable habitat both before and after treatment although it may ultimately result in openings and enhanced dispersal/foraging habitat.

[10] The "unchanged" column indicates the acres that are untreated and/or areas that do not change their habitat type category.

[11] "Expected Future Total" is the sum of the degraded, enhanced, created, treated trees, and unchanged columns. The "loss" column is not calculated into the total because acres of core habitat lost are also indicated in the acres of dispersal/foraging habitat enhanced.

Table 16. UCB Low- and High-Impact Activities within Alameda Whipsnake Habitat

Park	Initial Project Implementation		Follow-up Maintenance	
			Low-impact Activities[1]	
	Low-impact Activities[1] (acres)[3]	High-impact Activities[2] (acres)[3]	Acres[3]	Days of Maintenance/ Year[4]
Strawberry Canyon	0.0	0.0	37.9	3.8
Claremont Canyon	0.0	0.2	42.4	4.2
Frowning Ridge	0.0	0.1	183.5	18.3
TOTAL	**0.0**	**0.3**	**263.8**	**26.3**

[1] Acres of low-impact activities (*e.g.*, mowing, hand removal of vegetation, and herbicide application) within suitable Alameda whipsnake habitat.

[2] Acres of high-impact activities (*e.g.*, use or staging of heavy machinery such as for tree and shrub removal) within suitable Alameda whipsnake habitat.

[3] Acres includes only the acres of suitable Alameda whipsnake habitat (core scrub and/or dispersal and foraging) identified under the existing conditions or in the future vegetation management goal.

[4] On average, the level of effort for maintenance is equivalent to one day of work per 10 acres per year. The results were rounded to the nearest 0.1 day. Maintenance activities include hand crews, pile burning, weed whipping, and stump spraying, over the 10-year permit period.

Table 17. Oakland Low- and High-Impact Activities within Alameda Whipsnake Habitat

Park	Initial Project Implementation			Follow-up Maintenance	
	Low-impact Activities[1] (acres)[4]	Loss of Core Scrub[2] (acres)[4]	High-impact Activities[3] (acres)[4]	Low-impact Activities[1]	
				Acres[4]	Days of Maintenance/ Year[5]
Caldecott Tunnel	0.0	0.0	0.3	40.9	4.1
North Hills-Skyline	13.0	3.8	0.3	66.1	6.6
TOTAL	**13.0**	**3.8**	**0.6**	**107.0**	**10.7**

[1] Acres of low-impact activities (*e.g.*, mowing, hand removal of vegetation, and herbicide application) within suitable Alameda whipsnake habitat.

[2] Acres of core scrub habitat removed and converted to foraging/dispersal habitat.

[3] Acres of high-impact activities (*e.g.*, use or staging of heavy machinery such as for tree and shrub removal) within suitable Alameda whipsnake habitat.

[4] Acres includes only the acres of suitable Alameda whipsnake habitat (core scrub and/or dispersal and foraging) identified under the existing conditions or in the future vegetation management goal.

[5] On average, the level of effort for maintenance is equivalent to one day of work per 10 acres per year. The results were rounded to the nearest 0.1 day. Maintenance activities include hand crews, pile burning, weed whipping, and stump spraying, over the 10-year permit period.

Table 18. EBRPD Low- and High-Impact Activities within Alameda Whipsnake Habitat (Proposed and Interconnected Actions)

Park	Initial Project Implementation			Follow-up Maintenance	
	Low-impact Activities[1] (acres)[4]	Loss of Core Scrub[2] (acres)[4]	High-impact Activities[3] (acres)[4]	Low-impact Activities[1]	
				Acres	Days of Maintenance/ Year[5]
Anthony Chabot	139.8	64.4	104.9	349.3	35.0
Claremont Canyon	72.3	50.6	1.8	144.7	14.4
Claremont-Stonewall	0.5	0.4	0.0	3.6	0.4
Huckleberry	2.4	1.7	0.3	16.0	1.7
Kennedy Grove	0.6	0.4	0.8	4.4	0.4
Lake Chabot	3.4	2.3	9.0	43.3	4.4
Leona Canyon	18.0	12.6	0.0	64.7	6.5
Redwood	11.9	7.9	12.6	46.2	4.6
Sibley-Triangle and Island	0.7	0.5	0.0	3.9	0.4
Sibley Volcanic	12.3	9.0	11.7	95.4	9.5
Sobrante	0.5	0.3	0.3	12.4	1.2
Temescal	0.0	0.0	0.0	0.6	0.1
Tilden	29.9	21.3	49.5	185.8	18.6
Tilden-Grizzly Peak	4.6	3.2	0.0	14.2	1.4
Wildcat	26.6	18.5	5.6	74.1	7.5
TOTAL	**323.5**	**193.1**	**196.5**	**1058.6**	**106.1**

[1] Acres of low-impact activities (*e.g.*, mowing, hand removal of vegetation, and herbicide application) within suitable Alameda whipsnake habitat.

[2] Acres of core scrub habitat removed and converted to foraging/dispersal habitat.

[3] Acres of high-impact activities (*e.g.*, use or staging of heavy machinery such as for tree and shrub removal) within suitable Alameda whipsnake habitat.

[4] Acres includes only the acres of suitable Alameda whipsnake habitat (core scrub and/or dispersal and foraging) identified under the existing conditions or in the future vegetation management goal.

[5] On average, the level of effort for maintenance is equivalent to one day of work per 10 acres per year. The results were rounded to the nearest 0.1 day. Maintenance activities include hand crews, pile burning, weed whipping, and stump spraying, over the 10-year permit period.

Table 19. Summary of Effects of FEMA East Bay Hills Project on Alameda Whipsnakes

Applicant	Temporary Disturbance[1] (acres)		Core Scrub (acres)			Dispersal/Foraging (acres)		Low- and High-impact Activities (acres)		
	Core Scrub	Dispersal/ Foraging	Loss[2]	Degraded[3]	Create[4]	Create[5]	Enhance[6]	Initial Low-impact[7]	Initial High-impact[8]	Follow-up Low-impact[9]
UCB[10]	0.0	0.0	0.0	0.0	32.9	135.0	0.6	0.0	0.3	263.8
Oakland[11]	4.5	0.0	3.8	0.8	18.2	22.6	1.9 (3.8)	13.0	0.6	107.0
EBRPD[12]	322.6	0.8	193.1	96.0	0.0	62.3	69.3 (193.1)	323.5	196.5	1058.6
TOTAL	**327.1**	**0.8**	**196.9**	**96.8**	**51.1**	**219.9**	**71.8 (196.9)**	**336.5**	**197.4**	**1429.4**

[1] Temporary Disturbance includes areas of suitable habitat that are treated in the initial project.

[2] Loss of core scrub results from the thinning or removal of core scrub and is the amount of the treated core scrub that would be converted to grass habitat (generally assumed to be 70 percent of the amount treated although there are some areas where the removal is 100 percent). Acres of core habitat lost are also entered in ( ) into the "dispersal/foraging enhanced" cell in the table.

[3] "Degraded" core scrub habitat refers to the fragmentation of core scrub habitat due to thinning of core scrub to create shrub islands. The remaining shrubs islands (assumed to be 30 percent of the amount treated) are referred to as a "degraded" core scrub habitat while the removal of core scrub habitat between the shrub islands (assumed to be 70 percent) is referred to as a "loss" of core scrub habitat.

[4] "Created" core scrub habitat results from the removal of non-native forest cover that results in the creation of new core scrub habitat (note: does not include the "enhancement" of 0.9 acre of core scrub habitat in UCB treatment areas due to improved habitat connectivity from the connection of isolated shrub patches to larger core scrub patches).

[5] "Created" dispersal/foraging habitat results from the removal of non-native forest cover that results in the creation of new scrub, grassland, or oak woodland habitat (note: "Created Habitat" does not include areas where eucalyptus forests are only thinned since 50 percent of the eucalyptus canopy would be retained in these areas).

[6] "Enhanced" foraging/dispersal habitat generally refers to increased habitat connectivity where newly created foraging/dispersal or core scrub habitat is restored adjacent to previously isolated patches of oak woodland and grassland habitat. Instances where the "enhancement" of foraging/dispersal habitat are due to the removal of core scrub habitat and conversion to grassland are shown in parentheses ( ) and are not considered a benefit to the Alameda whipsnake.

[7] Acres of low-impact activities (*e.g.*, mowing, hand removal of vegetation, and herbicide application) within suitable Alameda whipsnake habitat during initial vegetation treatment.

[8] Acres of high-impact activities (*e.g.*, use or staging of heavy machinery such as for tree and shrub removal) within suitable Alameda whipsnake habitat during initial vegetation treatment.

[9] Acres of low-impact activities (*e.g.*, mowing, hand removal of vegetation, and herbicide application) within suitable Alameda whipsnake habitat during follow-up maintenance activities over the 10-year period.

[10] UCB Strawberry Canyon, Claremont Canyon, and Frowning Ridge (PDM-PJ-09-2005-003, PDM-PJ-09-CA-2005-11, and PDM-PJ-09-CA-2006-004))

[11] Oakland Caldecott Tunnel and North Hills-Skyline (PDM-PJ-09-CA-2006-004)

[12] EBRPD PDM-PJ-09-CA-2006-004, HMGP 1731-16-34, and Interconnected WHRRMP Actions

UCB: Claremont Canyon, Strawberry Canyon, and Frowning Ridge

UCB initial treatment activities at Claremont Canyon, Strawberry Canyon, and Frowning Ridge would be limited to areas unsuitable for Alameda whipsnakes such as eucalyptus and other non-native forests. Therefore, no suitable Alameda whipsnake habitat would be disturbed during UCB initial treatment activities (Table 13). However, Alameda whipsnakes within a 0.2-acre area at Claremont Canyon and a 0.1-acre area at Frowning Ridge may be temporarily displaced or possibly injured or killed during the use of heavy machinery during UCB initial treatment activities adjacent to suitable habitat (Table 16). UCB treatment activities will result in the creation of about 32.9 acres of core scrub habitat for the Alameda whipsnake where non-native forests (primarily eucalyptus) are converted to core scrub habitat. UCB treatment activities will also result in the enhancement of about 0.9 acre of core scrub habitat for the Alameda whipsnake where smaller, isolated patches of non-core scrub habitat under the existing conditions are joined to larger core scrub patches post-treatment due to the creation of core scrub habitat adjacent to these isolated, smaller shrub patches. UCB treatment activities will also result in the creation of about 135.0 acres of foraging/dispersal habitat for the Alameda whipsnake due to the conversion of non-native forests to grassland or oak woodland (Table 13). UCB treatment activities will also enhance of about 0.6 acre of foraging/dispersal habitat for the Alameda whipsnake where smaller, isolated patches of grassland and oak woodland habitats under the existing conditions are joined to larger core scrub, grassland, and oak woodland habitats patches post-treatment due to the creation of suitable habitat adjacent to these isolated, smaller patches of grassland and oak woodland. UCB follow-up vegetation treatment and maintenance activities may result in the temporary displacement of Alameda whipsnakes and disruption of feeding, sheltering, and breeding activities over a total of 263.8 acres of restored habitat for the Alameda whipsnake at Strawberry Canyon, Claremont Canyon, and Frowning Ridge for between 4 and 18 days every year over the 10-year period (Table 16). UCB will minimize the level of adverse effects on Alameda whipsnakes during initial and follow-up vegetation treatment and maintenance activities by implementing the conservation measures and BMPs in this biological opinion. UCB will implement a 10-year Service-approved monitoring and adaptive management plan to ensure that the restored areas meet the interim and final success criteria for revegetating with native plant species and suitable Alameda whipsnake habitat.

Oakland: Caldecott Tunnel and North-Hills Skyline

Oakland will thin shrubs (removal of up to 70 percent of shrub cover with the remaining 30 percent of shrub cover retained in shrub islands) over about 4.5 acres of Alameda whipsnake core scrub habitat at North Hills-Skyline. This shrub thinning will result in the permanent loss of about 3.75 acres of core scrub habitat (in between the shrub islands) by converting to foraging/dispersal habitat (grassland) in between the shrub islands (Table 14). The Service believes that the quality of the remaining 0.75 acre of core scrub habitat (the retained shrub islands) will be degraded due to habitat fragmentation (see the discussion of the effects of shrub thinning in the *EBRPD* section below). However, Oakland will create about 18.2 acres of core scrub habitat for the Alameda whipsnake by removing non-native trees and converting to core scrub habitat (Table 14). Oakland will also enhance 1.9 acres of foraging/dispersal habitat for the Alameda whipsnake by connecting previously isolated patches of oak woodland and grassland habitat to newly created core scrub habitat. Oakland will also create 22.6 acres of

foraging/dispersal habitat for the Alameda whipsnake due to the removal of non-native trees and conversion to grassland and oak woodland habitats (Table 14).

Alameda whipsnakes within a 0.6-acre area will be temporarily displaced or possibly injured or killed during the use of heavy machinery within suitable habitat during Oakland initial treatment activities (Table 17). Low-impact initial treatment activities (*e.g.*, mowing, hand removal of vegetation, and herbicide application) may result in the temporary displacement of Alameda whipsnakes and disruption of feeding, sheltering, and breeding activities within 13.0 acres of suitable habitat. Follow-up vegetation treatment and maintenance activities may result in the temporary displacement of Alameda whipsnakes and disruption of feeding, sheltering, and breeding activities within a total of 107.0 acres of restored habitat for the Alameda whipsnake for between 4 and 7 days every year over the 10-year period (Table 17). Oakland will minimize effects to Alameda whipsnakes during initial and follow-up vegetation treatment and maintenance activities by implementing the conservation measures and BMPs in this biological opinion.

The Service believes the permanent removal of 3.75 acres of core scrub habitat due to shrub thinning and conversion to foraging/dispersal habitat may reduce the carrying capacity for Alameda whipsnakes within the action area. Oakland will minimize adverse effects to Alameda whipsnakes by converting about 18.2 acres of non-native forest to core scrub habitat. Oakland will implement a 10-year Service-approved monitoring and adaptive management plan to ensure that the restored areas meet the interim and final success criteria for revegetating with native plant species and suitable Alameda whipsnake habitat.

EBRPD: PDM-PJ-09-CA-2006-004, HMGP 1731-16-34, and Interconnected WHRRMP Projects

EBRPD will thin shrubs (removal of up to 70 percent of shrub cover with the remaining 30 percent of shrub cover retained in shrub islands) over 322.6 acres of Alameda whipsnake core scrub habitat. Shrub islands are to be approximately 50 feet in diameter and spaced 50 feet apart. This shrub thinning will result in the permanent loss of up to 193.1 acres of core scrub habitat (in between the shrub islands) by converting to foraging/dispersal habitat (grassland) in between the shrub islands (Table 15). EBRPD will compensate for the permanent loss of 193.1 acres of core scrub habitat by preserving in perpetuity and managing for the benefit of the Alameda whipsnake at least 386.2 acres of core scrub habitat for the Alameda whipsnake at a Service-approved location within designated critical habitat. Currently, EBRPD is proposing to purchase and preserve and manage in perpetuity at least 386.2 acres of core scrub habitat within an important Alameda whipsnake dispersal corridor within recovery unit 6. The preservation of habitat within recovery unit 6 is important because of its significance as a dispersal corridor for the Alameda whipsnake between recovery units 1 and 2. Although EBRPD's proposed project will result in a net loss of core scrub habitat within recovery units 1, 2, and 6, the Service believes that the preservation and management of 386.2 acres of core scrub habitat at a Service-approved location in recovery unit 6 will benefit the Alameda whipsnake by preserving in perpetuity an important dispersal corridor between recovery units 1 and 2. Maintaining connectivity between recovery units 1 and 2 allows for dispersal between units for the subspecies and allows for genetic exchange among all three units (Service 2006b). The preserved core scrub habitat will provide

breeding, feeding, or sheltering commensurate with or better than habitat lost as a result of the effects from the proposed project.

Currently, there is no relevant research data available to determine the overall effects of the proposed shrub thinning (removal of between 50 and 70 percent of shrub cover) and creation of the shrub island mosaic on the Alameda whipsnake. The Service believes that the quality of the remaining 96.0 acres of core scrub habitat (the retained shrub islands) will be degraded due to habitat fragmentation resulting in a reduction in the carrying capacity of the core scrub habitat for the Alameda whipsnake. However, there is the potential that the Alameda whipsnake could benefit from the opening up of the shrub canopy resulting in improved foraging, dispersal, and basking habitat for the Alameda whipsnake, especially if suitable rock outcrops are uncovered. EBRPD will develop, implement, and fund a Service-approved study evaluating the effects of the proposed shrub thinning on the Alameda whipsnake. The study will benefit the Alameda whipsnake in the long-term by providing EBRPD and other habitat managers guidance on how best to manage shrub habitat for the benefit of the Alameda whipsnake.

EBRPD will create about 62.3 acres of foraging/dispersal habitat for the Alameda whipsnake due to the removal of non-native trees and conversion to grassland and oak woodland habitats that are contiguous with core scrub habitat (Table 15). EBRPD will implement a 10-year Service-approved monitoring and adaptive management plan to ensure that the restored areas meet the interim and final success criteria for revegetating with native plant species and suitable Alameda whipsnake habitat. EBRPD will enhance about 69.3 acres of foraging/dispersal habitat for the Alameda whipsnake by connecting previously isolated patches of oak woodland and grassland habitat to core scrub habitat and newly created foraging/dispersal habitat (Table 15). EBRPD will also thin eucalyptus forests over about 800 acres. Since 50 percent of the eucalyptus canopy would be retained in these areas, the Service does not believe that any suitable Alameda whipsnake habitat will be created where eucalyptus forest is only thinned. However, there is the potential that some foraging/dispersal habitat could be enhanced where eucalyptus is removed adjacent to core scrub habitat for the Alameda whipsnake.

Alameda whipsnakes within a 196.5-acre area may be temporarily displaced or possibly injured or killed during the use of heavy machinery within suitable habitat during EBRPD initial treatment activities (Table 18). Low-impact initial treatment activities (*e.g.,* mowing, hand removal of vegetation, and herbicide application) may temporarily displace Alameda whipsnakes and disrupt feeding, sheltering, and breeding activities within 323.5 acres of suitable habitat. Follow-up vegetation treatment and maintenance activities may temporarily displace Alameda whipsnakes and disrupt feeding, sheltering, and breeding activities over a total of 1,058.6 acres of habitat for the Alameda whipsnake for between 1 and 35 days every year over the 10-year period (Table 18). EBRPD will minimize effects to Alameda whipsnakes during initial and follow-up vegetation treatment and maintenance activities by implementing the conservation measures and BMPs in this biological opinion.

The permanent removal of 193.1 acres of core scrub habitat due to shrub thinning and conversion to foraging/dispersal habitat may reduce the carrying capacity for Alameda whipsnakes within the action area. EBRPD will minimize effects to Alameda whipsnakes by preserving and managing in perpetuity at least 386.2 acres of core scrub habitat for the Alameda whipsnake at a

Service-approved location under a Service-approved compensation plan with a long-term endowment for managing the preserved habitat.

Summary

The conservation measures for the proposed project have been designed so that each applicant is responsible for the successful implementation of their own avoidance, minimization, restoration, and compensation measures and thus not dependent on the restoration and compensation being implemented by the other applicants. Therefore, any changes to the proposed project being implemented by one of the applicants would require reinitiation of formal consultation only on that applicant's portions of the proposed project and thus would not delay the implementation of the proposed project by the other applicants.

UCB will minimize the effects of their proposed vegetation management and fuels reduction projects at Strawberry Canyon, Claremont Canyon, and Frowning Ridge on the Alameda whipsnake by creating about 167.9 acres of suitable habitat for the Alameda whipsnake consisting of about 32.9 acres of core scrub habitat (Table 19). UCB will also enhance about 0.9 acre of core scrub habitat and 0.6 acre of foraging/dispersal habitat for the Alameda whipsnake by connecting previously isolated patches of habitat. Oakland will minimize the effects of their proposed vegetation management and fuels reduction projects at Caldecott Tunnel and North Hills-Skyline on the Alameda whipsnake by creating about 40.8 acres of suitable habitat for the Alameda whipsnake consisting of about 18.2 acres of core scrub habitat (Table 19). Oakland will also enhance about 1.9 acres of foraging/dispersal habitat for the Alameda whipsnake by connecting previously isolated patches of habitat. EBRPD will compensate for the effects of their proposed and interconnected vegetation management and fuels reduction projects on the Alameda whipsnake by preserving and managing in perpetuity at a Service-approved location at least 386.2 acres of core scrub habitat for the Alameda whipsnake at a Service-approved location. EBRPD will also create about 62.3 acres of foraging/dispersal habitat, enhance about 69.3 acres of foraging/dispersal habitat, and enhance about 1.5 acres of core scrub habitat by connecting previously isolated patches of habitat (Table 19).

Alameda Whipsnake Critical Habitat

The proposed and interconnected actions will result in the direct disturbance of designated critical habitat for the Alameda whipsnake within Units 1, 2, and 6 within the action area. Tables 20, 21, and 22 below summarize for each applicant how many acres of core scrub (PCE 1) and foraging/dispersal habitat (PCE 2) would be lost, enhanced, or created within each critical habitat unit. The conversion of non-native forest (*e.g.*, eucalyptus, Monterey pine, acacia) to primarily oak woodland and grassland habitat (PCE 2) and some core scrub habitat (PCE 1) in UCB and Oakland treatment areas will benefit Alameda whipsnake critical habitat by increasing the spatial extent of PCEs and increasing habitat connectivity. EBRPD's proposed thinning of eucalyptus forest is not likely to result in a significant increase in PCEs because 50 percent of the eucalyptus canopy cover would be retained in EBRPD treatment areas; however, there is the potential for PCEs to be enhanced where eucalyptus trees are removed adjacent to core scrub habitat.

Table 20. UCB Effects on Alameda Whipsnake Designated Critical Habitat (UCB Strawberry Canyon, Claremont Canyon, and Frowning Ridge (PDM-PJ-09-2005-003, PDM-PJ-09-CA-2005-11, and PDM-PJ-09-CA-2006-004))

Park	Critical Habitat Unit	Total Acres within Critical Habitat	Existing Conditions (acres)			Expected Future Conditions (acres)			Net Change (acres)		
			PCE 1	PCE 2	Acres without PCEs	PCE 1[1]	PCE 2	Acres without PCEs	PCE 1	PCE 2	Acres without PCEs
Strawberry Canyon	1	10.31	1.02	0.00	9.29	2.35	3.40	4.56	+1.33	+3.40	-4.73
	6	13.15	0.37	0.00	12.78	3.36	7.66	2.13	+2.99	+7.66	-10.65
Claremont Canyon	6	42.81	7.12	1.56	34.12	15.34	27.06	0.40	+8.22	+25.50	-33.72
Frowning Ridge	1	9.87	2.44	4.05	3.38	2.77	6.50	0.60	+0.33	+2.45	-2.78
	6	174.36	50.74	26.75	96.87	61.93	111.71	0.72	+11.19	+84.96	-96.15
TOTAL ACRES	**1**	**20.18**	**3.46**	**4.05**	**12.67**	**5.12**	**9.90**	**5.16**	**+1.66**	**+5.85**	**-7.51**
	6	**230.32**	**58.23**	**28.31**	**143.77**	**80.63**	**146.43**	**3.25**	**+22.40**	**+118.12**	**-140.52**
	TOTAL	**250.50**	**61.69**	**32.36**	**156.44**	**85.75**	**156.33**	**8.41**	**+24.06**	**+123.97**	**-148.03**

[1] Expected future acres of PCE 1 are a weighted average of the untreated PCE 1 plus (PCE 1 created minus 15 percent)

Table 21. Oakland Effects on Alameda Whipsnake Designated Critical Habitat (PDM-PJ-09-CA-2006-004)

Park	Critical Habitat Unit	Total Acres within Critical Habitat	Existing Conditions (acres)			Expected Future Conditions (acres)			Net Change (acres)		
			PCE 1	PCE 2	Acres without PCEs	PCE 1[1]	PCE 2	Acres without PCEs	PCE 1	PCE 2	Acres without PCEs
North Hills – Skyline	6	62.09	43.21	0.00	18.88	47.96	13.84	0.29	+4.75	+13.84	-18.59

[1] Expected acres of PCE 1 in North Hills-Skyline are a weighted average of the untreated PCE 1 plus (PCE 1 created minus 15 percent).

Table 22. Alameda Whipsnake Designated Critical Habitat (EBRPD (HMGP 1731-16-34) and Interconnected WHRRMP Actions)

Park	Critical Habitat Unit	Total Acres within Critical Habitat	Existing Conditions (acres)			Expected Future Conditions (acres)			Net Change (acres)		
			PCE 1	PCE 2	Acres without PCEs	PCE 1[1]	PCE 2	Acres without PCEs	PCE 1	PCE 2	Acres without PCEs
Anthony Chabot	2	16.16	8.19	6.58	1.39	2.89	12.18	1.09	-5.30	+5.60	-0.30
Claremont Canyon	6	145.06	96.25	37.11	11.7	44.16	94.42	6.55	-52.09	+57.31	-5.15
Claremont Canyon-Stonewall	6	11.85	0.75	2.88	8.22	0.36	3.27	8.22	-0.39	+0.39	0.00
Huckleberry	2	1.62	0.00	1.16	0.46	0.01	1.31	0.30	+0.01	+0.15	-0.16
	6	16.34	3.71	10.35	2.28	2.14	12.19	2.01	-1.57	+1.84	-0.27
Kennedy Grove	1	14.77	0.83	2.45	11.49	0.4	3.66	10.71	-0.43	+1.21	-0.78
Redwood	2	88.47	7.84	6.74	73.85	3.78	12.61	72.04	-4.06	+5.87	-1.81
Sibley Island	6	3.84	0.92	2.03	0.89	0.44	3.39	0.01	-0.48	+1.36	-0.88
Sibley Volcanic Regional Preserve	6	161.28	17.75	59.03	84.5	8.28	86.37	66.63	-9.47	+27.34	-17.87
Tilden Regional	1	447.11	42.28	81.19	323.64	21.66	136.03	289.42	-20.62	+54.84	-34.22
Tilden-Grizzly Peak	1	34.15	6.42	7.22	20.51	3.06	11.03	20.06	-3.36	+3.81	-0.45
Wildcat Canyon	1	95.51	24.42	31.63	39.46	7.42	50.99	37.1	-17.00	+19.36	-2.36
TOTAL ACRES	**1**	**591.54**	**73.95**	**122.49**	**395.10**	**32.54**	**201.71**	**357.29**	**-41.41**	**+79.22**	**-37.81**
	2	**106.25**	**16.03**	**14.48**	**75.70**	**6.68**	**26.10**	**73.43**	**-9.35**	**+11.62**	**-2.27**
	6	**322.03**	**115.67**	**101.05**	**105.31**	**53.24**	**187.45**	**81.41**	**-62.43**	**+86.40**	**-23.90**
	TOTAL	**1019.82**	**205.65**	**238.02**	**576.11**	**92.46**	**415.26**	**512.13**	**-113.19**	**+177.24**	**-63.98**

[1] Expected acres of PCE 1 are equal to a weighted average of the untreated PCE 1 plus (30 percent of the treated PCE 1 minus 15 percent).

The retention of wood chips onsite will not directly affect the PCEs because the wood chips would not be placed within suitable habitat (PCE 1 or PCE 2) for the Alameda whipsnake and would be placed more than 50 feet from rocky outcrops (PCE 3). However, areas where vegetation is removed and wood chips are retained are likely to become covered with non-native invasive plant species (*e.g.*, French broom) which could act as a seed source for further spread of invasive plant species into adjacent areas with PCEs. This would result in a degradation of the PCEs within adjacent areas. The applicants will minimize the potential for degradation of PCEs due to the spread of invasive plant species by implementing a Service-approved 10-year monitoring and adaptive management plan with interim and final success criteria to ensure that the treatment areas revegetate with suitable native plant species and Alameda whipsnake habitat.

Oakland's and EBRPD's proposed core scrub habitat removal and shrub thinning (removal of up to 70 percent of shrub cover with the remaining 30 percent of shrub cover retained in 50-foot-diameter shrub islands that are spaced 50 feet apart) will result in a permanent loss of PCE 1 by converting to grassland (PCE 2) in between the shrub islands. Currently, there is no research data available to evaluate what effects the shrub thinning will have on Alameda whipsnakes. The Service believes that in areas where shrubs are thinned the quality of the remaining PCE 1 (the retained shrub islands) will be degraded due to habitat fragmentation resulting in a reduction in the carrying capacity of the core scrub habitat for the Alameda whipsnake. However, there is the potential that the Alameda whipsnake could receive some benefit from the opening up of the shrub canopy resulting in improved foraging, dispersal, and basking habitat for the Alameda whipsnake (PCE 2), especially if suitable rock outcrops (PCE 3) are uncovered. EBRPD will develop, implement, and fund a Service-approved study evaluating the effects of the proposed shrub thinning on the Alameda whipsnake. The study will benefit the Alameda whipsnake in the long-term by providing EBRPD and other habitat managers guidance on how best to manage shrub habitat for the benefit of the Alameda whipsnake. EBRPD will also compensate for the loss of 113.19 acres of PCE 1 within designated critical habitat by purchasing and preserving and managing in perpetuity under a conservation easement at least 386.2 acres of core scrub habitat for the Alameda whipsnake at a Service-approved location within designated critical habitat. Currently, EBRPD is considering purchasing and preserving in perpetuity core scrub habitat within critical habitat Unit 6. The preserved core scrub habitat will provide breeding, feeding, or sheltering commensurate with or better than habitat lost as a result of the effects from the proposed project. The effects of each applicant's proposed and interconnected treatment activities on the designated critical habitat for the Alameda whipsnake are summarized for each applicant in Tables 20, 21, and 22, and below.

UCB: Claremont Canyon, Strawberry Canyon, and Frowning Ridge

Unit 1

UCB initial treatment activities within Unit 1 would be limited to areas unsuitable for Alameda whipsnakes such as eucalyptus and other non-native forests. Therefore, none of the PCEs would be affected during UCB initial treatment activities. UCB treatment activities within Claremont Canyon, Strawberry Canyon, and Frowning Ridge will result in the creation of about 1.66 acres of PCE 1 and the creation of about 5.85 acres of PCE 2 within Alameda whipsnake designated

critical habitat Unit 1 due to the conversion of non-native forest to core scrub and foraging/dispersal habitat (oak woodland and grassland), respectively (Table 20).

Unit 6

UCB initial treatment activities within Unit 6 would be limited to areas unsuitable for Alameda whipsnakes such as eucalyptus and other non-native forests. Therefore, none of the PCEs would be affected during UCB initial treatment activities. UCB treatment activities within Claremont Canyon, Strawberry Canyon, and Frowning Ridge will result in the creation of about 22.40 acres of PCE 1 and the creation of about 118.12 acres of PCE 2 within Alameda whipsnake designated critical habitat Unit 6 due to the conversion of non-native forest to core scrub and foraging/dispersal habitat (oak woodland and grassland), respectively (Table 20).

Summary

UCB non-native forest removal activities will benefit designated critical habitat for the Alameda whipsnake by creating an additional 24.06 acres of PCE 1 and 123.97 acres of PCE 2 within designated critical habitat. The retention of wood chips onsite will not directly affect the PCEs because the wood chips would not be placed within suitable habitat (PCE 1 or PCE 2) for the Alameda whipsnake and would be placed more than 50 feet from rocky outcrops (PCE 3). UCB will minimize the potential for degradation of the PCEs due to the spread of invasive plant species by implementing a Service-approved 10-year monitoring and adaptive management plan with interim and final success criteria to ensure that the treatment areas revegetate with suitable native plant species and PCEs.

Oakland: North Hills-Skyline

Unit 6

Oakland will thin shrubs (removal of up to 70 percent of shrub cover with the remaining 30 percent of shrub cover retained in shrub islands) within Alameda whipsnake core scrub habitat within critical habitat Unit 6 at North-Hills Skyline. This shrub thinning will result in the permanent loss of about 3.75 acres of PCE 1 within Alameda whipsnake designated critical habitat Unit 6 by converting shrublands to grassland (PCE 2) in between the shrub islands. The Service believes that the quality of the remaining PCE 1 (the retained shrub islands) will be degraded due to habitat fragmentation resulting in a reduction in the carrying capacity of the core scrub habitat for the Alameda whipsnake (see the discussion of the effects of shrub thinning above). However, Oakland will create about 8.5 acres of PCE 1 within Alameda whipsnake designated critical habitat Unit 6 by removing at least 90 large Monterey pines and other non-native trees that occur within the shrub matrix and threaten to take over the PCE 1 at North-Hills Skyline. Thus, Oakland's proposed vegetation treatment activities will result in a net increase of 4.75 acres of PCE 1 within designated critical habitat Unit 6 at North-Hills Skyline (Table 21).

Oakland will create an additional 10.09 acres of PCE 2 within Alameda whipsnake designated critical habitat Unit 6 by removing non-native trees and converting to grassland and oak woodland habitat. Oakland will implement a Service-approved 10-year monitoring and adaptive

management plan with interim and final success criteria to ensure that the treatment areas revegetate with suitable native plant species and PCEs. Thus, Oakland activities will result in an increase in the total amount of PCE 2 within designated critical habitat Unit 6 by 13.84 acres (Table 21)

EBRPD: PDM-PJ-09-CA-2006-004, HMGP 1731-16-34, and Interconnected WHRRMP Actions

Unit 1

EBRPD will thin shrubs (removal of up to 70 percent of shrub cover with the remaining 30 percent of shrub cover retained in 50-foot-diameter shrub islands spaced 50 feet apart) within Alameda whipsnake core scrub habitat within critical habitat Unit 1. This shrub thinning will result in the permanent loss of 41.41 acres of PCE 1 within Alameda whipsnake designated critical habitat Unit 1 by converting shrublands to grassland (PCE 2) in between the shrub islands (Table 22). The Service believes that the quality of the remaining PCE 1 (the retained shrub islands) will be degraded due to habitat fragmentation. EBRPD will create an additional 37.81 acres of PCE 2 within Alameda whipsnake designated critical habitat Unit 1 by removing non-native trees and converting to grassland and oak woodland habitat (Table 22). Thus, EBRPD activities will result in an increase in the total amount of PCE 2 within designated critical habitat Unit 1 by 79.22 acres.

Unit 2

EBRPD will thin shrubs (removal of up to 70 percent of shrub cover with the remaining 30 percent of shrub cover retained in 50-foot-diameter shrub islands spaced 50 feet apart) within Alameda whipsnake core scrub habitat within critical habitat Unit 2. This shrub thinning will result in the permanent loss of 9.35 acres of PCE 1 within Alameda whipsnake designated critical habitat Unit 2 by converting shrublands to grassland (PCE 2) in between the shrub islands (Table 22). The Service believes that the quality of the remaining PCE 1 (the retained shrub islands) will be degraded due to habitat fragmentation. EBRPD will create an additional 2.27 acres of PCE 2 within Alameda whipsnake designated critical habitat Unit 2 by removing non-native trees and converting to grassland and oak woodland habitat (Table 22). Thus, EBRPD activities will result in an increase in the total amount of PCE 2 within designated critical habitat Unit 2 by 11.62 acres.

Unit 6

EBRPD will thin shrubs (removal of up to 70 percent of shrub cover with the remaining 30 percent of shrub cover retained in 50-foot-diameter shrub islands spaced 50 feet apart) within Alameda whipsnake core scrub habitat within critical habitat Unit 6. This shrub thinning will result in the permanent loss of 62.43 acres of PCE 1 within Alameda whipsnake designated critical habitat Unit 6 by converting shrublands to grassland (PCE 2) in between the shrub islands (Table 22). The Service believes that the quality of the remaining PCE 1 (the retained shrub islands) will be degraded due to habitat fragmentation. EBRPD will create an additional 23.90 acres of PCE 2 within Alameda whipsnake designated critical habitat Unit 6 by removing non-native trees and converting to grassland and oak woodland habitat (Table 22). Thus,

EBRPD activities will result in an increase in the total amount of PCE 2 within designated critical habitat Unit 6 by 86.40 acres.

Summary

Currently, there is no relevant research data available to determine the overall effects of the proposed shrub thinning and creation of the shrub island mosaic (removal of up to 70 percent of shrub cover with the remaining 30 percent of shrub cover retained in 50-foot-diameter shrub islands spaced 50 feet apart) on the Alameda whipsnake and its habitat. The Service believes that the quality of the remaining PCE 1 (the retained shrub islands) will be degraded due to habitat fragmentation resulting in a reduction in the carrying capacity of the core scrub habitat for the Alameda whipsnake. However, there is the potential that the Alameda whipsnake could benefit from the opening up of the shrub canopy resulting in improved foraging, dispersal, and basking habitat for the Alameda whipsnake (PCE 2), especially if suitable rock outcrops (PCE 3) are uncovered. EBRPD will develop, implement, and fund a Service-approved study evaluating the effects of the proposed shrub thinning on the Alameda whipsnake. The study will benefit the Alameda whipsnake in the long-term by providing EBRPD and other habitat managers guidance on how best to manage shrub habitat for the benefit of the Alameda whipsnake. EBRPD will also implement a Service-approved 10-year monitoring and adaptive management plan with interim and final success criteria to ensure that the treatment areas revegetate with suitable native plant species and PCEs.

EBRPD's proposed project will result in a decrease in the amount of PCE 1 within Alameda whipsnake designated critical habitat by 113.19 acres but an increase in the amount of PCE 2 within designated critical habitat by 177.24 acres (Table 22). EBRPD's proposed non-native forest removal activities will result in an increase in the total acres with one or more PCEs within designated critical habitat by 63.98 acres. EBRPD will compensate for the permanent loss of 113.19 acres of PCE 1 within designated critical habitat by preserving and managing in perpetuity at least 386.2 acres of core scrub habitat (PCE 1) for the Alameda whipsnake at a Service-approved location within designated critical habitat. Currently, EBRPD is proposing to preserve and manage in perpetuity at least 386.2 acres of PCE 1 within an important Alameda whipsnake dispersal corridor within designated critical habitat Unit 6. The Service designated critical habitat within Unit 6 because of its significance as a dispersal corridor for the Alameda whipsnake between Units 1 and 2. Although EBRPD's proposed project will result in a net loss of PCE 1 within designated critical habitat Units 1, 2, and 6, the Service believes that the preservation and management of at least 386.2 acres of PCE 1 at a Service-approved location in Unit 6 will benefit Alameda whipsnake critical habitat by preserving in perpetuity an important dispersal corridor between Units 1 and 2. Maintaining connectivity between Units 1 and 2 allows for dispersal between units for the subspecies and allows for genetic exchange among all three units (Service 2006b). The preserved PCE 1 will provide breeding, feeding, or sheltering commensurate with or better than habitat lost as a result of the effects from the proposed project.

Indirect Effects

Alameda whipsnake critical habitat could be degraded if the proposed and interconnected project activities resulted in an increase in invasive plant species within suitable habitat for the Alameda

whipsnake. The applicants will minimize the spread of invasive plant species by implementing a Service-approved 10-year monitoring and adaptive management plan with interim and final success criteria to ensure that treatment areas revegetate with suitable native plant species and PCEs. The complete removal of eucalyptus and other non-native trees on UCB and Oakland parcels would indirectly benefit Alameda whipsnake critical habitat by removing a continued seed source for encroachment of eucalyptus and non-native trees into Alameda whipsnake habitat. Thinning of eucalyptus by EBRPD may provide some minimal benefit to Alameda whipsnake critical habitat in the short-term; however, the remaining eucalyptus trees in the area would continue as a seed source and would likely encroach upon Alameda whipsnake critical habitat unless continuously maintained by herbicides and logging.

Pallid Manzanita

Direct and Indirect Effects

EBRPD's implementation of the proposed and interconnected WHRRMP actions may have temporary adverse effects on pallid manzanitas in the action area from direct disturbance to plants (*e.g.*, trampling, removal, or direct contact with heavy machinery) and alteration of 1.3 acres of suitable occupied habitat. Individual pallid manzanita plants could be injured or killed or if they were exposed to herbicides during treatment activities. Pallid manzanita plants could be indirectly affected by the introduction and spread of the fungal pathogen *P. cinnamomi* into existing stands. The introduction and spread of *P. cinnamomi* could extirpate whole stands of the pallid manzanita within the action area.

EBRPD will minimize the level of disturbance of pallid manzanitas, the potential for exposure to herbicides, and the potential for the introduction and spread of *P. cinnamomi* by implementing the BMPs and avoidance and minimization measures in the *Conservation Measures* section of the biological opinion including: (1) having a Service-approved biologist train all project staff, flag all pallid manzanita shrubs and seedlings for avoidance, and supervise all activities near pallid manzanita plants; (2) avoiding areal application of herbicides within 300 feet of pallid manzanita plants; (3) avoiding the removal of any living pallid manzanitas (as identified by the Service-approved biologist); (4) prohibiting goat grazing within treatment areas containing pallid manzanitas; (5) implementing measures to minimize the potential for the introduction and spread of *P. cinnamomi*; and(6) removing shrubs and trees that are not a component of the maritime chaparral vegetation type that are excessively shading pallid manzanita plants. Hand labor would be used in areas of pallid manzanita to limit ground disturbance, pile burning would only be conducted in areas where pallid manzanita plants or seeds do not occur, and several other protection measures would be implemented, as described in the *Conservation Measures* and above, to minimize effects to pallid manzanita. Trees and other plants around pallid manzanita plants would be pruned to allow pallid manzanita plants to grow unimpeded.

EBRPD will also minimize the potential for the introduction and spread of invasive plant species by monitoring all vegetation treatment areas and implementing a Service-approved MMP. The vegetation management goals of EBRPD, including the removal of invasive plant species, would enhance the existing suitable habitat for pallid manzanita. In addition, it is likely that viable pallid manzanita seed banks exist within the action area, and the proposed treatment activities

may stimulate the germination of pallid manzanita seedlings. Herbicide application associated with the proposed and interconnected actions is unlikely to affect the pallid manzanita because herbicides within 300 feet of pallid manzanitas would be applied through direct application to the stumps of exotic and invasive species only. Foliar application of herbicides or other spray application methods would be prohibited within 300 feet of pallid manzanitas.

In addition to the general BMPs described in the *Conservation Measures*, species specific avoidance measures would be taken to protect pallid manzanitas. The potential for introduction and spread of the fungal pathogen *P. cinnamomi* into existing stands of pallid manzanita would be minimized by implementing BMPs and measures specific to preventing the spread of plant pathogens (*e.g.*, equipment and vehicle washings before and after vegetation management within areas of known pallid manzanita; restricting wet season activities; and having a Service-approved biologist onsite), as described above and in the *Conservation Measures*.

EBRPD will also minimize the effects of the proposed project on the pallid manzanita by implementing a Service-approved long-term adaptive management plan for all pallid manzanita stands that occur on EBRPD lands, not just those areas supporting pallid manzanita that lie within the action area for the WHRRMP and the wildland-urban interface (Draft EBRPD Pallid Manzanita Management Plan, ESA 2013). Since nearly 75 percent of the total range-wide population of the pallid manzanita occurs on EBRPD lands, the implementation of the long-term EBRPD Pallid Manzanita Management Plan will significantly contribute to the management, restoration, and recovery of the pallid manzanita. The EBRPD Pallid Manzanita Management Plan will utilize existing sources of information, management strategies, and proposals. These include the Alameda Manzanita Management Plan (Amme and Havlik 1987), the Chabot Pallid Manzanita Habitat Enhancement and Conservation Plan, the EBRPD WHRRMP (LSA Associates, Inc. 2009), Global Position System data, and Geographic Information Systems layers already developed by EBRPD.

The goals of the Draft EBRPD Pallid Manzanita Management Plan (ESA 2013) include: (1) managing and expanding existing pallid manzanita stands in such a way as to maximize individual plant health, maintain species genetic integrity and diversity, and promote stand regeneration in perpetuity; (2) establishing or restoring additional pallid manzanita stands in areas that are not subject to fuel management or other incompatible uses; and (3) controlling the spread of the fungal pathogen, *P. cinnamomi*, within and between pallid manzanita stands.

EBRPD proposes to achieve these goals by implementing the following general recommendations including: (1) updating and monitoring the status of pallid manzanita populations; (2) seed banking for all naturally occurring populations of pallid manzanita, focusing on representative genetic diversity; (3) recreational user and neighborhood education and outreach to minimize the spread of *P. cinnamomi*; (4) removing non-native vegetation and other vegetation that threaten to outcompete the pallid manzanita; (5) conducting studies and implementing measures to enhance germination of pallid manzanitas; (6) outplanting of propagated pallid manzanita plants and/or direct seeding; (7) conducting prescribed fire; and (8) controlling *P. cinnamomi* (ESA 2013). Additionally, EBRPD is proposing in the Draft EBRPD Pallid Manzanita Management Plan to minimize the potential for the introduction and spread of *P. cinnamomi* by educating trail users and adjacent homeowners; establishing wash stations at

trailheads; and decommission trails or seasonally closing trails through pallid manzanita stands. The EBRPD Pallid Manzanita Management Plan will be finalized and approved by the Service prior to EBRPD conducting any vegetation management activities within areas containing pallid manzanita (ESA 2013).

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 FEMA East Bay Hills Hazardous Fire Risk Reduction Project are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

A list of upcoming State and private projects in the action area that are reasonably certain to occur and that may contribute to cumulative effects on the California red-legged frog, Alameda whipsnake, Alameda whipsnake critical habitat, and pallid manzanita was acquired by FEMA. Several of the projects (Anthony Chabot and Tilden projects) would involve work in areas that are already developed and would be unlikely to have significant effects on habitat for the California red-legged frog, Alameda whipsnake, Alameda whipsnake critical habitat, and pallid manzanita. Projects at UCB and Claremont Canyon are not well defined with respect to their locations at this time, and they could have the potential to affect habitat for the California red-legged frog and Alameda whipsnake. However, potential UCB building expansion within habitat for the California red-legged frog and Alameda whipsnake (*e.g.*, the 100,000 square-foot expansion of existing facilities in the UCB Hill Campus Program Space Addition) would be highly constrained by the steep slopes that are present within the action area and would likely be limited to modest expansion of existing structures located in developed/disturbed areas that do not provide suitable habitat for listed species (FEMA 2012). A new staging area for access to Claremont Canyon could have the potential to affect habitat for the California red-legged frog and Alameda whipsnake, although it would represent a small area and would be located close to existing roads and infrastructure (FEMA 2012). Thus there would be no significant cumulative effects when other projects are considered. In addition, the projects listed above would be subject to State environmental compliance and permits and would be required to implement similar avoidance measures and BMPs to avoid or minimize impacts.

California Public Resources Code 4291

In January 2005, a new California state law (California Public Resources Code Section 4291) became effective that extended the defensible space clearance around homes and structures from 30 feet to 100 feet with the purpose of increasing the chances of a structure surviving a wildfire. Since nearly all pallid manzanita shrubs in one of the two major populations of pallid manzanita occur within the wildland-urban interface, compliance with California Public Resources Section 4291, on the part of EBRPD and private property owners combined, poses a significant threat to the species (ESA 2013). Over 40 percent of the Huckleberry Ridge pallid manzanita population occurs on private property; many of these are within the 100 foot defensible clearance space, and therefore, are threatened with removal by homeowners in the area complying with the law (ESA

2013). The removal of core scrub habitat by local and private property owners around homes and structures also threatens the Alameda whipsnake and its designated critical habitat.

Climate Change

The global average temperature has risen by approximately 0.6 degrees Centigrade during the 20th Century (International Panel on Climate Change [IPCC] 2001, 2007a, 2007b; Adger *et al.* 2007). There is an international scientific consensus that most of the warming observed has been caused by human activities (IPCC 2001, 2007a, 2007b; Adger *et al.* 2007), and that it is "very likely" that it is largely due to man-made emissions of carbon dioxide and other greenhouse gases (Adger *et al.* 2007). Ongoing climate change (Inkley *et al.* 2004; Adger *et al.* 2007; Kanter 2007) likely imperils the California red-legged frog, Alameda whipsnake, Alameda whipsnake critical habitat, and pallid manzanita and the resources necessary for their survival, since climate change threatens to disrupt annual weather patterns, it may result in a loss of their habitats and/or prey, and/or increased numbers of their predators, parasites, diseases, and non-native competitors. Where populations are isolated, a changing climate may result in local extinction, with range shifts precluded by lack of habitat.

Conclusion

After reviewing the current status of the California red-legged frog, 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 proposed FEMA East Bay Hills Hazardous Fire Risk Reduction Project, as described herein, is not likely to jeopardize the continued existence of this listed species. We base this conclusion on the following: (1) the implementation of the avoidance and minimization measures as described in the *Description of the Proposed Project* of this biological opinion would minimize the potential for injury and mortality of the California red-legged frog; (2) no suitable breeding habitat for the California red-legged frog would be disturbed; (3) the implementation of a stormwater pollution prevention plan, spill prevention plan, and BMPs for herbicide use would minimize the potential for injury to California red-legged frogs and degradation of aquatic habitat; and (4) the removal of non-native eucalyptus and conversion to native plant species would improve the quality of aquatic habitat and abundance of invertebrate prey for the California red-legged frog.

After reviewing the current status of the Alameda whipsnake, 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 proposed FEMA East Bay Hills Hazardous Fire Risk Reduction Project, as described herein, is not likely to jeopardize the continued existence of this listed species. We base this conclusion on the following: (1) the implementation of the avoidance and minimization measures as described in the *Description of the Proposed Project* of this biological opinion will minimize the potential for injury and mortality of the Alameda whipsnake; (2) UCB's non-native forest, acacia, and French broom removal activities will create 167.9 acres of suitable habitat for the Alameda whipsnake consisting of at least 32.9 acres of core scrub habitat; (3) Oakland's non-native forest, acacia, and French broom removal will create 40.8 acres of suitable habitat for the Alameda whipsnake consisting of at least 18.2 acres of core scrub habitat; (4) EBRPD will purchase, preserve, and manage in perpetuity under a conservation easement

with a long-term endowment at least 386.2 acres of core scrub habitat for the Alameda whipsnake at a Service-approved location; and (5) the applicants will ensure the treatment areas revegetate with suitable native plant species and habitat for the Alameda whipsnake by implementing a Service-approved 10-year monitoring and adaptive management plan with interim and final success criteria.

After reviewing the current status of Alameda whipsnake critical habitat, 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 proposed FEMA East Bay Hills Hazardous Fire Risk Reduction Project, as described herein, is not likely to result in the destruction or adverse modification of Alameda whipsnake critical habitat. We base this conclusion on the following: (1) UCB's non-native forest, acacia, and French broom removal activities will benefit designated critical habitat for the Alameda whipsnake by creating an additional 24.06 acres of PCE 1 and 123.97 acres of PCE 2 within designated critical habitat; (2) Oakland's non-native forest, acacia, and French broom removal activities will increase the total acres containing PCEs within designated critical habitat by about18.59 acres including a net increase of 4.75 acres of PCE 1; (3) EBRPD will purchase, preserve, and manage in perpetuity under a conservation easement with a long-term endowment at least 386.2 acres of PCE 1 for the Alameda whipsnake at a Service-approved location within designated critical habitat; and (4) the applicants will ensure the treatment areas revegetate with suitable native plant species and PCEs by implementing a Service-approved 10-year monitoring and adaptive management plan with interim and final success criteria.

After reviewing the current status of the pallid manzanita, 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 proposed FEMA East Bay Hills Hazardous Fire Risk Reduction Project, as described herein, is not likely to jeopardize the continued existence of this listed species. We base this conclusion on the following: (1) the implementation of the avoidance and minimization measures and BMPs as described in the *Description of the Proposed Project* of this biological opinion will minimize the potential for disturbance of the pallid manzanita, the potential for its exposure to herbicides, and the potential for the spread of the fungal pathogen *P. cinnamomi*; (2) EBRPD will ensure the treatment areas revegetate with suitable native plant species by implementing a Service-approved 10-year monitoring and adaptive management plan with interim and final success criteria; and (3) EBRPD will develop and implement a Service-approved long-term adaptive management plan for all pallid manzanita populations that occur on EBRPD lands (nearly 75 percent of the total range-wide population of the pallid manzanita) which will contribute to the recovery of the pallid manzanita.

The conservation measures for the proposed project have been designed so that each applicant is responsible for the successful implementation of their own avoidance, minimization, restoration, and compensation measures and thus not dependent on the restoration and compensation being implemented by the other applicants. Therefore, any changes to the proposed project being implemented by one of the applicants would require reinitiation of formal consultation only on that applicant's portions of the proposed project and thus would not delay the implementation of the proposed project by the other applicants.

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 significantly impairing essential 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 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 the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by FEMA so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply. FEMA has a continuing duty to regulate the activity covered by this incidental take statement. If FEMA (1) fails to assume and implement the terms and conditions or (2) 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, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, UCB, Oakland, and EBRPD must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, limited protection of listed plants from take is provided to the extent that the Act prohibits the removal or reducing to possession of federally listed plants from areas under Federal jurisdiction; the malicious damage or destruction of any such species on such areas; and the removal, destruction or damage of such species in violation of state laws, including state criminal trespass law (16 USC 1538(a)(2)(B)).

Amount or Extent of Take

California Red-Legged Frog

The Service anticipates that incidental take of the California red-legged frog will be difficult to detect for the following reasons: their relatively small body size makes the finding of a dead specimen unlikely; the cryptic nature of the species; losses may be masked by seasonal fluctuations in numbers or other causes; and the species occurs in aquatic, riparian and upland habitats that makes it difficult to detect. Due to the difficulty in quantifying the number of California red-legged frogs that will be taken as a result of the proposed project, the Service is quantifying take incidental to the proposed project as the following for each of the applicants:

1. UCB: Claremont Canyon, Frowning Ridge, and Strawberry Canyon

    a. The harassment of all juvenile, subadult, and adult life history stages of the California red-legged frog within 93.7 acres of suitable non-breeding habitat disturbed during initial implementation of the proposed project by UCB at Claremont Canyon and Frowning Ridge.

    b. The harassment of all juvenile, subadult, and adult life history stages of the California red-legged frog within 93.7 acres of suitable non-breeding habitat during follow-up maintenance activities conducted by UCB over a 10-year period at Frowning Ridge.

    c. The injury or mortality of all juvenile, subadult, and adult life history stages of the California red-legged frog within 54.7 acres of suitable non-breeding habitat disturbed during high-impact activities (e.g., major ground disturbance and use of heavy equipment) by UCB at Claremont Canyon and Frowning Ridge.

    d. The injury or mortality of one (1) individual juvenile, subadult, or adult California red-legged frog in UCB project areas outside of the high-impact activity areas.

    e. The capture of all California red-legged frogs within the 285-acre action area for UCB's proposed project at Claremont Canyon, Frowning Ridge, and Strawberry Canyon.

2. Oakland: North Hills-Skyline and Caldecott Tunnel

    a. The harassment, injury, or mortality of one (1) individual juvenile, subadult, or adult California red-legged frog in Oakland's project areas at North Hills-Skyline and Caldecott Tunnel.

    b. The capture of all California red-legged frogs within the 122-acre action area in Oakland's project areas at North Hills-Skyline and Caldecott Tunnel.

3. EBRPD: PDM-PJ-09-CA-2006-004, HMGP 1731-16-34, and Interconnected WHRRMP Actions

    a. The harassment of all juvenile, subadult, and adult life history stages of the California red-legged frog within 588.3 acres of suitable habitat disturbed during initial implementation of the proposed and interconnected projects by EBRPD.

    b. The harassment of all juvenile, subadult, and adult life history stages of the California red-legged frog within 588.3 acres of suitable habitat during follow-up maintenance activities conducted by EBRPD over a 10-year period.

    c. The injury or mortality of one (1) individual juvenile, subadult, or adult California red-legged frog in EBRPD project areas.

d. The capture of all California red-legged frogs within the 2,466-acre action area for EBRPD's proposed and interconnected project areas.

Alameda Whipsnake

The Service anticipates that incidental take of the Alameda whipsnake will be difficult to detect for the following reasons: the cryptic nature and behavior of the species; losses may be masked by seasonal fluctuations in numbers or other causes. Due to the difficulty in quantifying the number of Alameda whipsnakes that will be taken as a result of the proposed project, the Service is quantifying take incidental to the proposed project as the following:

1. UCB: Claremont Canyon, Strawberry Canyon, and Frowning Ridge

    a. The harassment, injury, or mortality of all Alameda whipsnakes within 0.3 acre disturbed during high-impact activities (e.g., major ground disturbance and use of heavy equipment) during initial implementation of the proposed project by UCB at Claremont Canyon and Frowning Ridge.

    b. The harassment of all Alameda whipsnakes within 263.8 acres of suitable habitat during follow-up maintenance activities conducted by UCB over a 10-year period at Claremont Canyon, Strawberry Canyon, and Frowning Ridge.

    c. The injury or mortality of one (1) individual Alameda whipsnake outside of the high-impact activity areas at Claremont Canyon, Strawberry Canyon, and Frowning Ridge.

    d. The capture of all Alameda whipsnakes within the 285-acre action area for UCB's proposed project at Claremont Canyon, Strawberry Canyon, and Frowning Ridge.

2. Oakland: North Hills-Skyline and Caldecott Tunnel

    a. The harassment of all Alameda whipsnakes within 13.6 acres of suitable habitat disturbed during initial implementation of the proposed project by Oakland at North Hills-Skyline and Caldecott Tunnel.

    b. The harassment of all Alameda whipsnakes within 107.0 acres of suitable habitat during follow-up maintenance activities conducted by Oakland over a 10-year period North Hills-Skyline and Caldecott Tunnel.

    c. The injury or mortality of all Alameda whipsnakes within 0.6 acre of suitable habitat disturbed during high-impact activities (e.g., major ground disturbance and use of heavy equipment) by Oakland at North Hills-Skyline and Caldecott Tunnel.

    d. The injury or mortality of one (1) individual Alameda whipsnake outside of the high-impact activity areas at North Hills-Skyline and Caldecott Tunnel.

e. The harm of all Alameda whipsnakes within 3.8 acres of core scrub habitat permanently lost and converted to foraging/dispersal habitat due to shrub thinning conducted by Oakland at North Hills-Skyline.

f. The capture of all Alameda whipsnakes within the 122-acre action area for Oakland's proposed project at North Hills-Skyline and Caldecott Tunnel.

4. EBRPD: PDM-PJ-09-CA-2006-004, HMGP 1731-16-34, and Interconnected WHRRMP Actions

a. The harassment of all Alameda whipsnakes within 520.0 acres of suitable habitat disturbed during initial implementation of the proposed and interconnected actions by EBRPD.

b. The harassment of all Alameda whipsnakes within 1,058.6 acres of suitable habitat during follow-up maintenance activities conducted by EBRPD over a 10-year period.

c. The injury or mortality of all Alameda whipsnakes within 196.5 acres of suitable habitat disturbed during high-impact activities (*e.g.*, major ground disturbance and use of heavy equipment) within EBRPD's proposed and interconnected project areas.

d. The injury or mortality of one (1) individual Alameda whipsnake outside of EBRPD high-impact activity areas.

e. The harm of all Alameda whipsnakes within 193.1 acres of core scrub habitat permanently lost and converted to foraging/dispersal habitat due to shrub thinning conducted within EBRPD's proposed and interconnected project areas.

f. The capture of all Alameda whipsnakes within the 2,466-acre action area for EBRPD's proposed and interconnected project areas.

Effect of the Take

In the accompanying biological opinion, the Service determined that the level of anticipated take is not likely to result in jeopardy to the California red-legged frog and Alameda whipsnake.

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 California red-legged frog, Alameda whipsnake, and pallid manzanita:

1. FEMA through the applicants will implement the BMPs and Conservation Measures in the *Description of the Proposed Project* in this biological opinion.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, FEMA must ensure compliance with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are non-discretionary.

1. The following Terms and Conditions implement Reasonable and Prudent Measure Number One (1):

   a. FEMA shall ensure that each applicant has a final Service-approved 10-year MMP prior to their initiation of the proposed project. The MMPs shall include interim and final success criteria for the cover of native and invasive plant species, the cover of suitable listed species habitat, and the decomposition of wood chips within all proposed treatment areas. FEMA shall ensure that the applicants develop and implement Service-approved contingency plans in case the interim and final success criteria are not achieved.

   b. FEMA shall ensure that UCB creates at least 167 acres of suitable habitat for the Alameda whipsnake consisting of at least 32 acres of core scrub habitat.

   c. FEMA shall ensure that Oakland creates at least 40 acres of suitable habitat for the Alameda whipsnake consisting of at least 18 acres of core scrub habitat.

   d. FEMA shall ensure that EBRPD creates at least 62 acres of suitable habitat for the Alameda whipsnake.

   e. FEMA shall ensure that EBRPD has a compensation plan finalized and approved by the Service for the purchase, preservation, and management in perpetuity of at least 386.2 acres of core scrub habitat for the Alameda whipsnake at a Service-approved location within its designated critical habitat prior to EBRPD initiating any vegetation management activities within Alameda whipsnake habitat. FEMA shall ensure that the conservation easement is recorded by EBRPD within nine months of EBRPD initiating the proposed project. FEMA shall ensure that the long-term endowment funding for the compensation areas will be in place within nine months of EBRPD initiating the proposed project. The endowment will be Service-approved and will provide funding for management of these areas in perpetuity.

   f. FEMA shall ensure that EBRPD develops and initiates a Service-approved study analyzing the effects of the proposed shrub thinning on the Alameda whipsnake prior to the initiation of any vegetation management activities within Alameda whipsnake habitat.

   g. FEMA shall ensure that EBRPD has a final Service-approved long-term management plan for all stands of the pallid manzanita that occur on EBRPD lands prior to the initiation of any vegetation management activities within areas that contain the pallid manzanita.

Reporting Requirements

The Service must be notified within 24 hours of the finding of any injured or dead California red-legged frog or Alameda whipsnake. Injured California red-legged frogs and Alameda whipsnakes shall be cared by a licensed veterinarian or other qualified person, such as the Service-approved biologist for the proposed action. Notification must include the date, time, and precise location of the specimen/incident, and any other pertinent information. Dead animals should be sealed in a zip lock bag containing a piece of paper indicating the location, date and time when it was found, and the name of the person who found it; and the bag should be frozen in a freezer in a secure location. The Service contact persons are Coast Bay/Forest Foothills Division Chief, Endangered Species Program, at the Sacramento Fish and Wildlife Office at telephone (916) 414-6600 and Resident Agent-in-Charge of the Service's Law Enforcement Division at telephone (916) 569-8444.

The applicant shall submit a post-construction compliance report prepared by the onsite biologist to the Sacramento Fish and Wildlife Office within sixty (60) calendar days of the date of the completion of construction activity. This report shall detail (i) dates that construction occurred; (ii) pertinent information concerning the success of the project in meeting the avoidance and minimization measures; (iii) an explanation of failure to meet such measures, if any; (iv) known project effects on the California red-legged frog and Alameda whipsnake, if any; (v) occurrences of incidental take of these listed species, if any; (vi) documentation of employee environmental education; and (vii) other pertinent information.

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 databases.

1. FEMA, UCB, Oakland, and EBRPD should incorporate in their projects the creation of suitable aquatic breeding habitat for the California red-legged frog while eradicating non-native species such as bullfrogs, non-native fish, and non-native tiger salamanders that threaten this listed species.

2. FEMA, UCB, Oakland, and EBRPD should promote the eradication of non-native eucalyptus, Monterey pine, Monterey cypress, and French broom within and near suitable habitat for the Alameda whipsnake and Presidio clarkia.

3. FEMA, UCB, Oakland, and EBRPD should encourage or require the use of appropriate California native species in revegetation and habitat enhancement efforts.

4. FEMA, UCB, Oakland, and EBRPD should avoid the use of rodenticides in suitable habitat for the California red-legged frog and Alameda whipsnake and other listed species that rely on small mammals for creating burrows or as a prey source.

5. FEMA, UCB, Oakland, and EBRPD should manage scrub, grassland, and oak woodland habitats for the benefit of the Alameda whipsnake. EBRPD should re-route trails away from suitable Alameda whipsnake and pallid manzanita habitat.

6. FEMA and Oakland should develop and implement a Service-approved long-term management plan for the pallid manzanita similar to the one being developed by EBRPD.

7. EBRPD should acquire, preserve, and manage lands containing the pallid manzanita that are currently unprotected on private lands. EBRPD should educate and work with adjacent landowners to minimize the potential for the introduction and spread of *P. cinnamomi* into areas containing the pallid manzanita.

8. FEMA and Oakland should persuade private landowners in the Oakland Hills (e.g., Oakland Hills Tennis Club, Sunrise Assisted Living Facility, and the proposed Crestmont development) to monitor the Presidio clarkia subpopulations on their lands and control invasive species as required under their management plans that were developed during the California Environmental Quality Act process (*e.g.*, Center for Biological Diversity 2007; Kanz *in litt.* 2009; EBRPD 2009; Oakland 2006).

9. FEMA and Oakland should increase education of Oakland road maintenance and vegetation and fire management teams in how to avoid and minimize impacts to the Presidio clarkia including delaying their activities (*e.g.*, mowing and weed-whacking) in areas with Presidio clarkia (Chadbourne Way, Old Redwood Road, and Redwood Regional Park subpopulations) until after the Presidio clarkia have set seed (late summer, early fall). The Center for Biological Diversity, California Native Plant Society, and local residents have documented on multiple occasions in recent years vegetation management activities conducted by Oakland in the Crestmont neighborhood that resulted in the disturbance of Presidio clarkia plants within the Chadbourne Way, Kimberlin Heights Drive, Colgett Drive, Crestmont Drive, and Old Redwood Road subpopulations before the plants had released and dispersed their seeds (Kanz *in litt.* 2006; Augustine *in litt.* 2006; Baker *in litt.* 2009; Baker, pers. comm. 2009; Kanz, pers. comm. 2009; Naumovich, pers. comm. 2009).

10. FEMA and Oakland should persuade private landowners in the Oakland Hills (*e.g.*, Colgett Drive, Kimberlin Heights Drive, and Crestmont Drive) to remove trees where they have been planted in suitable Presidio clarkia habitat as is being done at Redwood Regional Park and the San Francisco Presidio.

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

REINITIATION—CLOSING STATEMENT

This concludes formal consultation on the proposed FEMA Hazardous Fire Risk Reduction Project in the East Bay Hills of Alameda and Contra Costa Counties, California. As provided in

50 CFR 402.16, reinitiating 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: (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 biological 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 immediately cease, pending reinitiating.

If you have any questions regarding this biological opinion on the FEMA Hazardous Fire Risk Reduction Project in the East Bay Hills, please contact Joseph Terry, Senior Biologist, or Ryan Olah, Coast Bay/Forest Foothills Division Chief, at the letterhead address, electronic mail (Joseph_Terry@fws.gov; Ryan_Olah@fws.gov), or at telephone (916) 414-6600.

Sincerely,

Jan C. Knight
Acting Field Supervisor

Enclosure

cc:
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Darren Howe, National Marine Fisheries Service, Santa Rosa, California

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Appendix A: Maps of the FEMA Hazardous Fire Risk Reduction Project Treatment Areas

Enclosure: Maps of treatment areas

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Appendix A: Maps of FEMA Hazardous Fire Risk Reduction Project Treatment Areas in the East Bay Hills, Contra Costa and Alameda Counties, California
(Figures copied from FEMA (2012))

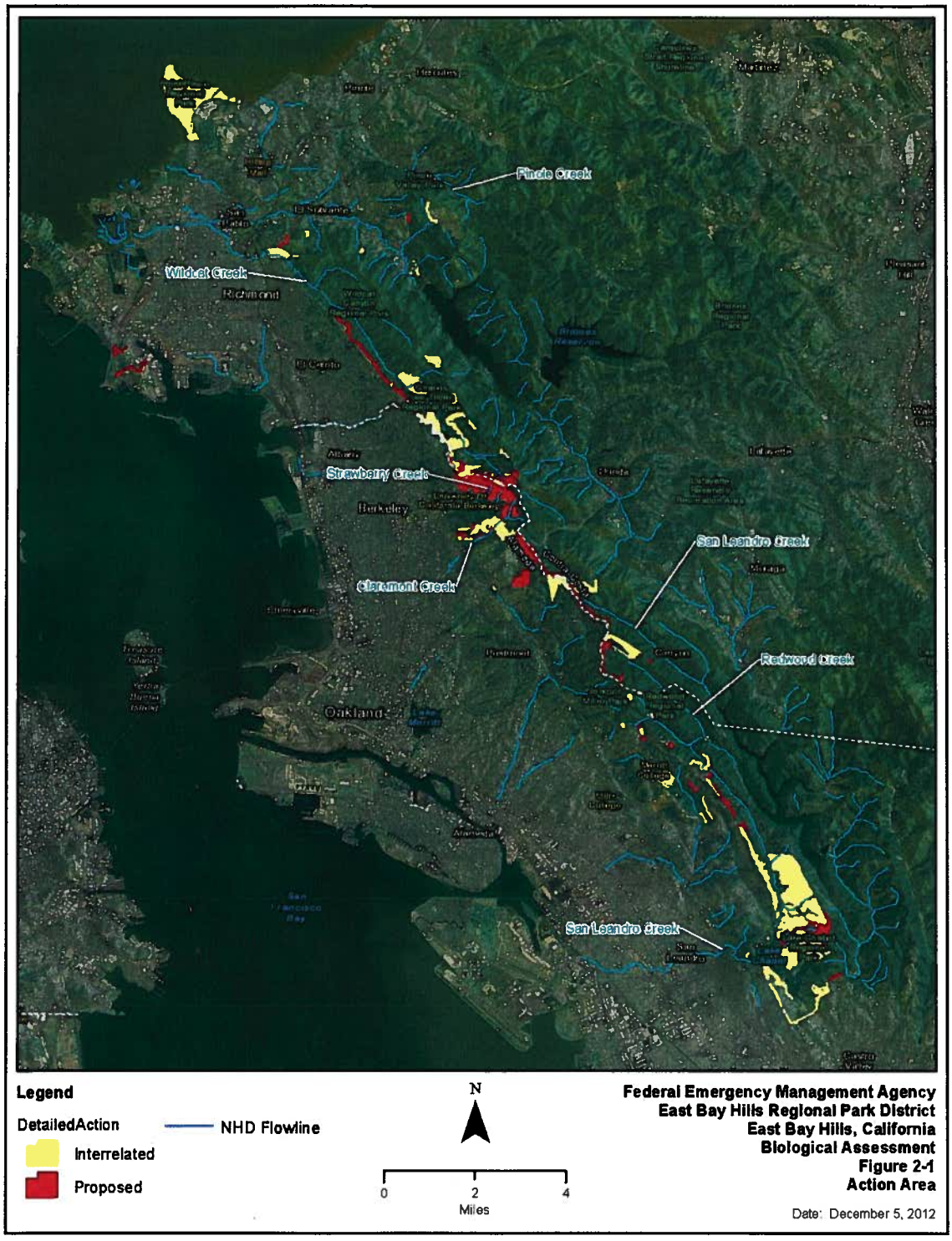

Figure 1. Action Area for the FEMA Hazardous Fire Risk Reduction Project in the East Bay Hills.

Figure 2A. California Red-Legged Frog Suitable Habitat in the Action Area.

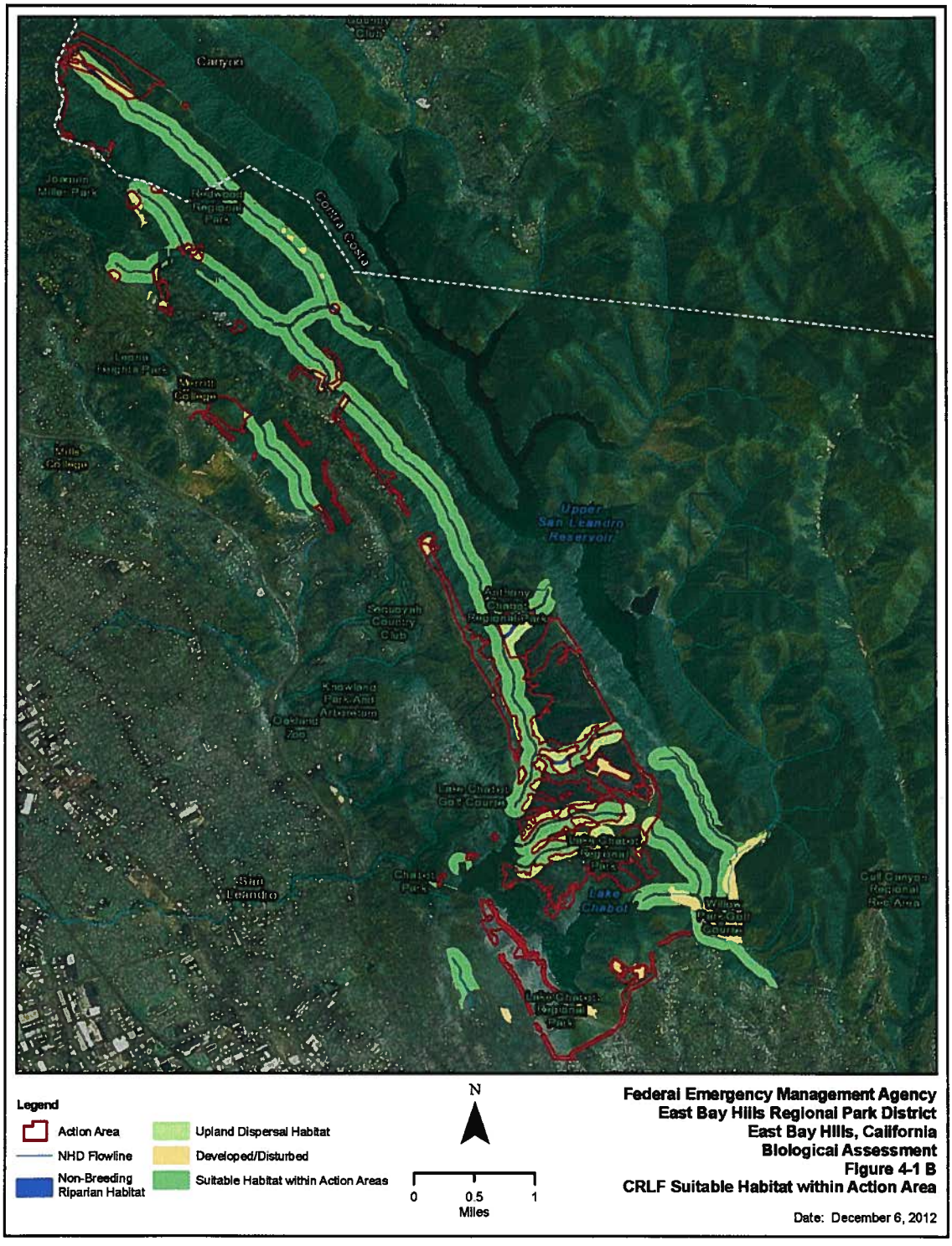

Figure 2B. California Red-Legged Frog Suitable Habitat in the Action Area.

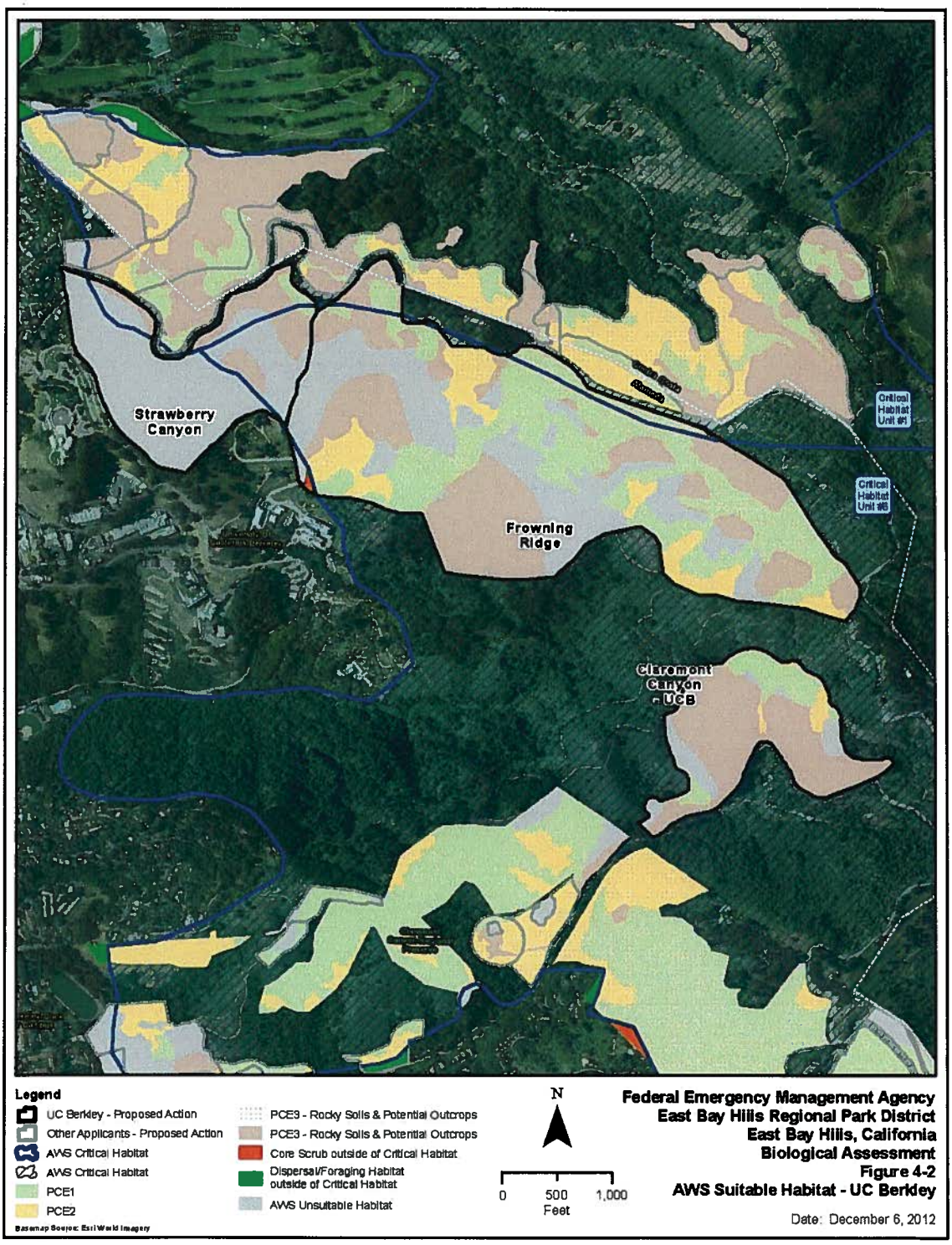

Figure 3. Alameda Whipsnake Suitable Habitat and PCEs (UCB).

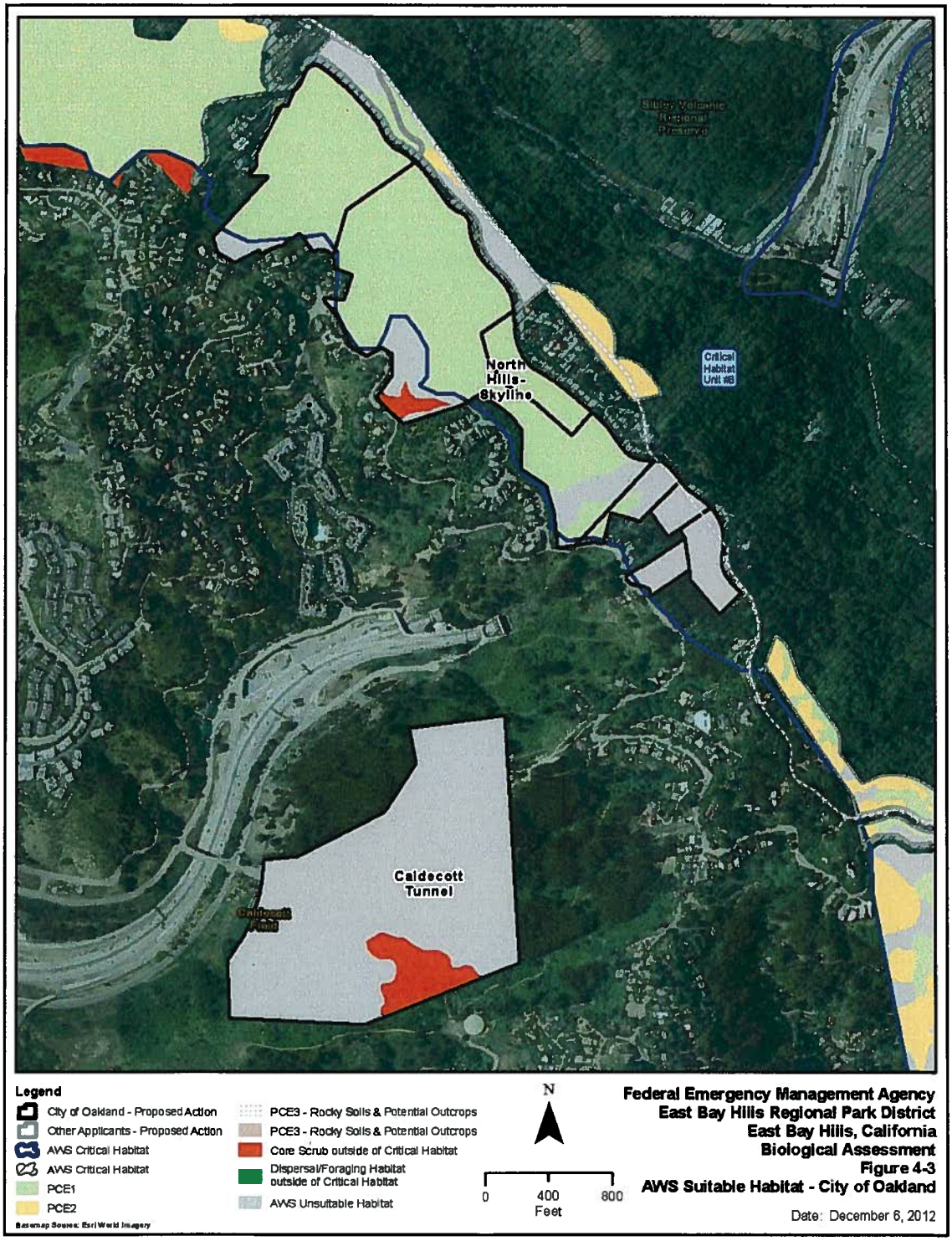

Figure 4. Alameda Whipsnake Suitable Habitat and PCEs (Oakland).

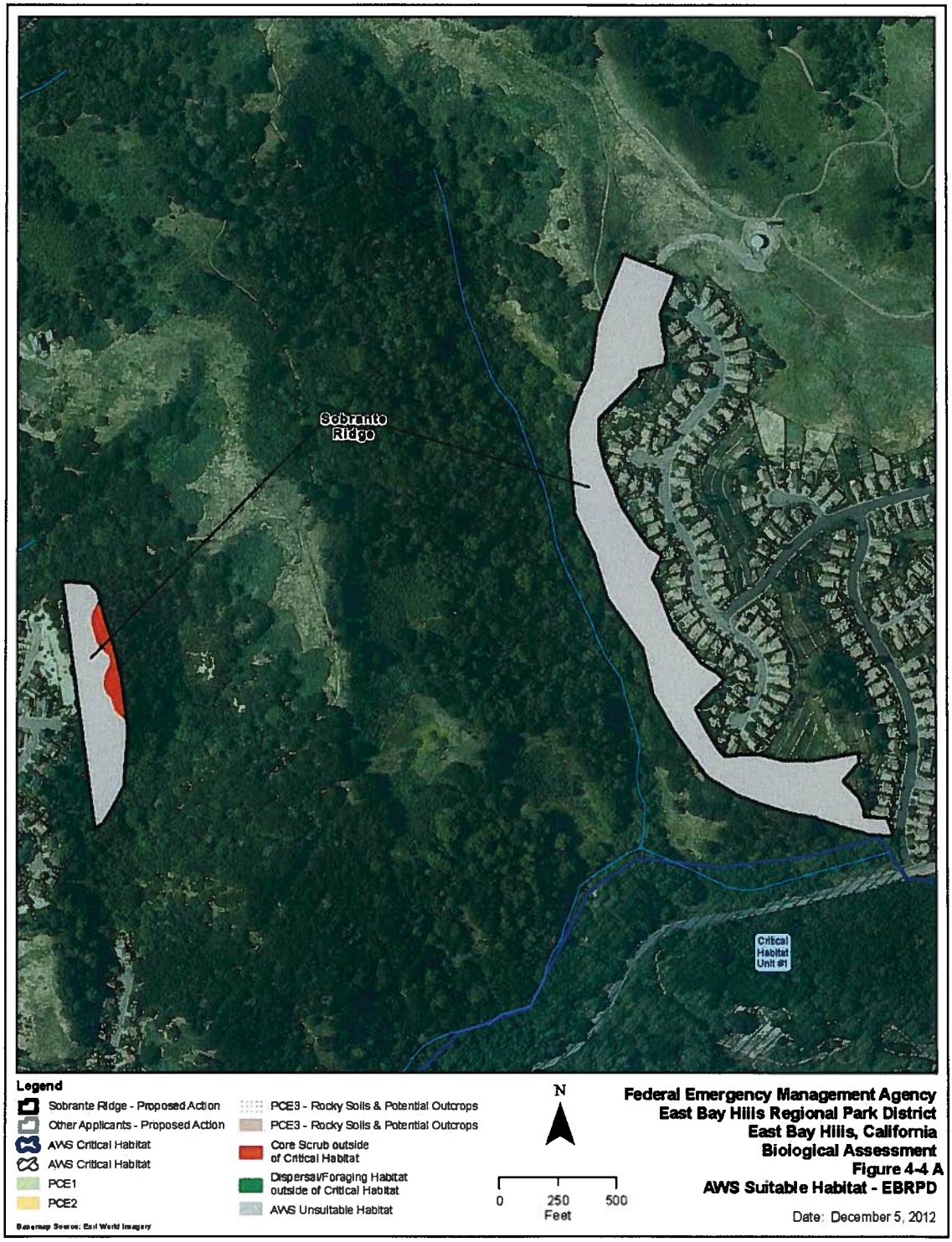

Figure 5A. Alameda Whipsnake Suitable Habitat and PCEs (EBRPD Map 1).

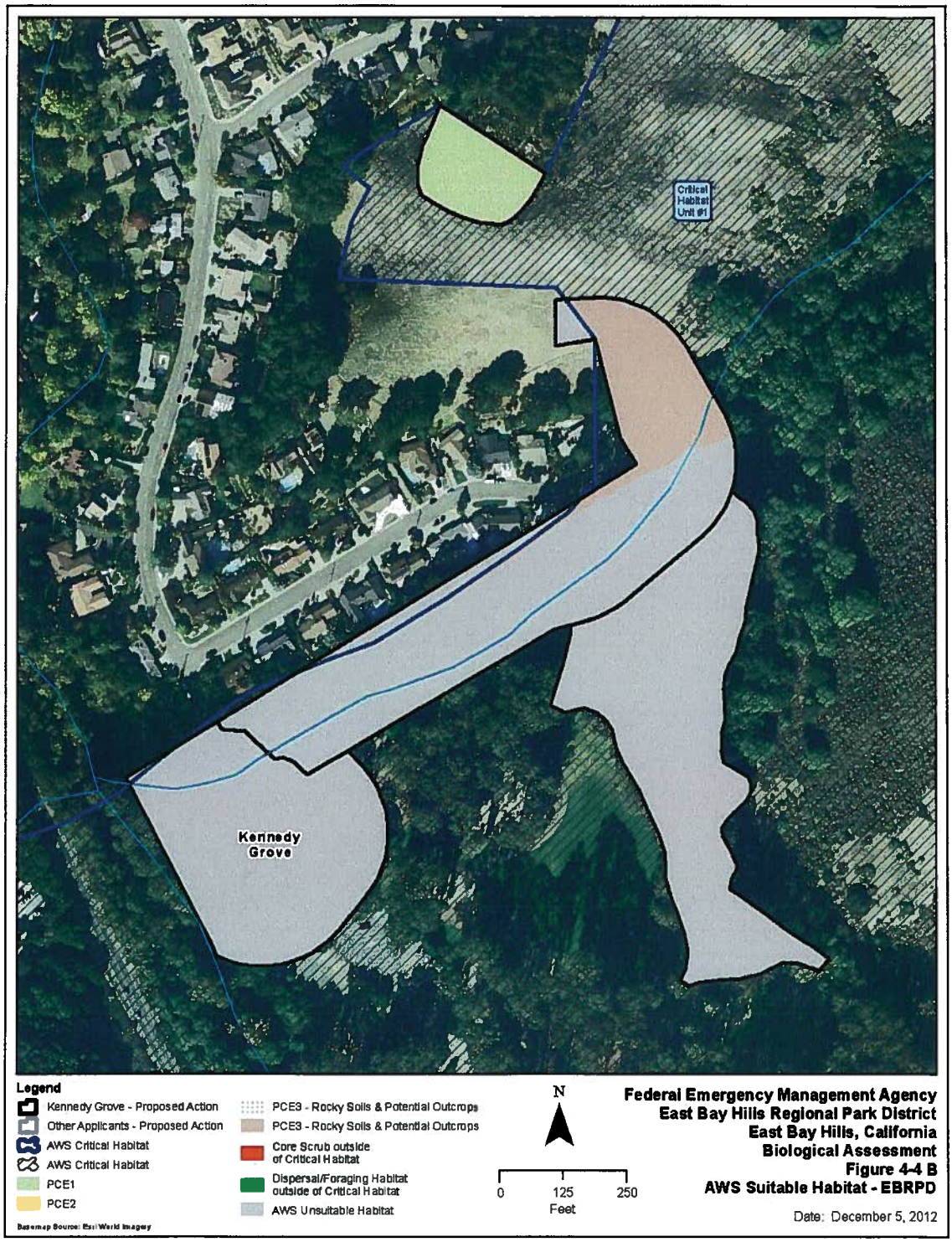

Figure 5B. Alameda Whipsnake Suitable Habitat and PCEs (EBRPD Map 2).

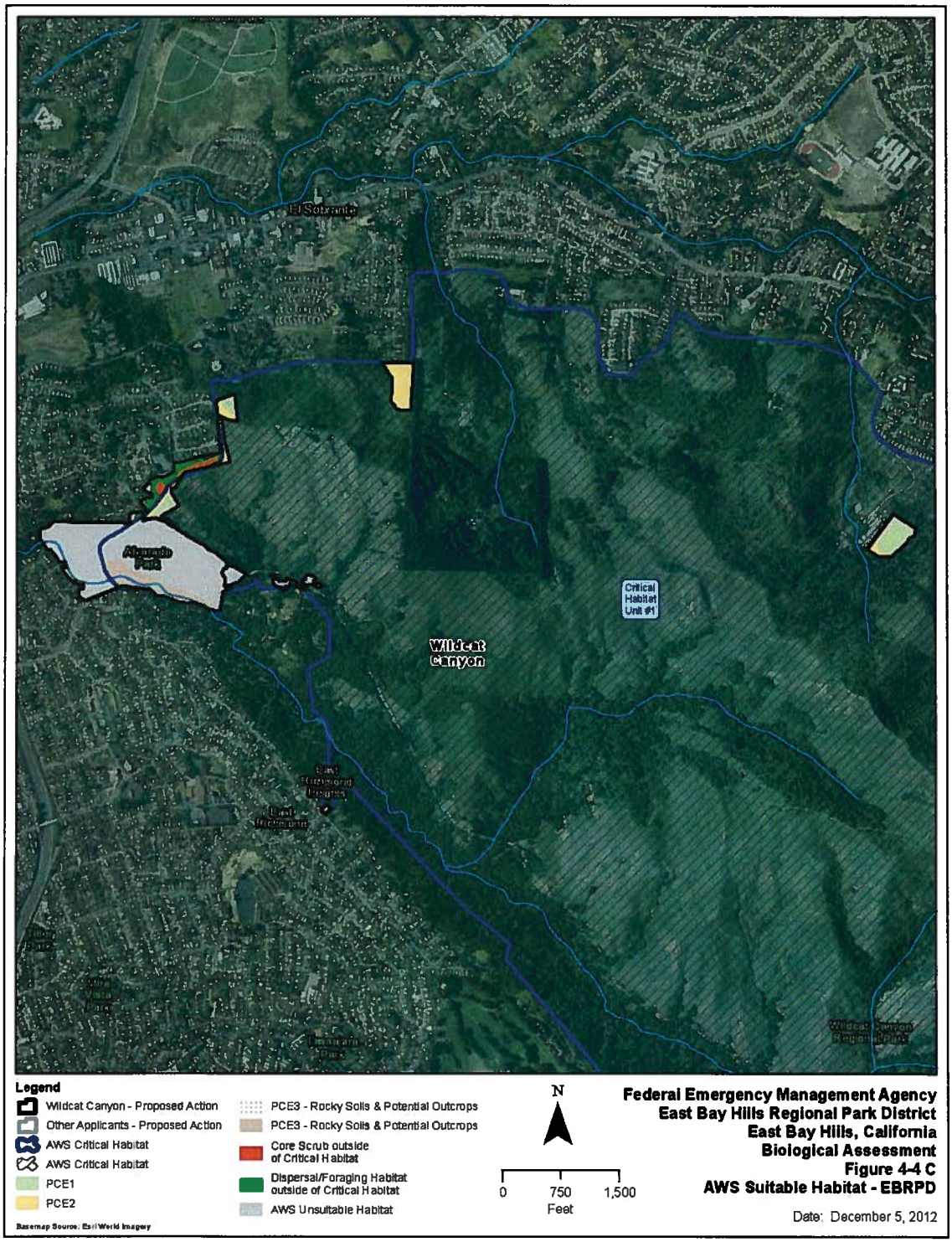

Figure 5C. Alameda Whipsnake Suitable Habitat and PCEs (EBRPD Map 3).

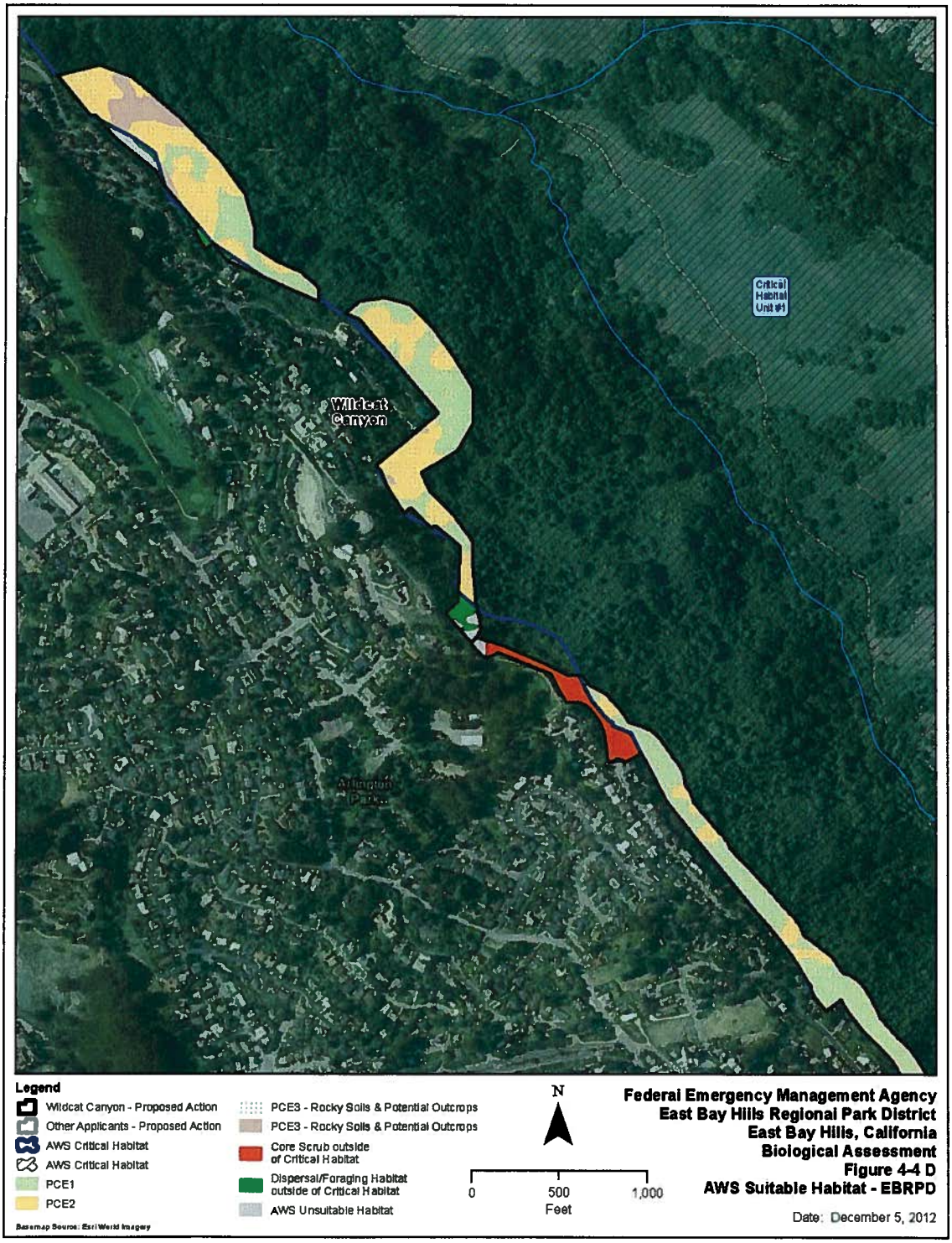

Figure 5D. Alameda Whipsnake Suitable Habitat and PCEs (EBRPD Map 4).

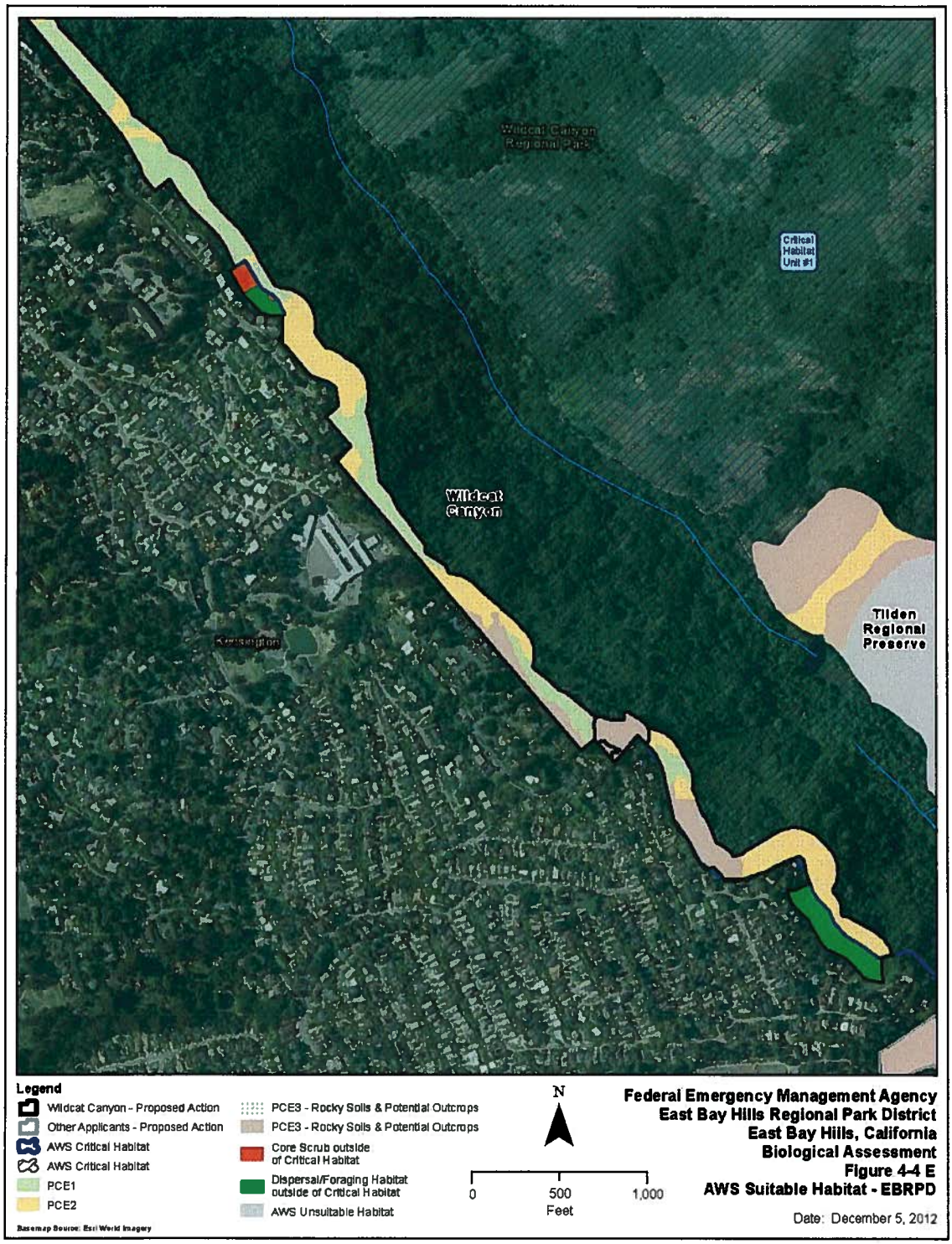

Figure 5E. Alameda Whipsnake Suitable Habitat and PCEs (EBRPD Map 5).

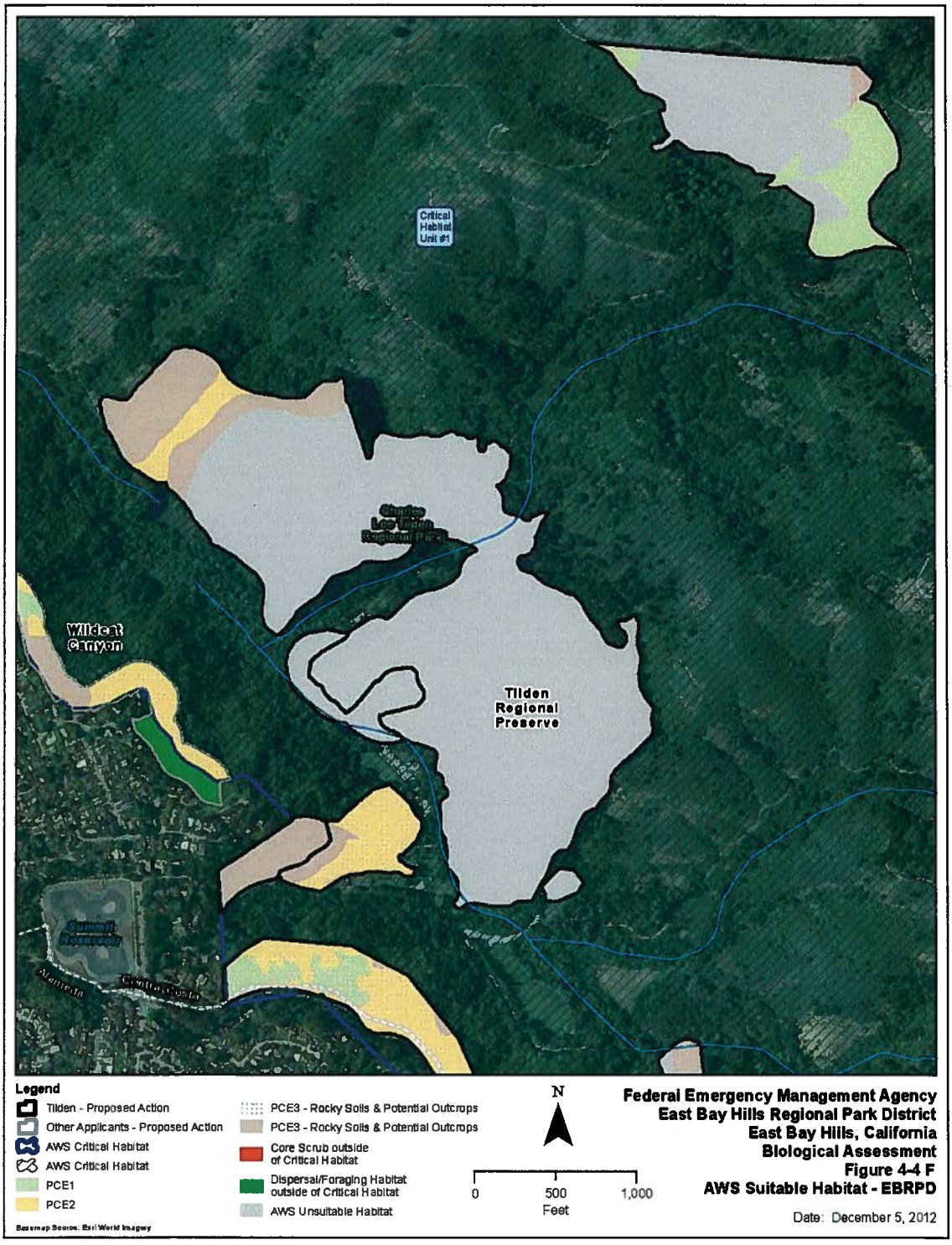

Figure 5F. Alameda Whipsnake Suitable Habitat and PCEs (EBRPD Map 6).

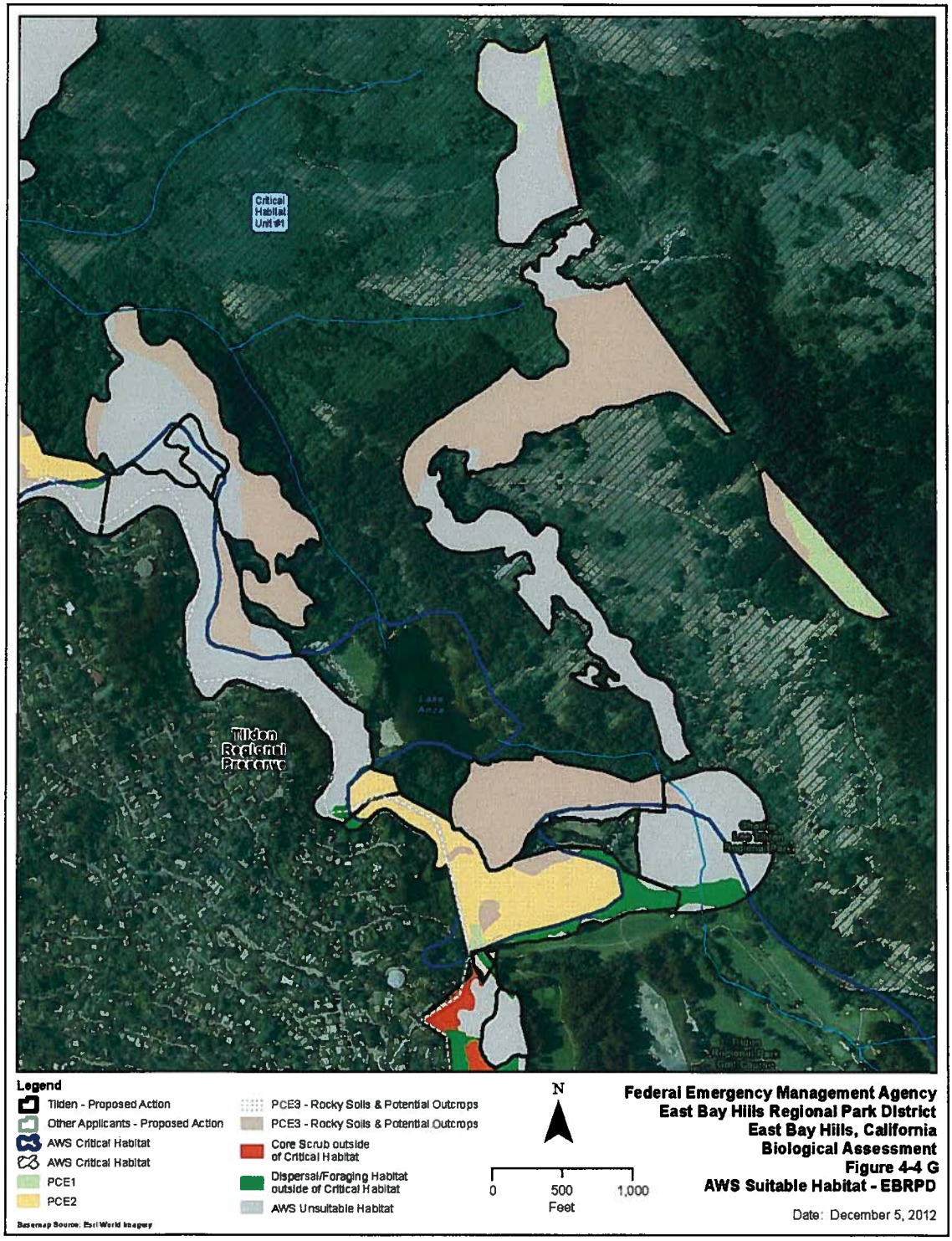

Figure 5G. Alameda Whipsnake Suitable Habitat and PCEs (EBRPD Map 7).

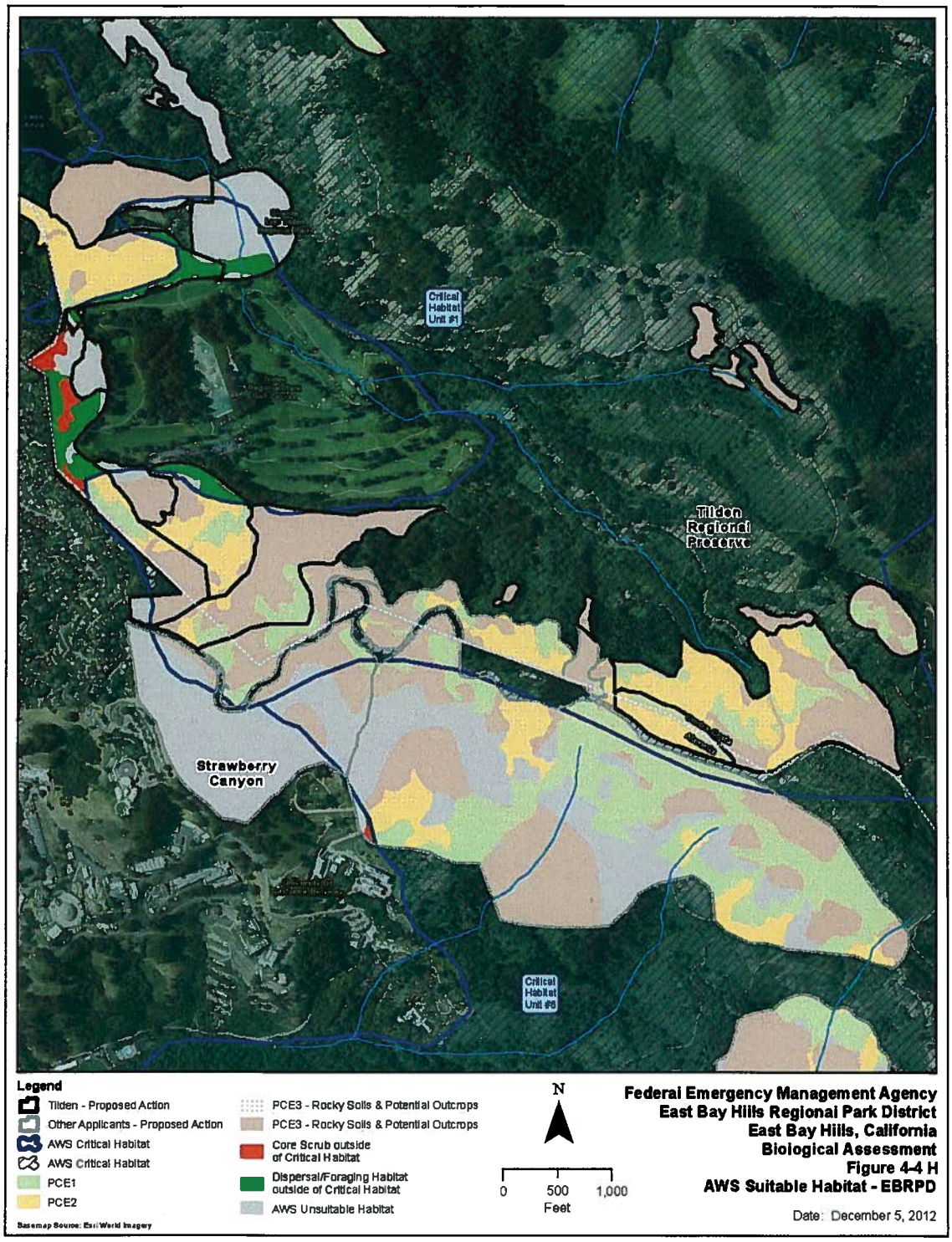

Figure 5H. Alameda Whipsnake Suitable Habitat and PCEs (EBRPD Map 8).

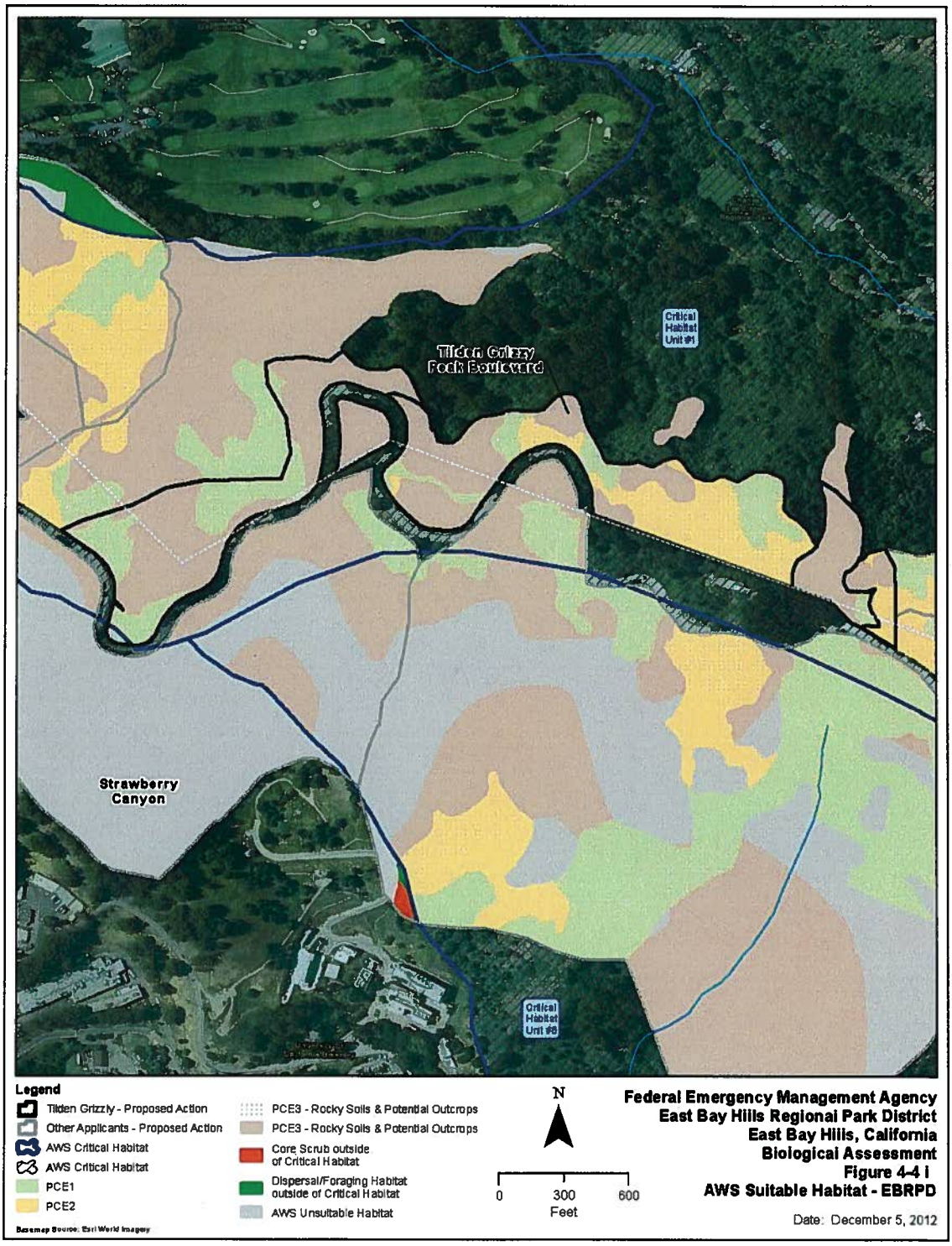

Figure 5I. Alameda Whipsnake Suitable Habitat and PCEs (EBRPD Map 9).

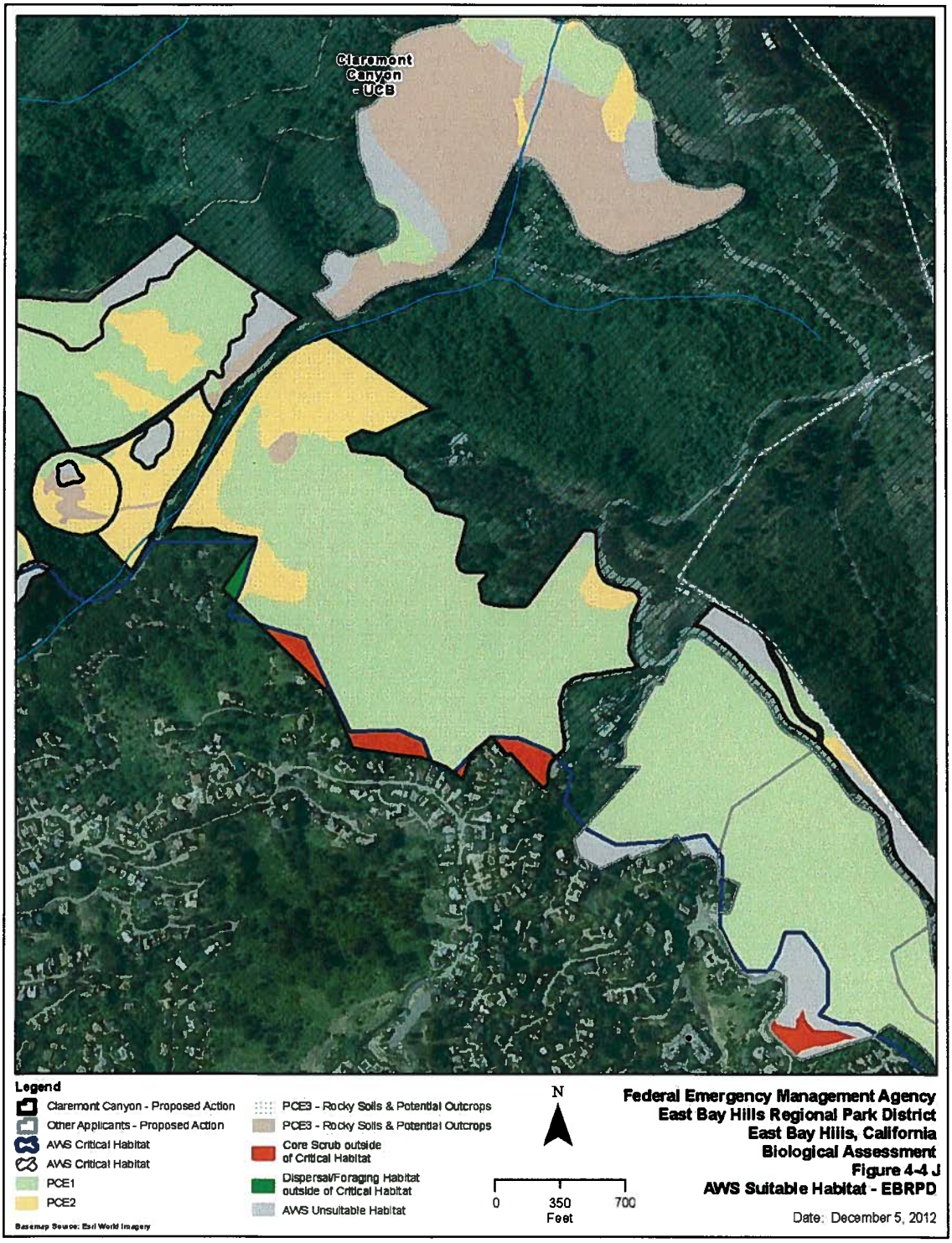

Figure 5J. Alameda Whipsnake Suitable Habitat and PCEs (EBRPD Map 10).

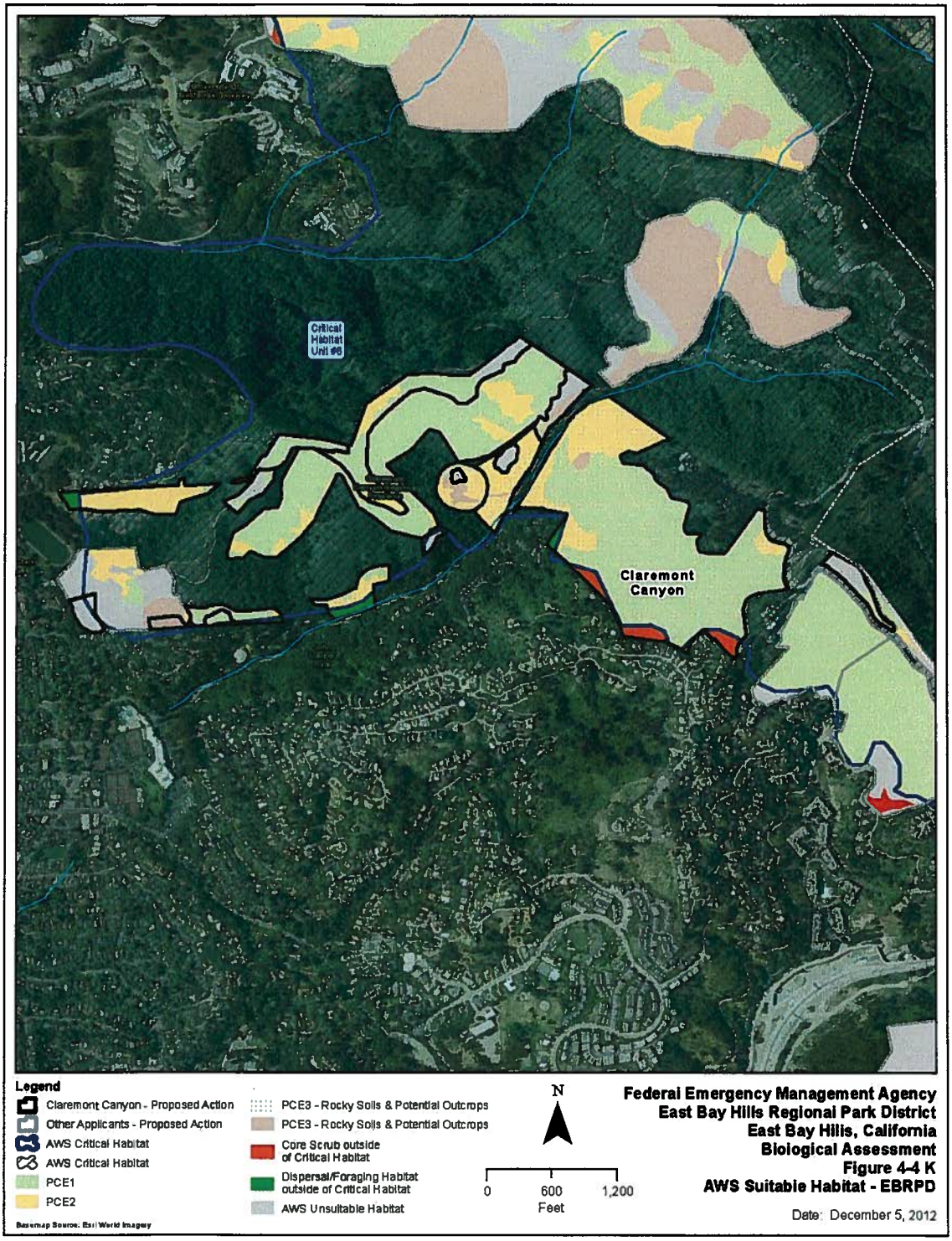

Figure 5K. Alameda Whipsnake Suitable Habitat and PCEs (EBRPD Map 11).

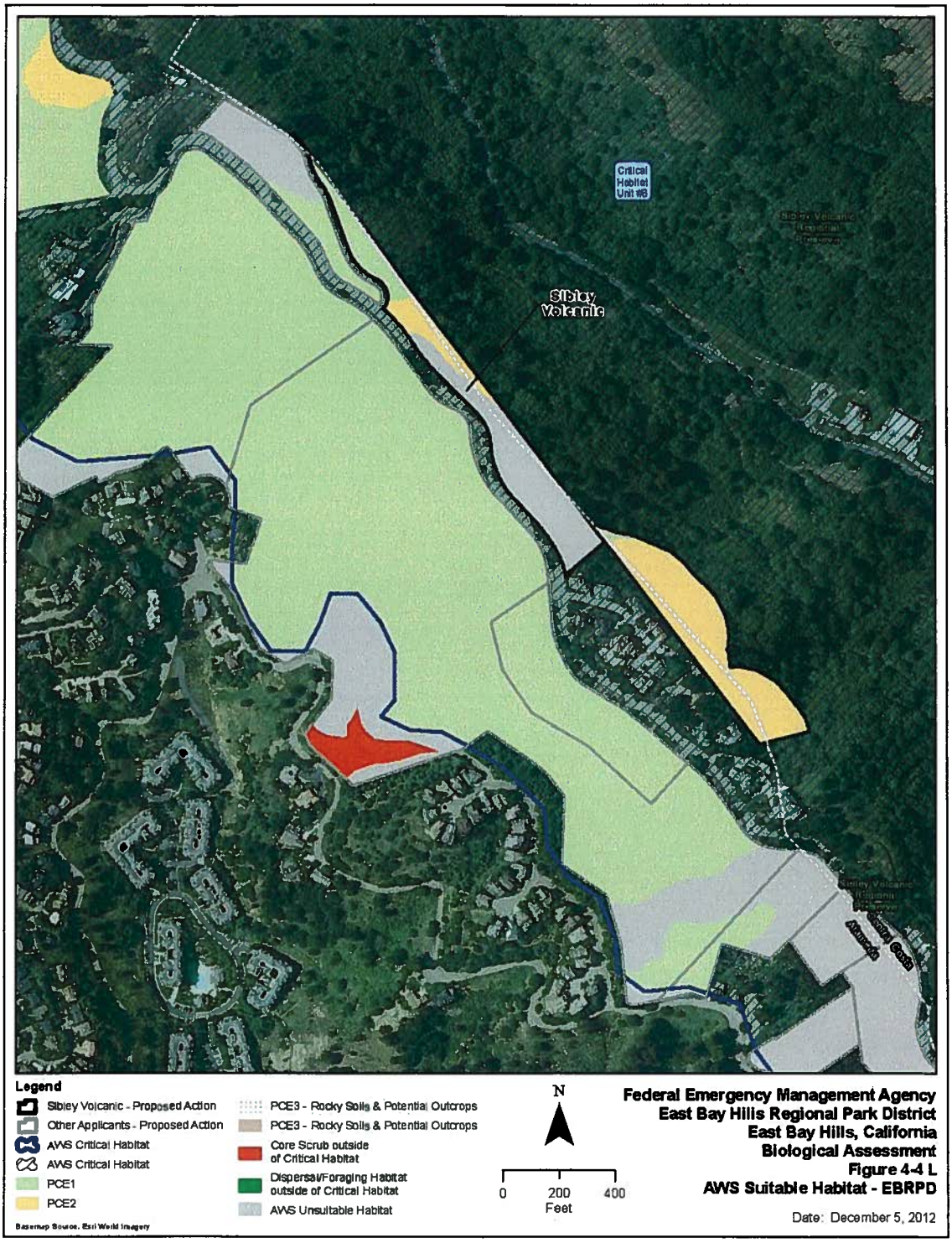

Figure 5L. Alameda Whipsnake Suitable Habitat and PCEs (EBRPD Map 12).

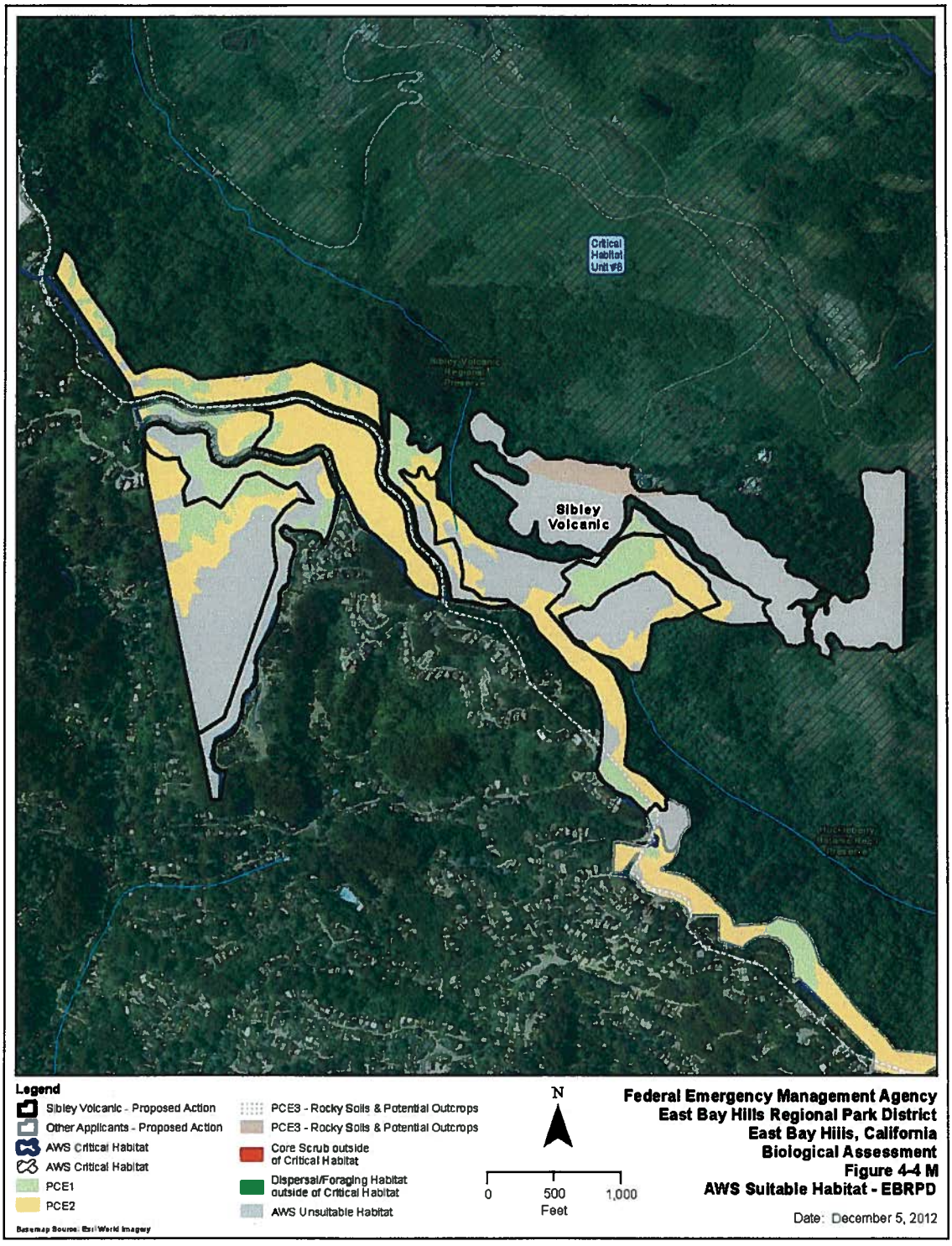

Figure 5M. Alameda Whipsnake Suitable Habitat and PCEs (EBRPD Map 13).

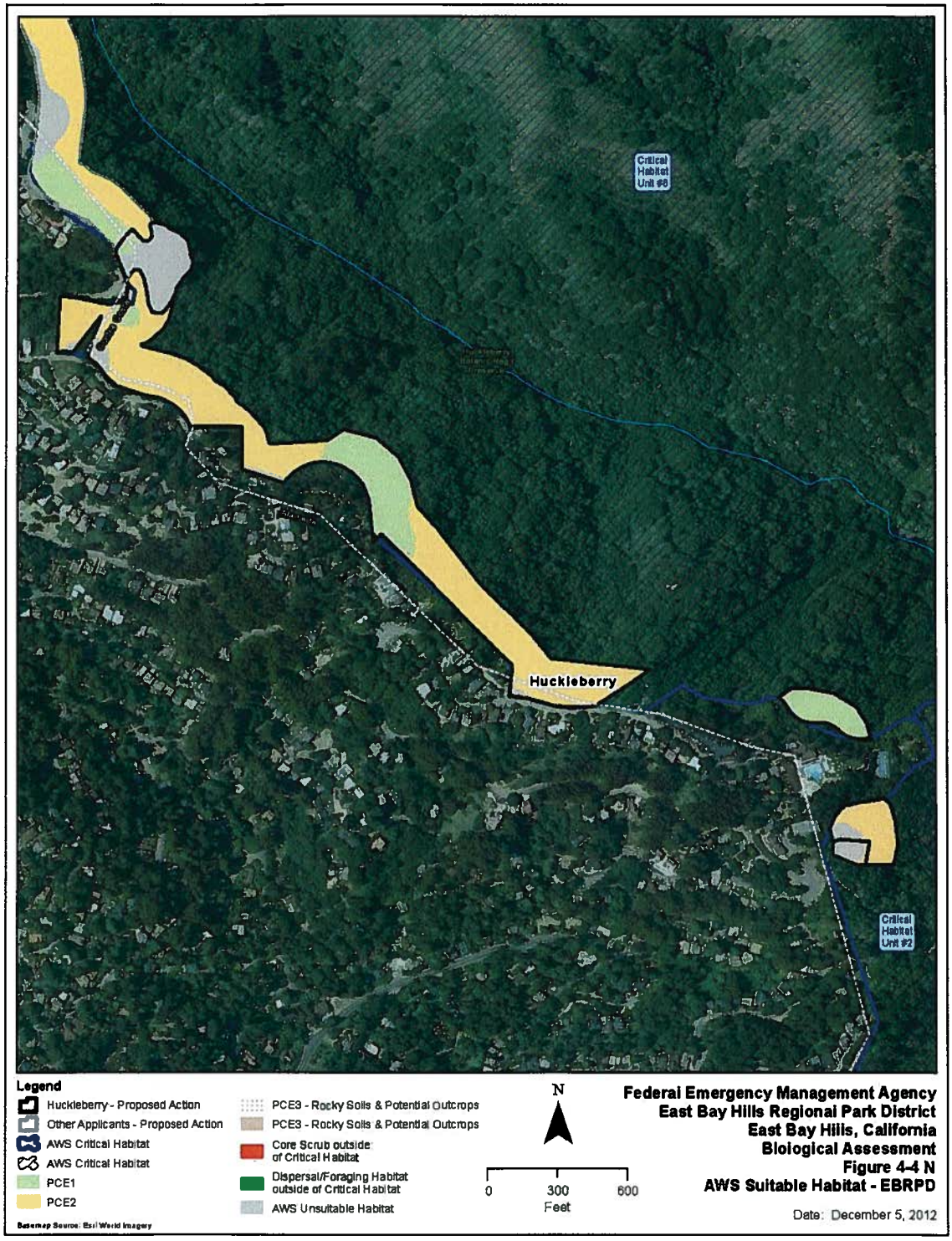

Figure 5N. Alameda Whipsnake Suitable Habitat and PCEs (EBRPD Map 14).

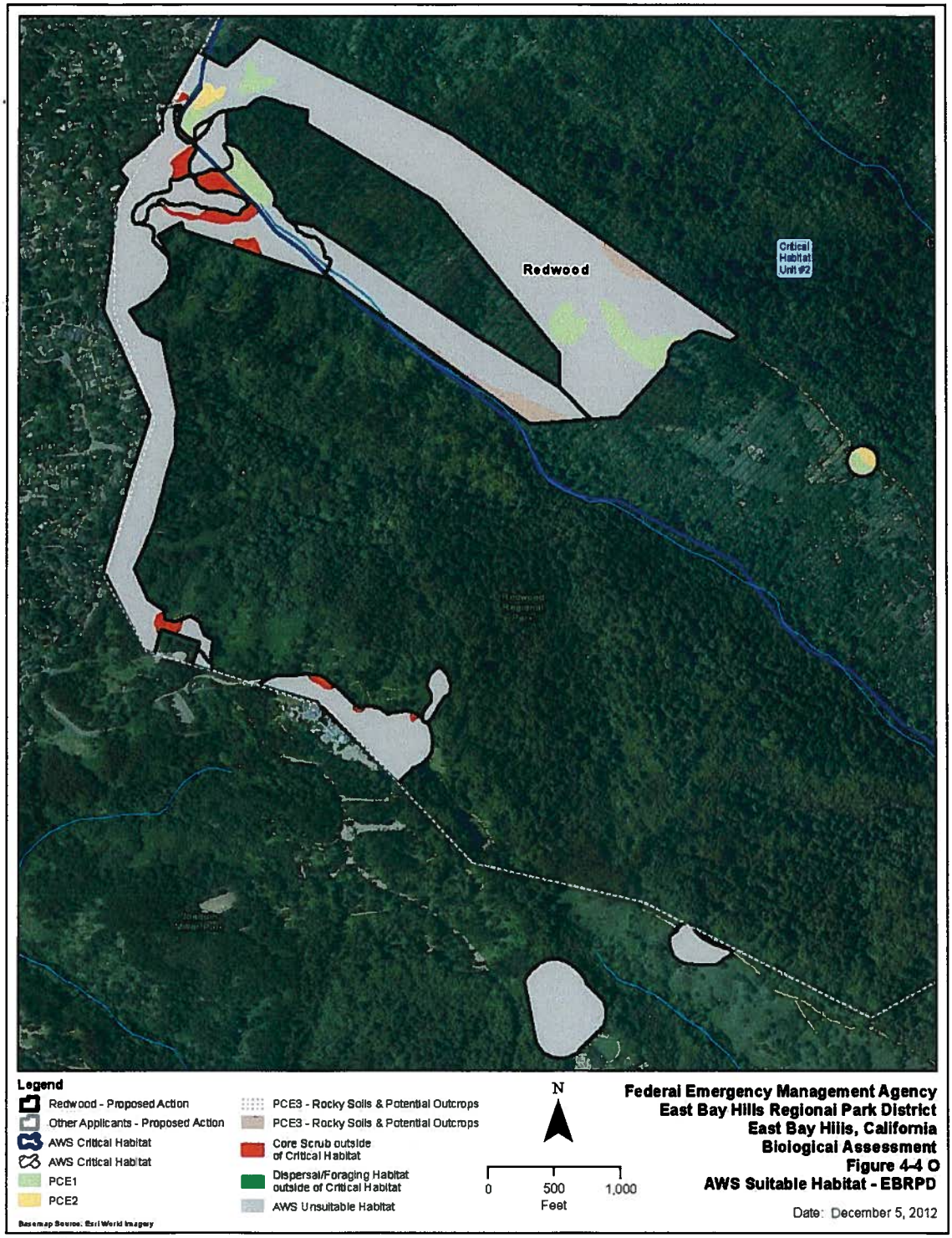

Figure 5O. Alameda Whipsnake Suitable Habitat and PCEs (EBRPD Map 15).

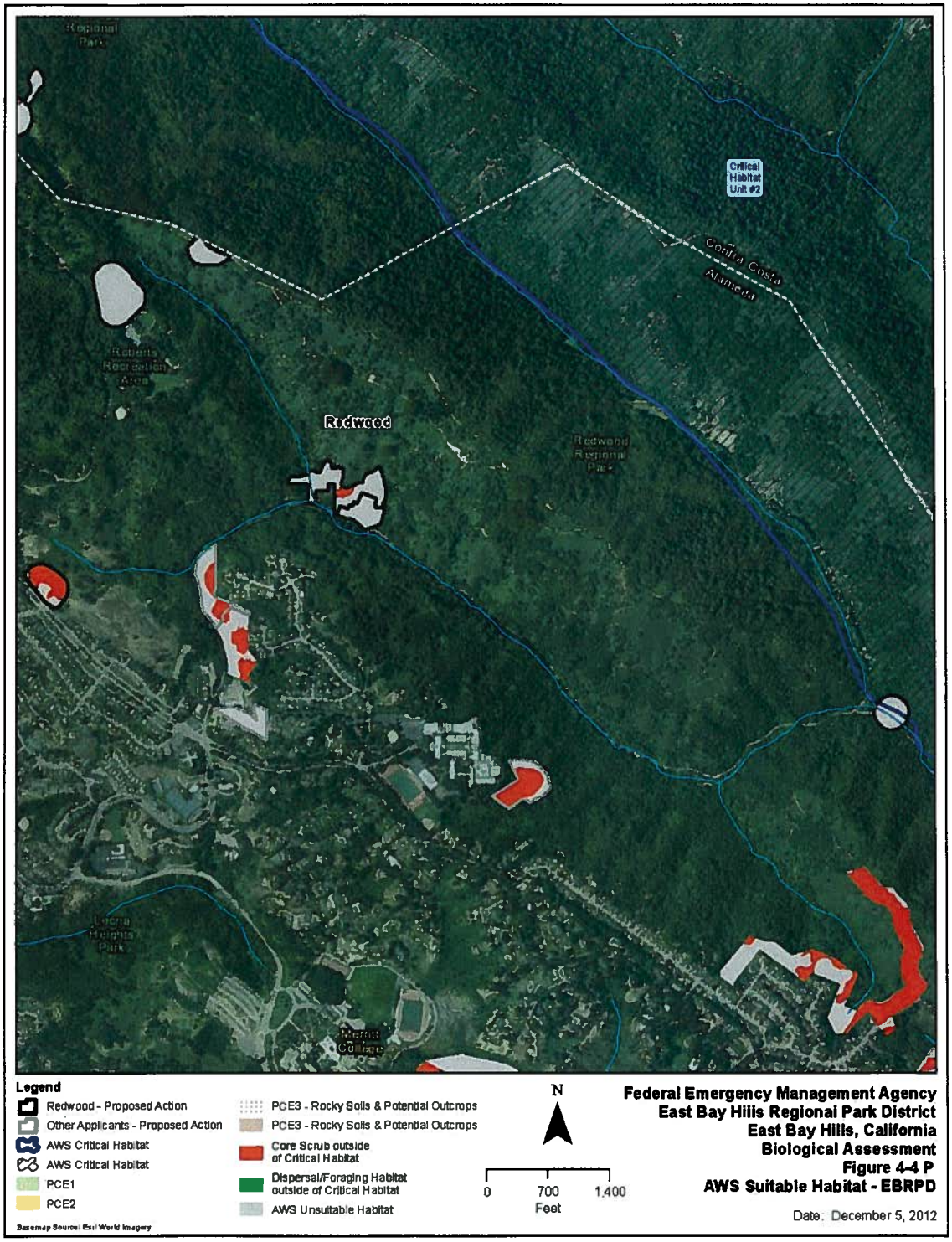

Figure 5P. Alameda Whipsnake Suitable Habitat and PCEs (EBRPD Map 16).

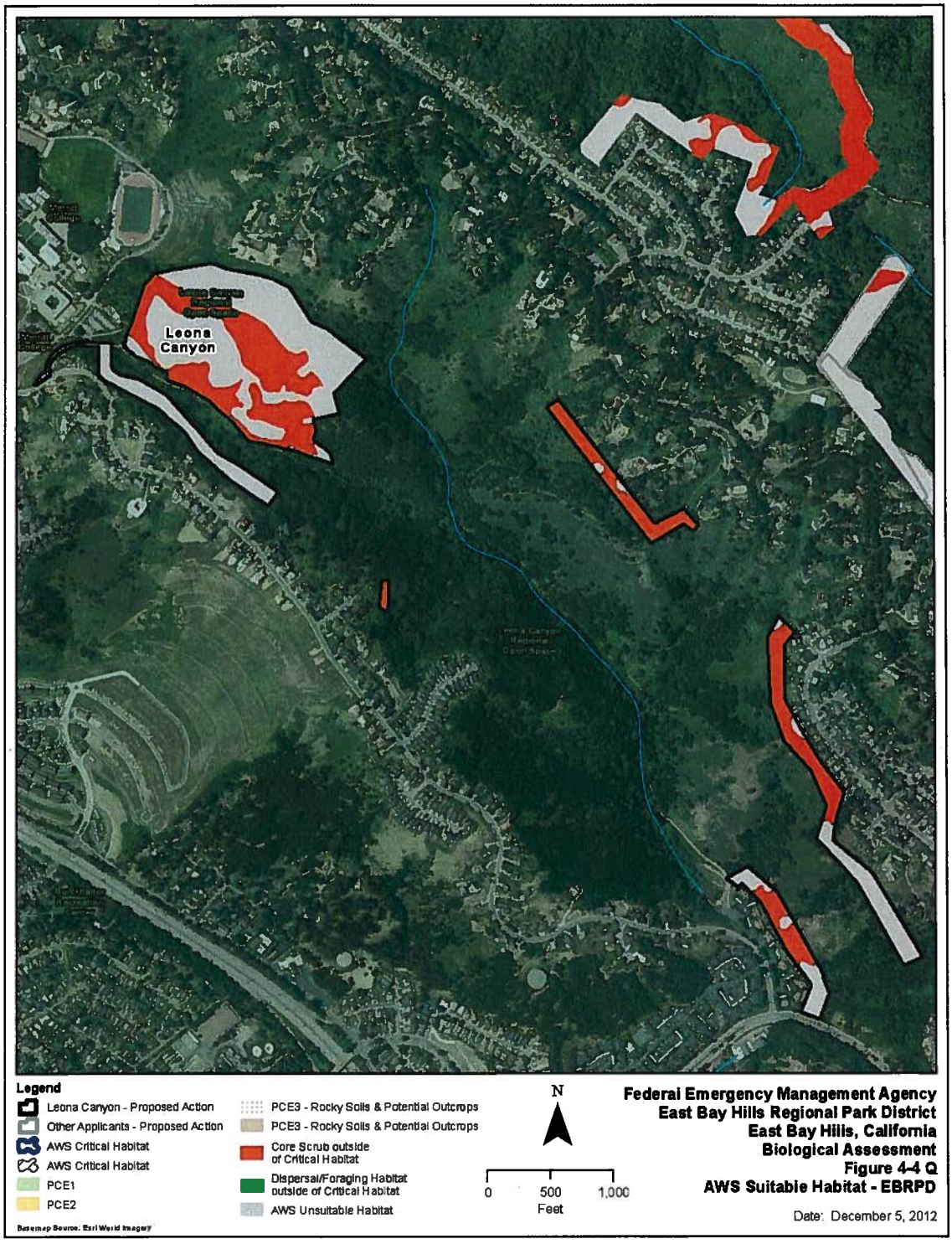

Figure 5Q. Alameda Whipsnake Suitable Habitat and PCEs (EBRPD Map 17).

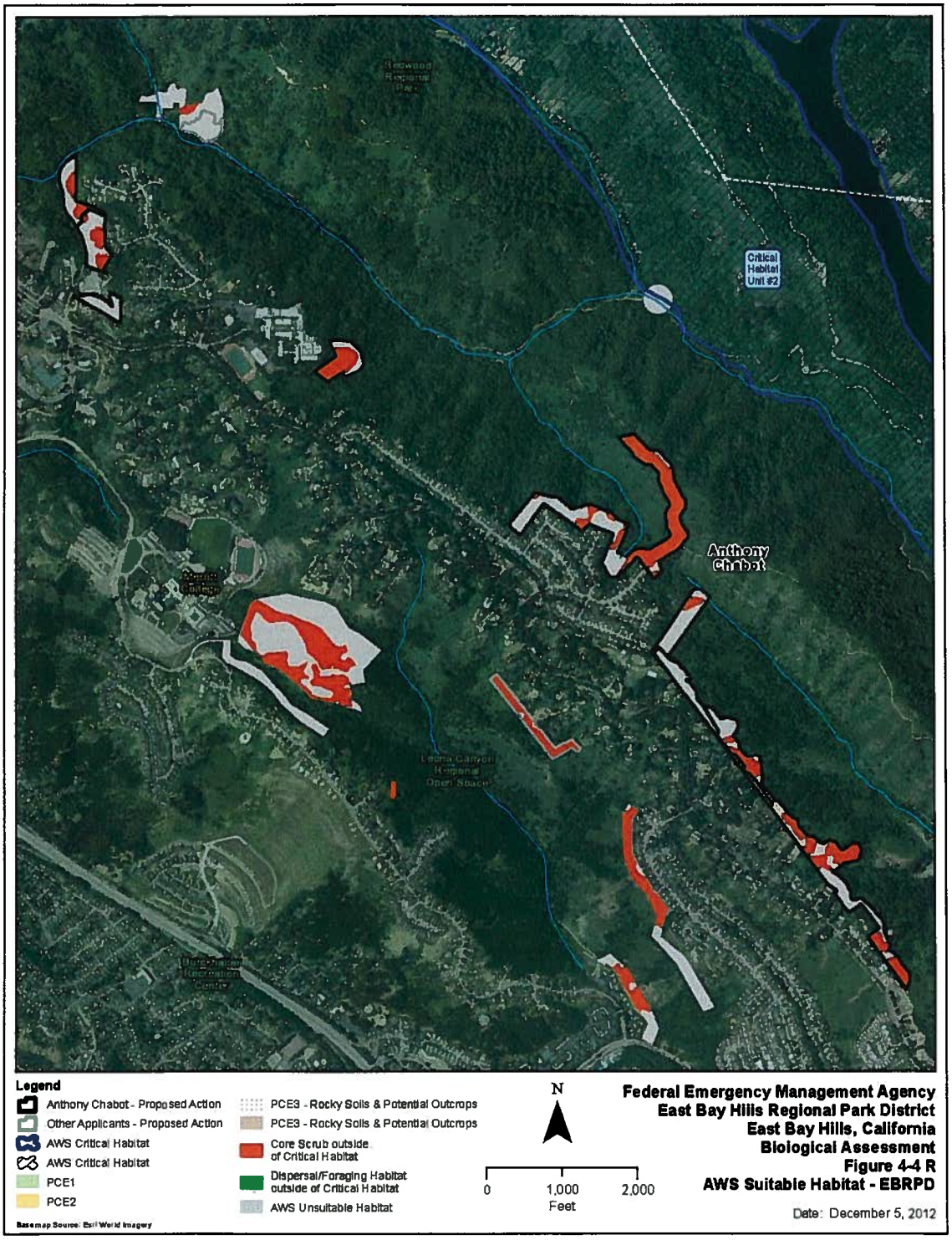

Figure 5R. Alameda Whipsnake Suitable Habitat and PCEs (EBRPD Map 18).

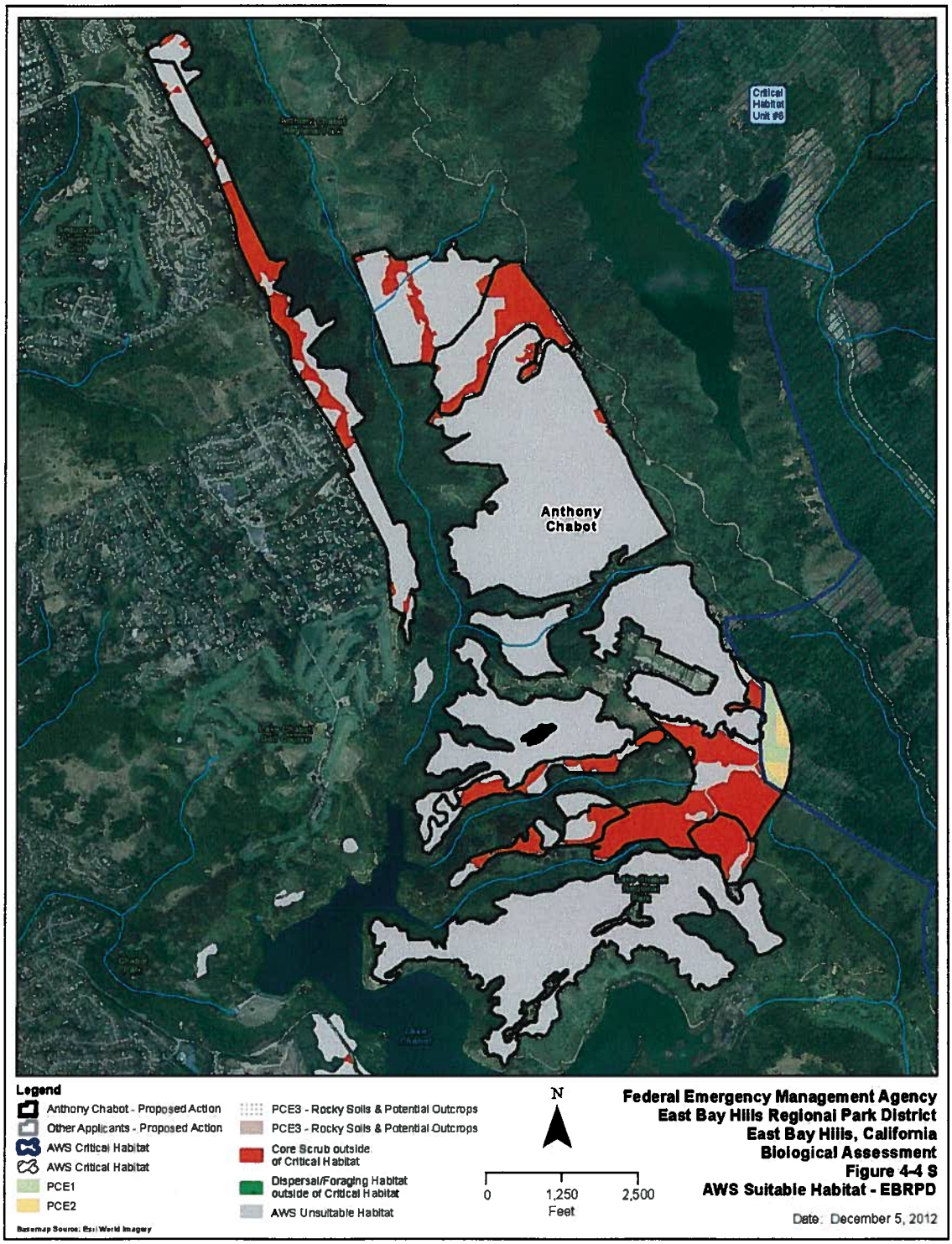

Figure 5S. Alameda Whipsnake Suitable Habitat and PCEs (EBRPD Map 19).

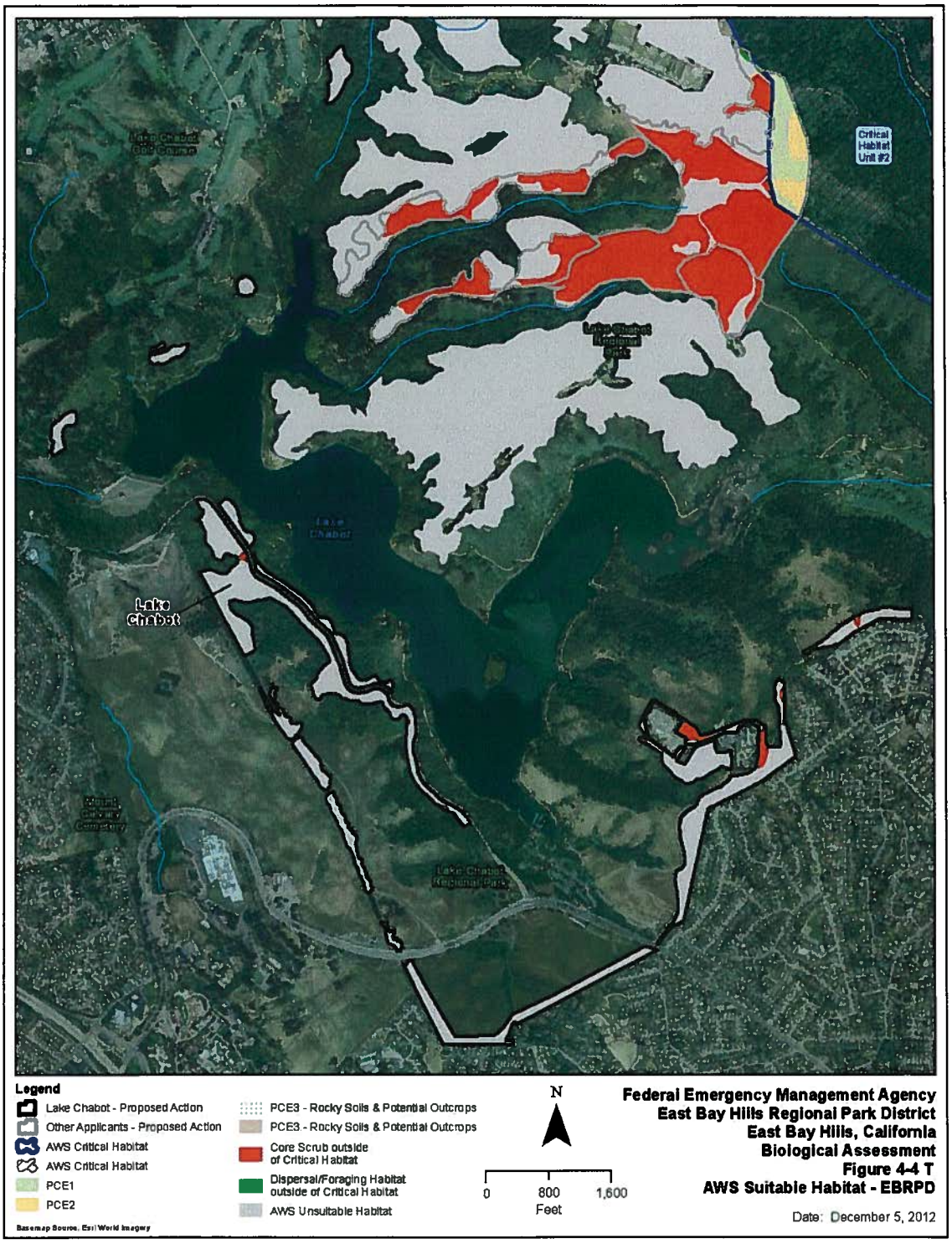

Figure 5T. Alameda Whipsnake Suitable Habitat and PCEs (EBRPD Map 20).