University of California
Mitigation Monitoring Program (CEQA)
Physical and Environmental Planning

Report on CEQA Environmental Impacts and associated Mitigation Measures by Project, Phase, Responsible Department(s), EIR(s)

Project Extracted: Hill Campus Fire Risk Reduction (HCFRR)

Project Phase(s): Planning, Working Drawings, Construction, Occupancy

EIR(s) Searched: Continuing Best Practices, 2020 LRDP EIR Mitigation Measures

NOTES:

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SUMMARY OF IMPACTS, MITIGATION MEASURES AND CONTINUING BEST PRACTICES

Project Name: Hill Campus Fire Risk Reduction (HCFRR) **Dept:** ATH, CAP, CFM, CHAN, CLA, CoB, DRS, EH&S, FS, HMA, NAF, P&T, PEP, PM, RBC, RES, RSSP, SO, **Phase:** P, W, C, O

Impact	Mitigation Measure or Continuing Best Practice
Aesthetics & Visual Quality	
IMPACT CBP AES 1: Projects under the 2020 LRDP would result in visual changes, through new construction on presently undeveloped sites, through replacement of existing structures with new structures, and through exterior renovations of existing structures. The design provisions of the 2020 LRDP would ensure those changes would not degrade the existing visual quality and character of their environs.	CBP AES-1-c: New Hill Campus projects would as a general rule conform to the design principles established in the Hill Campus Framework. While these principles would not preclude alternate design concepts when such concepts present the best solution for a particular site, the University would not depart from these principles except for solutions of extraordinary quality.
	CBP AES-1-d: To the extent feasible, future fuel management practices would include the selective replacement of high-hazard introduced plant species with native species: for example, the restoration of native grassland and oak-bay woodland though the eradication of invasive exotics, and replacement of aged pines and second-growth eucalyptus. Such conversions would be planned with care, however, to avoid significant disruption of faunal habitats.
Air Quality	
IMPACT CBP AIR 4: Emissions from construction activities associated with the 2020 LRDP would be controlled and would not lead to a violation of air quality standards.	CBP AIR-4-a: UC Berkeley shall continue to include in all construction contracts the measures specified below to reduce fugitive dust impacts: All disturbed areas, including quarry product piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using tarps, water, (non-toxic) chemical stabilizer/suppressant, or vegetative ground cover. All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or (nontoxic) chemical stabilizer/suppressant. When quarry product or trash materials are transported off-site, all material shall be covered, or at least two feet of freeboard space from the top of the container shall be maintained
	CBP AIR-4-b: UC Berkeley shall continue to implement the following control measure to reduce emissions of diesel particulate matter and ozone precursors from construction equipment exhaust: •Minimize idling time when construction equipment is not in use.

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Impact	Mitigation Measure or Continuing Best Practice
IMPACT LRDP MM AIR 4: Emissions from construction activities associated with the 2020 LRDP would be controlled and would not lead to a violation of air quality standards.	LRDP MM AIR-4-a: In addition, UC Berkeley shall include in all construction contracts the measures specified below to reduce fugitive dust impacts, including but not limited to the following: -All land clearing, grubbing, scraping, excavation, land leveling, grading, cut and fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking. -When demolishing buildings, water shall be applied to all exterior surfaces of the building for dust suppression. -All operations shall limit or expeditiously remove the accumulation of mud or dirt from paved areas of construction sites and from adjacent public streets as necessary. See also CBP HYD-1-b. •Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions by utilizing sufficient water or by covering. •Limit traffic speeds on unpaved roads to 15 mph. •Water blasting shall be used in lieu of dry sand blasting wherever feasible. •Install sandbags or other erosion control measures to prevent silt runoff to public roadways from sites with slopes over one percent. •To the extent feasible, limit area subject to excavation, grading, and other construction activity at any one time. •Replant vegetation in disturbed areas as quickly as possible.
	LRDP MM AIR-4-b: UC Berkeley shall implement the following control measures to reduce emissions of diesel particulate matter and ozone precursors from construction equipment exhaust: •To the extent that equipment is available and cost effective, UC Berkeley shall require contractors to use alternatives to diesel fuel, retrofit existing engines in construction equipment and employ diesel particulate matter exhaust filtration devices. •To the extent practicable, manage operation of heavy-duty equipment to reduce emissions, including the use of particulate traps.

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Impact	Mitigation Measure or Continuing Best Practice
Biological Resources	
IMPACT CBP BIO 2: New construction, land management and other 2020 LRDP activities would be designed and implemented to avoid any substantial adverse effect on any riparian habitat or sensitive natural communities.	CBP BIO-2-a, Part 1: Implementation of the 2020 LRDP, including provisions that ensure proposed projects on the Campus Park will be designed to avoid Natural Preserves and provide for protection and enhancement of riparian habitat along Strawberry Creek as prescribed in the Campus Park Design Guidelines, will avoid substantial adverse effect on riparian habitat or sensitive natural communities. The Natural Preserves are comprised of two subzones: the riparian areas along the streamcourse, and other rustic woodlands adjacent to these riparian areas. The riparian areas are dominated by native and naturalized plants forming dense woodlands along the streamcourse: their width may vary in response to local conditions, but in general should be at least 100', centered on the streamcourse. Management of the Natural Preserves will be based on ecological principles, including replacing invasive exotic plants with native plants suited to this biotic zone, replacing unhealthy plants and plants at the ends of their natural lives, and preserving and enhancing the habitat value of the zone, as prescribed in the 2020 LRDP.
	CBP BIO-2-a, Part 2: Implementation of the 2020 LRDP, including provisions that ensure proposed projects on the Campus Park will be designed to avoid Natural Preserves and provide for protection and enhancement of riparian habitat along Strawberry Creek as prescribed in the Campus Park Design Guidelines, will avoid substantial adverse effect on riparian habitat or sensitive natural communities. The Natural Preserves are comprised of two subzones: the riparian areas along the streamcourse, and other rustic woodlands adjacent to these riparian areas. The riparian areas are dominated by native and naturalized plants forming dense woodlands along the streamcourse: their width may vary in response to local conditions, but in general should be at least 100', centered on the streamcourse. Management of the Natural Preserves will be based on ecological principles, including replacing invasive exotic plants with native plants suited to this biotic zone, replacing unhealthy plants and plants at the ends of their natural lives, and preserving and enhancing the habitat value of the zone, as prescribed in the 2020 LRDP.
	CBP BIO-2-c: During planning and feasibility studies prior to development of specific projects or implementation of management plans in the Hill Campus, a habitat assessment will be conducted by a qualified biologist to identify and minimize potential impacts on riparian habitat, freshwater seeps, and native grassland sensitive natural communities. Detailed surveys will be conducted at appropriate times where necessary to confirm and map the extent of any sensitive natural communities. Where required to avoid a substantial adverse effect on such communities, in consultation with the CDFG, feasible changes to schedule, siting and design of projects or management plans will be developed and implemented.

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Impact	Mitigation Measure or Continuing Best Practice
IMPACT CBP BIO 3: Construction, land management practices, and other 2020 LRDP activities would be designed and implemented to avoid any substantial adverse effect on jurisdictional wetlands.	CBP BIO-3: Proposed projects on the Campus Park and Hill Campus will be designed to avoid designated jurisdictional wetlands and waters along the Strawberry Creek channel. As necessary, wetlands will be mapped and the extent of jurisdictional waters verified by the Corps during planning and feasibility studies prior to development of specific projects or implementation of management plans in the Hill Campus. When unavoidable, any modifications to Strawberry Creek and other jurisdictional waters will be coordinated with jurisdictional agencies, including the CDFG, Corps, and the RWQCB as necessary.
IMPACT CBP BIO 4: Construction, land management practices, and other 2020 LRDP activities would be designed and implemented to avoid any substantial interference with the movement of any native resident or migratory fish or wildlife species, or with established wildlife corridors or native wildlife nursery sites.	CBP BIO-4-a: Proposed projects in the Hill Campus will be designed to avoid obstructing important established wildlife corridors to the full feasible extent. Before any new fencing is installed for security purposes, UC Berkeley will consider the effect of such fencing on opportunities for wildlife movement, and will avoid new or expanded fencing which would obstruct important established movement corridors.
	CBP BIO-4-b: During planning and feasibility studies prior to development of specific projects or implementation of management plans in the Hill Campus, a habitat assessment will be conducted by a qualified biologist to identify and minimize potential impacts on wildlife movement opportunities, including avoidance of new fencing across Strawberry Creek and tributary drainages.
IMPACT CBP BIO 1: New construction, land management and other 2020 LRDP activities would not have a substantial adverse effect on special-status species, or unique vegetation elements that contribute to the campus character.	CBP BIO-1-a: UC Berkeley will continue to implement the Campus Specimen Tree Program to reduce adverse effects to specimen trees and flora. Replacement landscaping will be provided where specimen resources are adversely affected, either through salvage and relocation of existing trees and shrubs or through new plantings in kind or from species previously recorded on campus, at a ratio of 3:1, as directed by the Campus Landscape Architect. New plantings are selected as horticulturally appropriate at largest possible nursery size. (amended 2008)
	CBP BIO-1-c: Because trees and other vegetation require routine maintenance, as trees age and become senescent, UC Berkeley would continue to undertake trimming, thinning, or removal, particularly if trees become a safety hazard. Vegetation in the Hill Campus requires continuing management for fire safety, habitat enhancement, and other objectives. This may include removal of mature trees such as native live oaks and non-native plantings of eucalyptus and pine.

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IMPACT LRDP MM BIO 1: New construction, land management and other 2020 LRDP activities would not have a substantial adverse effect on special-status species, or unique vegetation elements that contribute to the campus character.	LRDP MM BIO-1-a: UC Berkeley will, to the full feasible extent, avoid the disturbance or removal of nests of raptors and other special-status bird species when in active use. A preconstruction nesting survey for loggerhead shrike or raptors, covering a 100 yard perimeter of the project site, would be conducted during the months of March through July prior to commencement of any project that may impact suitable nesting habitat on the Campus Park and Hill Campus. The survey would be conducted by a qualified biologist no more than 30 days prior to initiation of disturbance to potential nesting habitat. In the Hill Campus, surveys would be conducted for new construction projects involving removal of trees and other natural vegetation. In the Campus Park, surveys would be conducted for construction projects involving removal of mature trees within 100 feet of a Natural Area, Strawberry Creek, and the Hill Campus. If any of these species are found within the survey area, grading and construction in the area would not commence, or would continue only after the nests are protected by an adequate setback approved by a qualified biologist. To the full feasible extent, the nest location would be preserved, and alteration would only be allowed if a qualified biologist verifies that birds have either not begun egg-laying and incubation, or that the juveniles from those nests are foraging independently and capable of survival. A preconstruction survey is not required if construction activities commence during the non-nesting season (August through February)
	LRDP MM BIO-1-b: UC Berkeley will, to the full feasible extent, avoid the remote potential for direct mortality of special-status bats and destruction of maternal roosts. A preconstruction roosting survey for special-status bat species, covering the project site and any affected buildings, would be conducted during the months of March through August prior to commencement of any project that may impact suitable maternal roosting habitat on the Campus Park and Hill Campus. The survey would be conducted by a qualified biologist no more than 30 days prior to initiation of disturbance to potential roosting habitat. In the Hill Campus, surveys would be conducted for new construction projects prior to grading, vegetation removal, and remodel or demolition of buildings with isolated attics and other suitable roosting habitat. In the Campus Park, surveys would be conducted for construction projects prior to remodel or demolition of buildings with isolated attics. If any maternal roosts are detected during the months of March through August, construction activities would not commence, or would continue only after the roost is protected by an adequate setback approved by a qualified biologist. To the full feasible extent, the maternal roost location would be preserved, and alteration would only be allowed if a qualified biologist verifies that bats have completed rearing young, that the juveniles are foraging independently and capable of survival, and bats have been subsequently passively excluded from the roost location. A pre-construction survey is not required if construction activities commence outside the maternal roosting season (September through February).

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IMPACT LRDP MM BIO 1: New construction, land management and other 2020 LRDP activities would not have a substantial adverse effect on special-status species, or unique vegetation elements that contribute to the campus character.	LRDP MM BIO-1-c: During planning and feasibility studies prior to development of specific projects or adoption of management plans in the Hill Campus, a habitat assessment would be conducted by a qualified biologist to assess any potential impacts on special-status species. Detailed surveys would be conducted during the appropriate season where necessary to confirm presence or absence of any special-status species. Where required to avoid a substantial adverse effect on such species, in consultation with the CDFG and the USFWS feasible changes to schedule, siting and design of projects or management plans would be developed and implemented.
Cultural & Historic Resources	
IMPACT CBP CUL 1: Construction activities under the 2020 LRDP could have the potential to destroy a unique paleontological resource, or site, or unique geologic feature, but campus best practices would ensure this impact is less than significant.	CBP CUL-1: In the event that paleontological resource evidence or a unique geological feature is identified during project planning or construction, the work would stop immediately and the find would be protected until its significance can be determined by a qualified paleontologist or geologist. If the resource is determined to be a "unique resource," a mitigation plan would be formulated and implemented to appropriately protect the significance of the resource by preservation, documentation, and/or removal, prior to recommencing activities.
IMPACT CBP CUL 4: Projects developed under the 2020 LRDP could destroy significant prehistoric or historic archaeological resources. The mitigations would reduce this impact to less than significant. (See also LRDP Impact CUL-5.)	CBP CUL-4-b: In the event human or suspected human remains are discovered, UC Berkeley would notify the County Coroner who would determine whether the remains are subject to his or her authority. The Coroner would notify the Native American Heritage Commission if the remains are Native American. UC Berkeley would comply with the provisions of Public Resources Code Section 5097.98 and CEQA Guidelines Section 15064.5(d) regarding identification and involvement of the Native American Most Likely Descendant and with the provisions of the California Native American Graves Protection and Repatriation Act to ensure that the remains and any associated artifacts recovered are repatriated to the appropriate group, if requested.
	CBP CUL-4-c: Prior to disturbing the soil, contractors shall be notified that they are required to watch for potential archaeological sites and artifacts and to notify UC Berkeley if any are found. In the event of a find, UC Berkeley shall implement LRDP Mitigation Measure CUL-4-b.

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IMPACT LRDP MM CUL 4: Projects developed under the 2020 LRDP could destroy significant prehistoric or historic archaeological resources. The mitigations would reduce this impact to less than significant. (See also LRDP Impact CUL-5.)	LRDP MM CUL-4-a, Part 2: UC Berkeley will create an internal document: a UCB Campus Archaeological Resources Sensitivity Map. The map will identify only the general locations of known and potential archaeological resources within the 2020 LRDP planning area. For the Hill Campus, the map will indicate the areas along drainages as being areas of high potential for the presence of archaeological resources. If any project would affect a resource, then either the project will be sited to avoid the location or, in consultation with a qualified archaeologist, UC Berkeley will determine the level of archaeological investigation that is appropriate for the project site and activity, prior to any construction or demolition activities.
	LRDP MM CUL-4-b: If a resource is discovered during construction (whether or not an archaeologist is present), all soil disturbing work within 35 feet of the find shall cease. UC Berkeley shall contact a qualified archaeologist to provide and implement a plan for survey, subsurface investigation as needed to define the deposit, and assessment of the remainder of the site within the project area to determine whether the resource is significant and would be affected by the project, as outlined in Continuing Best Practice CUL-3-a. UC Berkeley would implement the recommendations of the archaeologist.
Geology, Seismicity & Soils	
IMPACT CBP GEO 2: Implementation of the 2020 LRDP, particularly in steep areas, could result in soil erosion. Given continuing campus best practices, however, a significant increase in erosion is not anticipated.	CBP GEO-2: Campus construction projects with potential to cause erosion or sediment loss, or discharge of other pollutants, would include the campus Stormwater Pollution Prevention Specification. This specification includes by reference the “Manual of Standards for Erosion and Sediment Control” of the Association of Bay Area Governments and requires that each large and exterior project develop an Erosion Control Plan.
Hydrology & Water Quality	
IMPACT CBP HYD 1: Implementation of the 2020 LRDP would not violate existing water quality standards or wastewater discharge requirements, given the provisions of the 2020 LRDP and campus best practices.	CBP HYD-1-a: During the plan check review process and construction phase monitoring, UC Berkeley (EH&S) will verify that the proposed project complies with all applicable requirements and BMPs.

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IMPACT CBP HYD 1: Implementation of the 2020 LRDP would not violate existing water quality standards or wastewater discharge requirements, given the provisions of the 2020 LRDP and campus best practices.	CBP HYD-1-b, Part 2: UC Berkeley shall continue implementing an urban runoff management program containing BMPs as published in the Strawberry Creek Management Plan, and as developed through the campus municipal Stormwater Management Plan completed for its pending Phase II MS4 NPDES permit. UC Berkeley will continue to comply with the NPDES stormwater permitting requirements by implementing construction and post construction control measures and BMPs required by project-specific SWPPPs and, upon its approval, by the Phase II SWMP to control pollution. Stormwater Pollution Prevention Plans would be prepared as required by the appropriate regulatory agencies including the Regional Water Quality Control Board and where applicable, according to the UC Berkeley Stormwater Pollution Prevention Specification to prevent discharge of pollutants and to minimize sedimentation resulting from construction and the transport of soils by construction vehicles.
IMPACT CBP HYD 2: Implementation of the 2020 LRDP, including associated construction activities, would not contribute substantial sedimentation or other pollutants in stormwater runoff that could cause sedimentation in local storm drains, and degrade the quality of receiving waters, given continuing campus best practices.	CBP HYD-2-d, Part 1: UC Berkeley shall continue to develop and implement the recommendations of the Strawberry Creek Management Plan and its updates, and construct improvements as appropriate. These recommendations include, but shall not be limited to, minimization of the amount of land exposed at any one time during construction as feasible; use of temporary vegetation or mulch to stabilize critical areas where construction staging activities must be carried out prior to permanent cover of exposed lands; installation of permanent vegetation and erosion control structures as soon as practical; protection and retention of natural vegetation; and implementation of post-construction structural and non-structural water quality control techniques.
	CBP HYD-2-d, Part 2: UC Berkeley shall continue to develop and implement the recommendations of the Strawberry Creek Management Plan and its updates, and construct improvements as appropriate. These recommendations include, but shall not be limited to, minimization of the amount of land exposed at any one time during construction as feasible; use of temporary vegetation or mulch to stabilize critical areas where construction staging activities must be carried out prior to permanent cover of exposed lands; installation of permanent vegetation and erosion control structures as soon as practical; protection and retention of natural vegetation; and implementation of post-construction structural and non-structural water quality control techniques.

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IMPACT CBP HYD 3: Implementation of the 2020 LRDP would not interfere with groundwater recharge or contribute to lowering of the local groundwater table, given the provisions of the 2020 LRDP and campus best practices.	CBP HYD-3: In addition to Hydrology Continuing Best Practices 1-a, 1-b, 2-a and 2-c above, UC Berkeley will continue to review each development project, to determine whether rainwater infiltration to groundwater is affected. If it is determined that existing infiltration rates would be adversely affected, UC Berkeley would design and implement the necessary improvements to retain and infiltrate stormwater. Such improvements could include retention basins to collect and retain runoff, grassy swales, infiltration galleries, planter boxes, permeable pavement, or other retention methods. The goal of the improvement should be to ensure that there is no net decrease in the amount of water recharged to groundwater that serves as freshwater replenishment to Strawberry Creek. The improvement should maintain the volume of flows and times of concentration from any given site at pre-development conditions.
IMPACT LRDP MM HYD 5: Projects implemented in the Hill Campus under the 2020 LRDP could alter drainage patterns and increase impervious surfaces, which could exceed the capacity of stormwater drainage systems, result in localized flooding, contribute to off-site flooding, and result in substantial siltation or erosion, but the mitigation would ensure this impact is less than significant.	LRDP MM HYD-5: In addition to Hydrology Continuing Best Practices 1-a, 1-b, 2-c, 4-a, 4-c and 4-e, projects proposed with potential to alter drainage patterns in the Hill Campus would be accompanied by a hydrologic modification analysis, and would incorporate a plan to prevent increases of flow from the newly developed site, preventing downstream flooding and substantial siltation and erosion.

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Impact	Mitigation Measure or Continuing Best Practice
Noise	
IMPACT CBP NOI 4: Noise resulting from demolition and construction activities necessary for implementation of the 2020 LRDP would, in some instances, cause a substantial temporary or periodic increase in noise levels, in excess of local standards prescribed in Section 13.40.070 of the City of Berkeley noise ordinance, at affected residential or commercial property lines. This is a significant and unavoidable impact.	CBP NOI-4-a: The following measures would be included in all construction projects: •Construction activities will be limited to a schedule that minimizes disruption to uses surrounding the project site as much as possible. Construction outside the Campus Park area will be scheduled within the allowable construction hours designated in the noise ordinance of the local jurisdiction to the full feasible extent, and exceptions will be avoided except where necessary. •As feasible, construction equipment will be required to be muffled or controlled. •The intensity of potential noise sources will be reduced where feasible by selection of quieter equipment (e.g. gas or electric equipment instead of diesel powered, low noise air compressors). •Functions such as concrete mixing and equipment repair will be performed off-site whenever possible. For projects requiring pile driving: •With approval of the project structural engineer, pile holes will be pre-drilled to minimize the number of impacts necessary to seat the pile. •Pile driving will be scheduled to have the least impact on nearby sensitive receptors. •Pile drivers with the best available noise control technology will be used. For example, pile driving noise control may be achieved by shrouding the pile hammer point of impact, by placing resilient padding directly on top of the pile cap, and/or by reducing exhaust noise with a sound-absorbing muffler. •Alternatives to impact hammers, such as oscillating or rotating pile installation systems, will be used where possible.
	CBP NOI-4-b: UC Berkeley will continue to precede all new construction projects with community outreach and notification, with the purpose of ensuring that the mutual needs of the particular construction project and of those impacted by construction noise are met, to the extent feasible.
Public Services	
IMPACT CBP PUB 2: Implementation of the 2020 LRDP would result in limited new development in the Hill Campus, but would not expose people or structures in the Hill Campus to a significant risk of loss, injury or death involving wildland fires.	CBP PUB-2.1-a: UC Berkeley would continue to comply with Title 19 of the California Code of Regulations, which mandates firebreaks of up to 100 feet around buildings or structures in, upon or adjoining any mountainous, forested, brush- or grass-covered lands.

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Impact	Mitigation Measure or Continuing Best Practice
IMPACT LRDP MM PUB 2: Implementation of the 2020 LRDP could temporarily result in emergency access constraints, but the mitigations would reduce this impact to a less than significant level.	LRDP MM PUB-2.4-a: In order to ensure adequate access for emergency vehicles when construction projects would result in temporary lane or roadway closures, campus project management staff would consult with the UCPD, campus EH&S, the BFD and ACFD to evaluate alternative travel routes and temporary lane or roadway closures prior to the start of construction activity. UC Berkeley will ensure the selected alternative travel routes are not impeded by UC Berkeley activities.
	LRDP MM PUB-2.4-b: To the extent feasible, the University would maintain at least one unobstructed lane in both directions on campus roadways at all times, including during construction. At any time only a single lane is available due to construction-related road closures, the University would provide a temporary traffic signal, signal carriers (i.e. flagpersons), or other appropriate traffic controls to allow travel in both directions. If construction activities require the complete closure of a roadway, UC Berkeley would provide signage indicating alternative routes. In the case of Centennial Drive, any complete road closure would be limited to brief interruptions of traffic required by construction operations.
Transportation & Traffic	
IMPACT CBP TRA 3: Construction-related activity under the 2020 LRDP would not substantially increase traffic loads or substantially decrease roadway capacity over current conditions. The best practices would continue to be implemented.	CBP TRA-3-a: Early in construction period planning UC Berkeley shall meet with the contractor for each construction project to describe and establish best practices for reducing construction-period impacts on circulation and parking in the vicinity of the project site.
Utilities & Service Systems	
IMPACT LRDP MM USS 3: Projects implemented in the Hill Campus under the 2020 LRDP could alter drainage patterns and increase impervious surfaces, which could exceed the capacity of stormwater drainage systems, but the mitigation would ensure this impact is less than significant.	LRDP MM USS-3.2: In addition to Best Practice USS-3.1, projects proposed with potential to alter drainage patterns in the Hill Campus would be accompanied by a hydrologic modification analysis, and would incorporate a plan to prevent increases of flow from the project site, preventing downstream flooding and substantial siltation and erosion.
IMPACT LRDP MM USS 5: Implementation of the 2020 LRDP may result in increased generation of solid waste, but is not anticipated to exceed the capacity of permitted sites.	LRDP MM USS-5.2: Contractors on future UC Berkeley projects implemented under the 2020 LRDP will be required to recycle or salvage at least 50% of construction, demolition, or land clearing waste. Calculations may be done by weight or volume, but must be consistent throughout.

GENERAL ACRONYMS

ABAG - Association of Bay Area Governments	CR - UC Commity Relations
ATH – Intercollegiate Athletics	DRC - UC Design Review Committee
BAAQMD - Bay Area Air Quality Management District	DRS - UC Dep't. of Recreational Sports
BAS - UC Administration	ECPC - UC Executive Chancellor's Planning Committee
BFD - Berkeley Fire Department	EH&S - UC Environment Health and Safety
BMP - Best Management Practice	HMA - Hill Management Authority
BPD - Berkeley Police Department	MM - UC CEQA Mitigation Measure
CAP – Asst. Director, Capital Projects	P&T - UC Parking & Transportation
CDFG - California Department of Fish and Game	PEP - UC Physical & Environmental Planning
CFM - Campus Fire Marshal	PM - Project Manager
CLA - Campus Landscape Architect	PPCS - UC Physical Plant & Campus Services
CoB - City of Berkeley	RES – Real Estate Services
CoO - City of Oakland	RSSP - Residential & Student Services Program
Corps - US Army Corps of Engineers	UCPD - UC Police Department
	USFWS - US Fish and Wildlife Service

ENVIRONMENTAL IMPACT REPORT ACRONYMS

1990 LRDP	1990 LRDP Mitigation Measure
55 LAG	55 Laguna St. San Francisco
CBP	Continuing Best Practice
DAP MM	Downtown Area Plan Mitigation Measures (informational only)
EPA EIR	EPA EIR Richmond Field Station
IP CBP	SCIP Continuing Best Practice
IP MM	SCIP Mitigation Measure
IPE MM	SCIP Mitigation Measure East
IPW MM	SCIP Mitigation Measure West
LRDP MM	LRDP Mitigation Measure
NAF	Northwest Animal Facility EIR
NEQSS	NE Quadrant Seismic Safety
NRLF	NW Regional Library Facility
RFS EIR	Richmond Field Station EIR
SRB1 MM	SRB1 Mitigation Measure
UND	Underhill Area Projects
UVA MP	University Village Master Plan

MONITORING PHASES

P: Planning and Schematic Design
W: CDs and Bid
C: Construction
O: Post-Occupancy

Resource Area	Timing of Implementation	Subapplicant	EHP Conditions	Source Document	Page
All	Prior, during, and after project implementation	All subapplicants	All subapplicants must notify FEMA of any changes to the project description, including planned Best Management Practices (BMPs).	FEIS	Pg. 1-660 and all appendices
All	Prior, during, and after project implementation	All subapplicants	Subapplicants must comply with the requirements listed in the U.S. Fish and Wildlife Service (USFWS) Biological Opinion including, but not limited to the measures listed herein.	USFWS Biological Opinion	Pg. 1-145
All	Prior, during, and after project implementation	All subapplicants	Subapplicants must comply with the requirements listed in the National Marine Fisheries Service (NMFS) concurrence letter for Section 7 of the Endangered Species Act (ESA) including, but not limited to, the measures listed herein.	NMFS NLAA Concurrence	Pg. 1-7
All	Prior, during, and after project implementation	All subapplicants	Subapplicants must comply with the requirements listed in the final Environmental Impact Statement (FEIS), including but not limited to those summarized herein.	FEIS	Pg. 1-660 and all appendices
All	Prior to project implementation	All subapplicants	Subapplicants will submit to FEMA, through Cal OES, will submit a complete Mitigation Monitoring and Work Plan Summary to FEMA prior to initiation of project activities. Each plan should include at a minimum: 1) a list of all commitments that will be implemented as part of this project (including applicable BMPs, Mitigation Measures, Terms and Conditions, Plans, and Reporting in the FEIS, Biological Opinion, and National Marine Fisheries Service concurrence documentation), 2) a schedule for submittal of all required plans including identification of agencies that each plan will be submitted to, and 3) name and contact information for each person responsible for the respective commitment.		
All	Prior, during, and after project implementation	All subapplicants	One paper and one electronic copy of plans or submittals required in compliance with the Environmental and Historic Preservation review, including those summarized herein, shall be provided to FEMA RIX a minimum of 2 weeks prior to submittal to applicable agencies, to allow for FEMA review and coordination. This time line may be modified with written consent from FEMA RIX Regional Environmental Officer.	FEIS	Pg. 1-660 and all appendices
All	Prior, during, and after project implementation	All subapplicants	Cal OES will ensure that the subapplicants prepare and implement Mitigation and Monitoring Plans in compliance with the requirements of the FEIS (including Appendix), Biological Opinion, and NMFS concurrence letter for Section 7 of the Endangered Species Act.		
All	Prior to project implementation	All subapplicants	Cal OES will ensure that the subapplicants implement measures included in this document.		
All	Prior, during, and after project implementation	All subapplicants	Cal OES will ensure that the subapplicants complete all reporting required in this document.		

Resource Area	Timing of Implementation	Subapplicant	Mitigation Measures	Source Document	Page
Biological Resources	During project implementation	All subapplicants	As part of the effort to avoid and minimize potential effects to federally listed species and their habitats, a U.S. Fish and Wildlife Service (USFWS)-approved biological monitor will be made available to be onsite and/or on-call during project implementation activities.	USFWS Biological Opinion	Pg. 50
Biological Resources	Prior to project implementation	All subapplicants	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 will serve as the onsite project biological monitors to the USFWS 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 USFWS that the biological monitor(s) are qualified to conduct the work. Information included in a request for authorization as a USFWS-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 USFWS; (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 USFWS will provide written approval within 10 business days of receipt of the provided information.	USFWS Biological Opinion	Pg. 50
Biological Resources	During project implementation	All subapplicants	The USFWS-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 will 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 USFWS-approved biological monitor exercises this authority, the USFWS and FEMA shall be notified by telephone and electronic mail within one (1) working day. The USFWS contact is the Coast Bay/Forest Foothills Division Chief, Endangered Species Program, at the Sacramento Fish and Wildlife Office at telephone (916) 414-6600.	USFWS Biological Opinion	Pg. 51
Biological Resources	Prior to project implementation	All subapplicants	The USFWS-approved biological monitor(s) will be onsite to monitor the initial vegetation removal and/or ground disturbance activities. The USFWS-approved biological monitor(s) shall perform a clearance survey for listed species immediately prior to the initial ground disturbance. In areas where California red-legged frog or Alameda whipsnake could occur, work will not commence until the biological monitor has determined that no California red-legged frogs or Alameda whipsnakes are in the work area.	USFWS Biological Opinion	Pg. 51
Biological Resources	Prior to project implementation	All subapplicants	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 USFWS-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.	USFWS Biological Opinion	Pg. 51
Biological Resources	During project implementation	All subapplicants	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 USFWS and FEMA immediately if an Alameda whipsnake or California red-legged frog is found, to determine necessary steps.	USFWS Biological Opinion	Pg. 51
Biological Resources	During project implementation	All subapplicants	If the USFWS-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 will be allowed to disperse on its own. The individual animal will be monitored by the USFWS-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 USFWS.	USFWS Biological Opinion	Pg. 51

Resource Area	Timing of Implementation	Subapplicant	Mitigation Measures	Source Document	Page
Biological Resources	During project implementation	All subapplicants	The USFWS-approved biological monitor(s) may use nets or their bare hands to capture California red-legged frogs at the project site. The USFWS-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 USFWS-approved biological monitors(s) shall limit the duration of handling and captivity of individual California red-legged frogs and Alameda whipsnakes. The USFWS-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.	USFWS Biological Opinion	Pg. 51
Biological Resources	During project implementation	All subapplicants	If the USFWS-approved biological monitor exercises stop work authority, the USFWS and FEMA will be notified by telephone and electronic mail within one working day. The USFWS-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 USFWS-approved biological monitor shall possess a working cellular telephone whose number will be provided to the USFWS and FEMA.	USFWS Biological Opinion	Pg. 51
Biological Resources	Prior to project implementation	All subapplicants	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 will be submitted to the USFWS for review and approval, with a copy to FEMA, prior to project implementation.	USFWS Biological Opinion	Pg. 51
Biological Resources	Prior to project implementation	All subapplicants	Following approval of plans identifying sensitive habitat by the USFWS, 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.	USFWS Biological Opinion	Pg. 51
Biological Resources	During project implementation	All subapplicants	During work activities, ground burrows, holes, and tunnels that provide shelter for small animals will be avoided under supervision of the biological monitor.	USFWS Biological Opinion	Pg. 51
Biological Resources	Prior to project implementation	All subapplicants	Pre-implementation surveys would be conducted to determine the presence of special-status plants within the project areas where vegetation management activities would be conducted. Botanists would conduct a botanical survey for the listed species during the blooming period for each species before vegetation management activities start. All special-status plants would be clearly flagged with high visibility flagging and avoided.	FEIS	Pg. 5.1-31
Biological Resources	Prior to project implementation	All subapplicants	To avoid and minimize disturbance to active nesting or fledging, work during avian nesting and fledging season (February 1 through July 31) will only be undertaken if the treatment area was cleared by an avian biologist. If active bird nests are present, a 50-foot non-disturbance zone will be maintained, unless adjustment is approved by the USFWS-approved biological monitor. If an injured bird is found, the USFWS, FEMA, and the nearest wildlife rehabilitation center will be called.	FEIS	Pg. 5.1-17
Biological Resources	During project implementation	All subapplicants	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 Best Management Practices (BMPs) in place.	USFWS Biological Opinion	Pg. 53
Biological Resources	During project implementation	All subapplicants	Work is estimated to be conducted in August through November to avoid the wet season and for avoiding nesting migratory birds (February-July), hibernating Alameda whipsnakes (November 1 - March 31), and will avoid the wet season for the California red-legged frog (October 15 – May 15).	USFWS Biological Opinion	Pg. 53
Biological Resources	During project implementation	All subapplicants	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.	USFWS Biological Opinion	Pg. 53
Biological Resources	During project implementation	UC Berkeley (PDM-PJ-09-CA-2005-03 and PDM-PJ-09-CA-2005-011)	Work may be conducted during the winter months (weather permitting) but activities will 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.	USFWS Biological Opinion	Pg. 10
Biological Resources	During project implementation	All subapplicants	Subapplicants will not apply herbicides just before or during California red-legged frog reproductive or rearing periods.	Appendix F	Pg. F-11

Resource Area	Timing of Implementation	Subapplicant	Mitigation Measures	Source Document	Page
Biological Resources	During project implementation	All subapplicants	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 will 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 discussed in Appendix E of the Biological Assessment (FEMA 2012) will be followed.	USFWS Biological Opinion	Pg. 53
Biological Resources	Prior to project implementation	All subapplicants	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 will consist of geotextile fabric with one-way exit funnels every 100 feet. The geotextile fabric will be ERTEC-E or equivalent as approved by the USFWS prior to installation. The lower portion of the fence will be buried to a depth of 4 to 6 inches, and the top of the fence will extend at least 36 inches above ground level. Shrubs within approximately 3 feet of the outside of the fence will be trimmed to prevent access via the shrubs over the fence. The fence will be secured to metal posts and/or wooden stakes to ensure it remains upright and does not fall over. Posts/stakes will 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 USFWS-approved biological monitor will 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 will be continuously maintained until all construction activities are completed. After construction has been completed, the exclusion fencing will be removed.	USFWS Biological Opinion	Pg. 53
Biological Resources	During project implementation	All subapplicants	Treatment activities involving heavy equipment and or significant ground disturbance within any areas determined to be suitable Alameda whipsnake habitat will 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.	USFWS Biological Opinion	Pg. 54
Biological Resources	During project implementation	All subapplicants	Subapplicants will apply herbicides after the Alameda whipsnake reproductive period (i.e., spring and early summer) to minimize exposures to potentially more sensitive early life stages.	Appendix F	Pg. F-10
Biological Resources	Prior to project implementation	EBRPD (HMGP 1731-16-34)	To avoid impact to Alameda whipsnake: Exclusion fencing will 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.	USFWS Biological Opinion	Pg. 54
Biological Resources	Prior to project implementation	EBRPD (HMGP 1731-16-34)	Skid trails will be sited a minimum of 10 feet away from Alameda whipsnake core scrub habitat and rock outcrops.	USFWS Biological Opinion	Pg. 54
Biological Resources	Prior to project implementation	EBRPD (HMGP 1731-16-34)	To avoid impact to Alameda whipsnake: Rock outcroppings and native shrubs within 50 feet of rock outcrops will be maintained and protected from vehicles using orange construction fencing.	USFWS Biological Opinion	Pg. 54
Biological Resources	During project implementation	EBRPD (HMGP 1731-16-34)	To avoid impact to Alameda whipsnake: Wood chips and landings will not be placed within 50 feet of rock outcrops.	USFWS Biological Opinion	Pg. 54
Biological Resources	Prior to project implementation	EBRPD (HMGP 1731-16-34)	East Bay Regional Park District (EBRPD) will develop, implement, and fund a USFWS-approved study of the effects of the proposed treatment activities (e.g., shrub thinning) on the Alameda whipsnake, prior to the initiation of any vegetation management activities within Alameda whipsnake habitat.	USFWS Biological Opinion	Pg. 54
Biological Resources	After project implementation	EBRPD (HMGP 1731-16-34)	EBRPD proposes to use animal grazing for initial and follow-up treatments. Animal grazing will be used during appropriate seasons to avoid effects to Alameda whipsnakes (although the vegetation treatment that results from grazing will have an effect on Alameda whipsnake habitat).	USFWS Biological Opinion	Pg. 54
Biological Resources	Prior to project implementation	EBRPD (HMGP 1731-16-34)	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.	USFWS Biological Opinion	Pg. 2
Biological Resources	During project implementation	EBRPD (HMGP 1731-16-34)	EBRPD will minimize the potential for the introduction of invasive plant species into suitable habitat for the Presidio clarkia by implementing a USFWS-approved invasive plant species control plan.	USFWS Biological Opinion	Pg. 2
Biological Resources	Prior to project implementation	All subapplicants	Prior to conducting activities within RTAs that support Arctostaphylos (manzanita) species, a USFWS-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.	USFWS Biological Opinion	Pg. 55

Resource Area	Timing of Implementation	Subapplicant	Mitigation Measures	Source Document	Page
Biological Resources	During project implementation	EBRPD (HMGP 1731-16-34)	No Arctostaphylos species, within any project area, will be removed without verification from the USFWS-approved biologist that the Arctostaphylos species in question is not a pallid manzanita.	USFWS Biological Opinion	Pg. 55
Biological Resources	During project implementation	EBRPD (HMGP 1731-16-34)	No living pallid manzanitas, as determined by the USFWS-approved biologist and the presence of any photosynthesizing leaves, will be removed or damaged. No pallid manzanita branches supporting photosynthesizing leaves will be cut, removed, or damaged.	USFWS Biological Opinion	Pg. 55
Biological Resources	During project implementation	EBRPD (HMGP 1731-16-34)	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.	USFWS Biological Opinion	Pg. 55
Biological Resources	Prior to project implementation	EBRPD (HMGP 1731-16-34)	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.	USFWS Biological Opinion	Pg. 56
Biological Resources	During project implementation	EBRPD (HMGP 1731-16-34)	Herbicide use within 300 feet of pallid manzanitas will be applied through direct application to the stump only.	USFWS Biological Opinion	Pg. 56
Biological Resources	Prior to project implementation	EBRPD (HMGP 1731-16-34)	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) will be establishment and clearly marked and use of a fine spray, which is more prone to drift and is more toxic than larger droplets at low application rates will be avoided.	USFWS Biological Opinion	Pg. 49
Biological Resources	During project implementation	EBRPD (HMGP 1731-16-34)	Goat grazing is prohibited within treatment areas containing pallid manzanitas.	USFWS Biological Opinion	Pg. 56
Biological Resources	Prior to project implementation	EBRPD (HMGP 1731-16-34)	Prior to implementing any activity within any recommended treatment areas (RTAs) containing pallid manzanitas, EBRPD will develop a USFWS-approved long-term adaptive management plan for all stands of pallid manzanitas that occur on EBRPD lands	USFWS Biological Opinion	Pg. 56
Biological Resources	During project implementation	All subapplicants	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 USFWS to identify areas infected with P. cinnamomi.	USFWS Biological Opinion	Pg. 56
Biological Resources	During project implementation	All subapplicants	Work within 100 feet of any area known to be infected with P. cinnamomi will be scheduled to occur after all other areas within 500 feet of the infection have been treated.	USFWS Biological Opinion	Pg. 56
Biological Resources	During project implementation	All subapplicants	A specific ingress/egress route, that minimizes the potential spread of P. cinnamomi, will be identified by a USFWS-approved biologist when working within watersheds that support pallid manzanitas.	USFWS Biological Opinion	Pg. 57
Biological Resources	During project implementation	All subapplicants	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 USFWS-approved substance known to disinfect P. cinnamomi contaminated equipment.	USFWS Biological Opinion	Pg. 57
Biological Resources	During project implementation	EBRPD (HMGP 1731-16-34)	All work within 300 feet or upslope of pallid manzanitas will be conducted using hand-tools only.	USFWS Biological Opinion	Pg. 57
Biological Resources	During project implementation	EBRPD (HMGP 1731-16-34)	Vehicles are prohibited off of service-roads within 200 feet of pallid manzanitas.	USFWS Biological Opinion	Pg. 57
Biological Resources	During project implementation	EBRPD (HMGP 1731-16-34)	No treatment activities, except for pile burning, will be conducted during the wet season (October 15 to May 15) within treatment areas containing pallid manzanitas.	USFWS Biological Opinion	Pg. 57
Biological Resources	During project implementation	All subapplicants	Pile burning will not occur within 100 feet of any area infected with P. cinnamomi during the wet season (October 15 to May 15).	USFWS Biological Opinion	Pg. 57
Biological Resources	During project implementation	All subapplicants	Within watersheds that support pallid manzanitas, the transportation of wood, slash, and other debris will only be conducted under the guidance of a USFWS-approved biologist and in a manner that minimizes the potential spread of P. cinnamomi.	USFWS Biological Opinion	Pg. 57
Biological Resources	Prior to project implementation	All subapplicants	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.	USFWS Biological Opinion	Pg. 57

Resource Area	Timing of Implementation	Subapplicant	Mitigation Measures	Source Document	Page
Biological Resources	During project implementation	All subapplicants	Subapplicants will check for burrows before building piles and avoid placing piles on large rodent burrows.	USFWS Biological Opinion	Pg. 55
Biological Resources	During project implementation	All subapplicants	Methodology for pile burning will require that subapplicants light each pile from one end (generally the uphill side on slopes) to allow Alameda whipsnakes to escape, rather than lighting the whole pile at once.	USFWS Biological Opinion	Pg. 55
Biological Resources	During project implementation	All subapplicants	Subapplicants will limit material in piles to an area of 4-inch diameter or less to limit heat penetration into the ground and provide short escape distance to wildlife.	USFWS Biological Opinion	Pg. 55
Biological Resources	During project implementation	All subapplicants	Pile burning will not occur within suitable Alameda whipsnake habitat during the hibernation season (November 1 – March 31).	USFWS Biological Opinion	Pg. 55
Biological Resources	During project implementation	All subapplicants	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).	USFWS Biological Opinion	Pg. 55
Geology, Seismicity, and Soils	Prior to project implementation	All subapplicants	Prior to implementation of any proposed vegetation removal activity, the recommended treatment area must be screened for landslide activation risk using the following procedure: 1. Subapplicants must refer to: - The most current available landslide mapping from the U.S. Geologic Survey (USGS) or the California Geological Survey for the proposed or connected project area (for example, the USGS 1997 Summary Distribution of Slides and Earth Flows in the San Francisco Bay Region, California. OFR 97-745c). - Geographic information systems slope steepness mapping for the proposed or connected project area. 2. If all of the following criteria are satisfied, no further action to address potential landslide activation will be required: - The area to be treated is in an area listed as “stable,” “few landslides,” or equivalent. - The average slope steepness of the area to be treated is less than 10° (about 18%). - There is no visible evidence of landslide activity (e.g., scarps, crooked trees, landslide generated debris piles) within the area to be treated, as documented by field reconnaissance. - No habitable structures are within 100 feet of the toe of the slope downgradient of the area to be treated. 3. Subapplicants must determine on a case-by-case basis whether to retain a qualified professional (e.g., engineering geologist or geotechnical engineer) to conduct a geotechnical reconnaissance to evaluate the potential impacts of fuel reduction activities on future landslide potential if: - A habitable structure is located within 100 feet of the toe of the slope downhill of the treatment area. - The prescribed treatment will include the use of heavy equipment and significant ground disturbing activities (i.e., this requirement will not apply to methods such as hand treatment, weed-eating, or chemical treatment), and one or more of the following conditions is identified: - The treatment area is listed as “unstable” or “many landslides” on applicable slope stability mapping. - The average slope steepness of the treatment area is greater than 10° (about 18%). - There is visible evidence of landslide activity (e.g., scarps, crooked trees, and landslide generated debris piles) within the treatment area, as documented by a field reconnaissance.	FEIS	Pg. 5.3-9
Public Services, Utilities, and Recreation	During project implementation	All subapplicants	The subapplicants will follow procedures listed in the FEIS (including Appendix F) for public notification and education, including posting the timing, location, and approximate amounts and types of pesticides or other chemicals to be applied at least 24 hours in advance. Trails and campgrounds will be closed prior to vegetation management activities. Offsite residents and recreational visitors will not have access to areas during and after treatment. Trails and campgrounds and other public use areas will be re-opened when safety risks no longer exist.	FEIS	Pg. 5.10-14
Historic Properties	During project implementation	All subapplicants	During ground disturbing activities (e.g., construction of temporary access roads) the subapplicants will employ a cultural resource monitor to check for the presence of any artifact or burial. The monitor will notify the sub-applicant for next steps if any item is encountered.	FEIS	Pg. 5.7-5
Historic Properties	During project implementation	EBRPD (HMGP 1731-16-34)	EBRPD's BMPs listed in its 2009 Wildfire Hazard Reduction and Resource Management Plan (WRRMP) will be implemented to ensure avoidance of adverse effects to cultural resources.	FES	Pg. 5.7-5

Resource Area	Timing of Implementation	Subapplicant	Mitigation Measures	Source Document	Page
Transportation	During project implementation	All subapplicants	Adequate warnings to motorists, pedestrians, and bicycle riders must be provided whenever a road or trail is blocked, partially blocked, or closed. It is expected that flag control warning crews will be used whenever trucks enter or exit public roadways onto adjacent fire trails and landings, large pieces of debris nearby will potentially affect the roadway, or equipment is placed at the project area sites.	FEIS	Pg. 5.13-10
Public Services, Utilities, and Recreation	During project implementation	UC Berkeley (PDM-PJ-09-CA-2005-03 and PDM-PJ-09-CA-2005-011)	The Upper Jordan Fire Trail, an unimproved road on University of California, Berkeley (UCB) land for pedestrian and emergency vehicle use, would be closed to the public as necessary during logging.	USFWS Biological Opinion	Pg. 11
Public Services, Utilities, and Recreation	During project implementation	UC Berkeley (PDM-PJ-09-CA-2005-03 and PDM-PJ-09-CA-2005-011)	UCB would coordinate with local fire departments to permit emergency access or alternative access to the land served, as needed.	USFWS Biological Opinion	Pg. 11
Noise	During project implementation	All subapplicants	Each sub-applicant will develop a noise control plan for its portion of the proposed and connected actions. The noise control plan will identify procedures for predicting construction noise levels at sensitive receptors prior to beginning work and will describe noise reduction measures required to reduce the increased noise levels to the maximum extent possible. Noise mitigation measures will include but will not be limited to the following: - Equipment will be maintained to reduce noise levels to the maximum extent possible (e.g., exhaust mufflers). - Hours of work will be limited to 7:00 a.m. to 7:00 p.m. Monday through Friday and 8:00 a.m. to 5:00 p.m. on Saturday. No work will be completed on Sunday. - Noise complaints will be addressed promptly by the subapplicant and alternate means of project implementation used when feasible.	FEIS	Pg. 5.14-5
Air Quality	Prior to project implementation	EBRPD (HMGP 1731-16-34)	At least 30 days before any proposed burning, EBRPD must prepare a smoke management plan and submit it to Bay Area Air Quality Management District (BAAQMD) for review (regulation 5-408.1). The plan must be consistent with EPA's Interim Air Quality Policy on Wildland and Prescribed Fires and must comply with other requirements listed in the BAAQMD regulation.	FEIS	Pg. 4.3-2
Air Quality	During project implementation	All subapplicants	All burning will be performed in conformance with Bay Area Air Quality Management District rules and regulations including "Burn Day" requirements.	FEIS	Pg. 5.5-11
Air Quality	Prior to project implementation	All subapplicants	To reduce public exposure to smoke, the subapplicants would follow Smoke Management Guidelines for Agricultural and Prescribed Burning per Title 17 of the California Code of Regulations Subchapter 2. These guidelines include procedures for public notification and education, such as providing press releases to local media to inform the public of the prescribed burn, posting appropriate signage at burn sites (at a minimum, along highways and major roadways in advance of areas where smoke would be visible or could potentially pose a visibility concern), and providing a means by which the public can report smoke complaints. Adherence to these guidelines would reduce public exposure to smoke.	FEIS	Pg. 5.10-5
Air Quality	Prior to project implementation	EBRPD (HMGP 1731-16-34)	The subapplicants would include in their smoke management plans the requirements for regularly scheduled trained patrols to monitor the highways and major roadways during both daylight and nighttime hours for potential visibility issues during and following prescribed burn periods. The workers conducting the burn would also have an escape fire contingency plan that would identify suppression actions that should be applied if one or more of the following conditions exist: People, facilities, or personal property are threatened by the prescribed fire; fire threatens to spread beyond prescribed boundaries; the burn is of a higher intensity than desirable and/or would result in unacceptable tree mortality, scorch, or other resource damages; smoke poses an unacceptable hazard or nuisance.	FEIS	Pg. 5.10-5
Biological Resources	After project implementation	EBRPD (HMGP 1731-16-34)	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.	USFWS Biological Opinion	Pg. 19
Biological Resources	Prior to project implementation	All subapplicants	Subapplicants will 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.	USFWS Biological Opinion	Pg. 136

Resource Area	Timing of Implementation	Subapplicant	Mitigation Measures	Source Document	Page
Biological Resources	During project implementation	All subapplicants	Subapplicants will 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.	USFWS Biological Opinion	Pg. 136
Biological Resources	During project implementation	All subapplicants	Subapplicants will encourage or require the use of appropriate California native species in revegetation and habitat enhancement efforts.	USFWS Biological Opinion	Pg. 136
Biological Resources	During project implementation	All subapplicants	Subapplicants will 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.	USFWS Biological Opinion	Pg. 136
Biological Resources	During project implementation	All subapplicants	Subapplicants will manage scrub, grassland, and oak woodland habitats for the benefit of the Alameda whipsnake.	USFWS Biological Opinion	Pg. 137
Biological Resources	During project implementation	EBRPD (HMGP 1731-16-34)	EBRPD will re-route trails away from suitable Alameda whipsnake and pallid manzanita habitat.	USFWS Biological Opinion	Pg. 137
Biological Resources	During project implementation	City of Oakland (PDM-PJ-09-CA-2006-0004)	Oakland will develop and implement a USFWS-approved long-term management plan for the pallid manzanita similar to the one being developed by EBRPD.	USFWS Biological Opinion	Pg. 137
Biological Resources	After project implementation	EBRPD (HMGP 1731-16-34)	EBRPD will coordinate with the USFWS on the Pallid Manzanita Management Plan, which will include requirements for EBRPD to acquire, preserve, and manage lands containing the pallid manzanita that are currently unprotected on private lands. EBRPD will educate and work with adjacent landowners to minimize the potential for the introduction and spread of P. cinnamomi into areas containing the pallid manzanita.	USFWS Biological Opinion	Pg. 137
Biological Resources	During project implementation	City of Oakland (PDM-PJ-09-CA-2006-0004)	City of Oakland will provide documentation of its outreach to 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).	USFWS Biological Opinion	Pg. 137
Biological Resources	During project implementation	City of Oakland (PDM-PJ-09-CA-2006-0004)	City of Oakland will 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).	USFWS Biological Opinion	Pg. 137
Biological Resources	During project implementation	City of Oakland (PDM-PJ-09-CA-2006-0004)	City of Oakland will provide documentation of its outreach to 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.	USFWS Biological Opinion	Pg. 137
Biological Resources	Prior to project implementation	EBRPD (HMGP 1731-16-34)	Pallid Manzanita Management Plan: Prior to implementing any activity within any recommended treatment areas (RTAs) containing pallid manzanitas, EBRPD will develop a USFWS-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). 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.	USFWS Biological Opinion	Pg. 56
Biological Resources	Prior, during, and after project implementation	UC Berkeley (PDM-PJ-09-CA-2005-03 and PDM-PJ-09-CA-2005-011)	University of California, Berkeley (UCB) will create at least 167 acres of suitable habitat for the Alameda whipsnake, consisting of at least 32 acres of core scrub habitat. This requirement will be achieved over the project's 10-year life span.	USFWS Biological Opinion	Pg. 135
Biological Resources	Prior, during, and after project implementation	City of Oakland (PDM-PJ-09-CA-2006-0004)	The City of Oakland will create at least 40 acres of suitable habitat for the Alameda whipsnake, consisting of at least 18 acres of core scrub habitat. This requirement will be achieved over the project's 10-year life span.	USFWS Biological Opinion	Pg. 135

Resource Area	Timing of Implementation	Subapplicant	Mitigation Measures	Source Document	Page
Biological Resources	Prior, during, and after project implementation	EBRPD (HMGP 1731-16-34)	EBRPD will create at least 62 acres of suitable habitat for the Alameda whipsnake. This requirement is dependent on the implementation of both the proposed and connected actions over the project's 10-year life span. If EBRPD does not remove as much eucalyptus as planned, then the amount of suitable habitat that needs to be created will be adjusted proportionally.	USFWS Biological Opinion	Pg. 135
Biological Resources	During project implementation	EBRPD (HMGP 1731-16-34)	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 USFWS-approved location(s) within its designated critical habitat. EBRPD will record the conservation easement within 9 months of EBRPD initiating the proposed project. The long-term endowment funding for the compensation areas will be in place within 9 months of EBRPD initiating the proposed project. The preserved habitat will be managed for the benefit of the Alameda whipsnake under a USFWS-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.	USFWS Biological Opinion	Pg. 135
Biological Resources	Prior, during, and after project implementation	All subapplicants	Each subapplicant will prepare and submit Mitigation and Monitoring Plans (MMPs) to Cal OES, for its submittal to FEMA and the USFWS. No work shall commence until the MMPs are approved by both FEMA and the USFWS. The MMPS will include, but are not limited to, the applicable measures listed herein.		
Biological Resources	Prior to project implementation	All subapplicants	Each applicant will have a final USFWS-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. Cal OES shall ensure that the applicants develop and implement USFWS-approved contingency plans in case the interim and final success criteria are not achieved.	USFWS Biological Opinion	Pg. 135
Biological Resources	During project implementation	All subapplicants	The U.S. Fish and Wildlife Service (USFWS) and FEMA 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 USFWS-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 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.	USFWS Biological Opinion	Pg. 136
Biological Resources	After project implementation	All subapplicants	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.	USFWS Biological Opinion	Pg. 136
Biological Resources	Prior to project implementation	All subapplicants	USFWS-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 will 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 will be determined annually through an analysis of data collection and review of photographic documentation. Treatment areas may be assessed individually, and adaptive measures will 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).	USFWS Biological Opinion	Pg. 47

Resource Area	Timing of Implementation	Subapplicant	Mitigation Measures	Source Document	Page
Biological Resources	After project implementation	All subapplicants	The MMPs will include monitoring of vegetation management goals through assessing the succession of vegetation within each habitat type throughout the 10-year timeframe of the project. The MMPs include the goal of protecting and promoting native vegetation communities while reducing wildfire risk. Success criteria include requirements for achieving a minimum percent cover of plant species to support native vegetation communities and habitats. Monitoring will be conducted annually for 10 years, and the results will be addressed in an annual report submitted to appropriate agencies, including USFWS, by March 31 of each year. The reports will include a summary of the maintenance and monitoring activities, recovery, percent cover of federally listed species habitat, measures implemented at each 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 will also include incidental observations of wildlife, comparative photos of the sites, assessment of vegetation criteria attained, and suggestions for future adaptive management. Photographic documentation will be conducted before and after implementation using established photo point stations and camera angles.	FEIS	Pg. 5.1-8
Biological Resources	After project implementation	All subapplicants	Through pre- and post-assessment surveys, each area will be inspected for evidence of severe erosion as a result of vegetation management. The survey will record the conditions on site and monitor the recruitment of native vegetation into the areas where trees have been removed, and the information will then be used to develop any amendments to the prescription for the treatment area, if needed. This will include actions to mitigate potential negative impacts from erosion. The post-assessment survey will be done annually for the first 10 years. The resulting survey information will then be used to modify, if needed, the maintenance and treatment methods to correct any potential negative outcomes, such as erosion, and to achieve the vegetation goals. In the event that natural recruitment does not occur as anticipated, additional introduction of native plant species will be implemented. Species introduced will include an assemblage of woody shrubs, forbs, and tree seedlings expected to thrive in the newly opened canopies. If severe erosion is occurring at a site, only native plant seeds or stock shall be used for erosion control, unless otherwise approved by USFWS. If necessary, fencing; signs; maintenance; access control; jute fabric; sediment traps; mulch; straw wattles (without plastic monofilament netting); biodegradable measures such as waddles, Curlex® erosion blankets, and chips; vegetation management; exotic species control; or any other commonly used erosion control technique may be used to promote the ecological health of the sites.	FEIS	Pg. 5.4-11
Biological Resources	After project implementation	All subapplicants	If success criteria set forth in the MMPs are not being achieved at the projected rate based on data collected during monitoring, adaptive management practices and additional measures will be implemented to improve progress toward the vegetation management goals. This could include more frequent maintenance projects, new methods or techniques for control of non-native and/or invasive plants, and higher performance objectives for successive years.	FEIS	Pg. 5.1-3
	During project implementation	All subapplicants	The frequency of maintenance and follow up treatment will depend on the effectiveness of the initial treatment. For long-term maintenance, sprouts from stumps will be treated annually. Up to twice a year, herbicides will be applied with a hand-sprayer on leaves or by cutting sprouts and hand-spraying the cut stubble. As during the initial treatment, herbicide application will be conducted in accordance with the instructions on the product label, guidance from the California Department of Pesticide Regulation, and the conditions on herbicide application developed through consultation on listed species.	FEIS	Pg. 3-11
Biological Resources	After project implementation	All subapplicants	Ongoing maintenance activities following tree removal will include herbicide treatment of sprouts emerging from stumps or foliage and the removal of eucalyptus seedlings to prevent recolonization of treated sites.	FEIS	Pg. 3-12
Biological Resources	After project implementation	All subapplicants	At the conclusion of the 10-year timeframe of the project, ongoing maintenance activities by the subapplicants will include the annual removal of grass and light fuels (such as twigs, needles, and grasses that ignite and burn rapidly) from roadsides, turnouts, and within 100 feet of structures and adjacent private residences.	FEIS	Pg. 3-12
Biological Resources	After project implementation	UC Berkeley (PDM-PJ-09-CA-2005-03 and PDM-PJ-09-CA-2005-011)	The monitoring plan for the UCB portion of the project implementation will be conducted at least two times per year for 10 years. The protocol for monitoring will 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 will 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. 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.	USFWS Biological Opinion	Pg. 9

Resource Area	Timing of Implementation	Subapplicant	Mitigation Measures	Source Document	Page
Biological Resources	After project implementation	UC Berkeley (PDM-PJ-09-CA-2005-03 and PDM-PJ-09-CA-2005-011)	The Draft UCB MMP provides interim and long-term success criteria for 10 years for Claremont Canyon, Strawberry Canyon, and Frowning Ridge. Acreage criteria are established for both native and exotic vegetation within each vegetation community to be evaluated at the end of the permit compliance monitoring period. The Draft UCB MMP will be revised to be consistent with the unified methodology, which would be applied in portions of two areas, Strawberry Canyon and Claremont Canyon. Of the approximately 36 acres of eucalyptus and fire-prone coniferous forest cover in the Strawberry Canyon project area, about 6 acres would remain during the 10-year project timeframe. Of the approximately 34 acres of eucalyptus and fire-prone coniferous forest cover in the Claremont Canyon project area, about 3 acres would remain during the 10-year project timeframe. Based on the results of monitoring for accumulation of fuel volume and potential for torching to occur, additional trees may be removed based on an assessment to be made 5 years after the initial implementation of treatment activities.	FEIS	Pg. 5.1-6
Biological Resources	After project implementation	UC Berkeley (PDM-PJ-09-CA-2005-03 and PDM-PJ-09-CA-2005-011)	The overall vegetation recruitment and retention goal for native plants is between 70 and 90%, depending upon location and floral community type. The Draft UCB MMP states that success will be achieved if the “native” metrics are attained or exceeded. Therefore, the overall goal is defined as achieving the projected “native/exotic” ratios rather than assuring that succession is proceeding fast enough given uncertainties, such as weather, climate change, pest infestation, diseases, and fires. Should success criteria not be met, maintenance measures may be implemented more frequently or by use of different maintenance approaches, substituting new methods for those that do not demonstrate adequate efficacy. Coppiced (re-sprouted) stumps may be treated with differing methods until 100% mortality is achieved. The latent seed stock is expected to require between 5 and 10 years of continuous treatment to ensure that any naturally germinating exotic trees are removed. Seeds that are carried onto the project areas from adjacent areas (typically upslope) would require treatment until all possible seed sources have been eliminated. In areas containing other exotic vegetation (e.g. broom) in exceedence of stated goals, the project manager would select from a suite of approaches to achieve annual metrics for each floral community. As unanticipated results are recorded (both positive and negative), these would further inform the project manager such that future maintenance either expands upon successful methods or discontinues those methods found to be unsuitable or ineffective. This process of adaptive management would be employed throughout the project life-cycle.	FEIS	Pg. 5.1-7
All	After project implementation	UC Berkeley (PDM-PJ-09-CA-2005-03 and PDM-PJ-09-CA-2005-011)	Based on the results of monitoring for accumulation of fuel volume and potential for torching to occur, additional trees would be removed based on an assessment to be made 5 years after the initial implementation of treatment activities. Progress toward meeting the goals for fire hazard reduction and habitat creation for listed species would be evaluated and treatment efforts may be adjusted accordingly.	FEIS	Pg. 3-24
Biological Resources	After project implementation	City of Oakland (PDM-PJ-09-CA-2006-0004)	The progress of the project implementation will be monitored at least one time per year for 10 years. The protocol for monitoring will involve Oakland’s project representative or his/her designee and/or USFWS- 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 will include an assessment of the natural recruitment and expansion of native floral communities in relation to the vegetation management goals and will be timed to coincide with the optimal periods for identification of performance metrics (Oakland 2013). Monitoring will include photographic documentation at the macro level for each project site and habitat type. Photographs will be taken within the project area to capture floral composition and monitor the success of the vegetation goals (Oakland 2013).	USFWS Biological Opinion	Pg. 14
Biological Resources	After project implementation	City of Oakland (PDM-PJ-09-CA-2006-0004)	While vegetation management is driven by the need for reduction of fire hazard, the long range goal of the City of Oakland MMP is to remove French broom, eucalyptus, and Monterey pines. The performance target for noxious, invasive plants will be less than or equal to 40% in Year 1, decreasing in a general linear trend to less than or equal to 20% in Year 10. The Draft City of Oakland MMP will be revised to be consistent with the unified methodology. In both the North Hills-Skyline and Caldecott Tunnel Ballfields project areas, the eucalyptus canopy will be thinned over the first 5 years of the 10-year project timeline. Additional tree removal after Year 5 will be conducted in order to reach goals for fire hazard reduction and habitat creation for listed species. Of the approximately 10.5 acres of eucalyptus and fire-prone coniferous forest cover in the North Hills-Skyline project area, just under 2 acres will remain during the 10-year project timeframe. Of the approximately 22.5 acres of eucalyptus in the Caldecott Tunnel Ballfields project area, about 1 acre will remain during the 10-year project timeframe.	FEIS	Pg. 5.1-5
Biological Resources	During project implementation	City of Oakland (PDM-PJ-09-CA-2006-0004)	The City of Oakland will more aggressively remove invasive exotic species if the coverage is higher than allowed in the performance standards. Performance standards will be achieved through a combination of invasive plant control (to allow space and growing conditions for the establishment and growth of endemic native plants) and through the protection of endemic plants if invasive plant control is not adequate.	FEIS	Pg. 5.1-6

Resource Area	Timing of Implementation	Subapplicant	Mitigation Measures	Source Document	Page
Biological Resources	After project implementation	City of Oakland (PDM-PJ-09-CA-2006-0004)	The methods for measuring performance will include use of maps of existing vegetation, annual onsite monitoring, and aerial photographic measures in Years 3 and 7 to determine the coverage of vegetation types. If the vegetation cover does not meet the goals, actions will be taken to achieve the desired distribution of plants and species.	FEIS	Pg. 5.1-6
Biological Resources	After project implementation	City of Oakland (PDM-PJ-09-CA-2006-0004)	Non-native invasive plant cover will be calculated from the data collected from all sites. Areas with greater than 20% cover of non-native species considered by the California Invasive Plant Council to be moderately or highly invasive and those with red alerts will be mapped and reported annually. Maintenance activities to control non-native invasive species will be targeted in these areas. Each year, the acreage of mapped highly invasive and alert species will be compared. Additionally, project sites will be visually inspected in the spring with the prior year's non-native invasive species map. If a non-native invasive species population has rapidly spread or a new species has invaded, then maintenance activities likely will be required. The adaptive management process will use the same suite of management methods as used during the initial treatment to control non-native invasive plants.	FEIS	Pg. 5.1-6
Biological Resources	After project implementation	City of Oakland (PDM-PJ-09-CA-2006-0004)	If monitoring shows that deer browsing is retarding the establishment of trees and shrubs, then adaptive measures such as fencing of trees may be implemented.	FEIS	Pg. 5.1-3
Biological Resources	After project implementation	EBRPD (HMGP 1731-16-34)	Following initial fuels treatment, monitoring, maintenance and reporting will occur on an appropriate schedule for the ongoing achievement of vegetation management goals. Post-treatment monitoring will 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 will 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 will 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 will be monitored over a 10-year monitoring period will be determined by specific site conditions after treatment and in accordance to an adaptive management process. Proposed frequency schedule will 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 will be included in a WHRRMP database for future reference and development of adaptive management strategies.	USFWS Biological Opinion	Pg. 19

Resource Area	Timing of Implementation	Subapplicant	Best Management Practices (BMPs)	Source Document	Page
Biological Resources	During project implementation	All subapplicants	Stumps will be cut to no more than 4 inches above ground and should be cleanly cut.	Appendix F	Pg. F-10
Water Resources	During project implementation	All subapplicants	To prevent drift, wind must be less than 3 to 5 mph (depending on technique) and temperature lower than 80° Fahrenheit for foliar application of herbicides or other spray application methods; use nozzles and pressures to avoid fine particles and use proper spraying technique.	Appendix F	Pg. F-10
Human Health and Safety	During project implementation	All subapplicants	Subapplicants will ensure herbicide applications are performed by licensed or certified operators registered with the applicable County (ies).	Appendix F	Pg. F-10
Human Health and Safety	During project implementation	All subapplicants	Herbicide operators must maintain calibrated equipment.	Appendix F	Pg. F-10
Biological Resources	During project implementation	All subapplicants	Subapplicants will ensure that herbicide operators record in writing the herbicide treatment data and report to the applicable County(ies).	Appendix F	Pg. F-10
Biological Resources	During project implementation	EBRPD (HMGP 1731-16-34)	EBRPD's Integrated Pest Management (IPM) specialists will oversee herbicide application on treatments within the EBRPD jurisdiction.	Appendix F	Pg. F-10
Biological Resources	During project implementation	All subapplicants	An IPM specialist will review herbicide application data to ensure minimum amounts used to achieve desired results.	Appendix F	Pg. F-10
Human Health and Safety	During project implementation	All subapplicants	Pesticide applicators are required to use formulated pesticide products in accordance with the product label, as approved by the EPA. The product label includes requirements for the use of personal protective equipment (PPE) for the individuals mixing and applying the formulations, for containing the material, for proper application, and for safe disposal of any material that is not applied. The project supervisor must have the authority to start and stop the pesticide application and be well versed in the State regulatory requirements regarding safe and legal use of the pesticide product, and applicator and public safety. Finally, all personnel involved with the pesticide application must receive safety training specific to the formulated pesticide product that will be used and must follow the site safety and health plan developed for the project that will prevent exposure to proposed pesticide formulations and other formulation constituents at concentrations that could be expected to affect health.	Appendix F	Pg. F-10
Human Health and Safety	During project implementation	All subapplicants	BMPs include entry restrictions that are designed to protect people from being exposed to dangerous levels of pesticides left on treated surfaces. An entry restriction rule-of-thumb for all products is until sprays have dried, dusts have settled or vapors dispersed. Product labels state the specific entry restrictions. Product labels will also state that early reentry (entering a treated area before the entry restriction has expired) can only be done by personnel wearing specific protective clothing. The Worker Protection Standard (WPS) established Restricted Entry Intervals (REI) for pesticides used to produce agricultural plants. The REI is a period of time after and application of a pesticide that worker entry to the treated area is restricted. These REIs are based on the acute dermal toxicity of the active ingredient, eye irritation effects or skin irritation effects. If workers must enter the sprayed area within the REI, then those workers will need to wear the required Personal Protective Equipment that is noted on the pesticide label.	Appendix F	Pg. F-83
Biological Resources	During project implementation	All subapplicants	Hydroseeding will 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 will be used to assist in the recovery of the areas toward the proposed vegetative goals.	FEIS	Pg. 5.1-5
Biological Resources	During project implementation	All subapplicants	When herbicides are needed for vegetation control, BMPs call for direct application to the plant or tree either by hand painting the herbicide directly on to the cambium of the freshly cut tree or plant stump or bottle spritzing, no further than 6 inches away, onto freshly cut pampas grass clumps. In order to apply the herbicide to the stump or grass clump, all of the plant or tree's foliage (leaves, branches, trunks) must be hand or mechanically cut away until nothing is left but a stump or clump.	FEIS	Pg. 4.5-18
Biological Resources	During project implementation	All subapplicants	The frequency of maintenance and follow up treatment will depend on the effectiveness of the initial treatment. For long-term maintenance, sprouts from stumps will be treated annually. Up to twice a year, herbicides will be applied with a hand-sprayer on leaves or by cutting sprouts and hand-spraying the cut stubble. As during the initial treatment, herbicide application will be conducted in accordance with the instructions on the product label, guidance from the CDPR, and the conditions on herbicide application developed through consultation on listed species.	FEIS	Pg. 3-11
Human Health and Safety	During project implementation	City of Oakland (PDM-PJ-09-CA-2006-0004)	In accordance with the City of Oakland's Integrated Pest Management (IPM) policy and BMPs, the choice of formulation for each type of application will be determined basted on the environmental factors as well as the product's capabilities. Glyphosate and triclopyr will only be used when conditions and best management practices demonstrate that a chemical treatment will be the most effective approach and will only be applied to the list of plants previously identified in the Final Environmental Impact Statement (FEIS) and those new non-native plants that may be identified in the Wildfire Prevention Assessment District's yearly report.	FEIS	Pg. 4.5-19
Biological Resources	During project implementation	All subapplicants	If Sudden Oak Death (SOD) is present in a portion of a treatment area (a) schedule all landscaping and construction operations to occur first in the SOD-free area and utilize paved and rocked roads and landings to the extent possible; (b) inform personnel that they are working in an area with SOD disease, unauthorized movement of plant material is prohibited, and the intent of mitigation measures is to prevent disease spread; (c) ensure equipment and personnel shoes and boots are cleaned prior to leaving the site after work in the SOD-infested area.	FEIS	Pg. 5.1-34
Biological Resources	During project implementation	All subapplicants	To limit spread of SOD, Subapplicants will conduct operations during the dry season and utilize paved and rocked roads and landings to the extent possible.	FEIS	Pg. 5.1-34
Biological Resources	During project implementation	All subapplicants	If property is downwind and down slope from a dense mixed forest with significant SOD infestation, Sub-applicant will ensure that water runoff is properly channeled to avoid spread of the disease by water.	FEIS	Pg. 5.1-34
Biological Resources	During project implementation	All subapplicants	To control SOD, bay laurels need to be treated with systemic herbicides at least a couple of weeks before being cut down to minimize re-sprouting. Bays within 10 feet of oak canopies will be cut to help prevent the spread of SOD.	FEIS	Pg. 5.1-34

Resource Area	Timing of Implementation	Subapplicant	Best Management Practices (BMPs)	Source Document	Page
Biological Resources	During project implementation	All subapplicants	Subapplicants will attempt to eliminate the pathogen in plants killed or infected by the disease by following these guidelines: a. Bay and tanoak leaves on the ground will be less conducive to the pathogen than on the tree; thus, simply removing infected foliage and small twigs and mixing them in the top layer of the soil may be beneficial. b. Composting following EPA guidelines will effectively kill the pathogen. c. For infected wood, it is best to cut the wood in small logs and allow it to dry without tarping in a sun-exposed and breezy area not far from where the tree was standing. d. Chipping is effective as long as chips are broadcasted only locally near the area where the tree was growing in a thin layer exposed to sunlight. e. Burning infected wood is very effective, but do not move firewood from the property where the tree was growing.	FEIS	Pg. 5.2-35
Human Health and Safety	Prior to project implementation	All subapplicants	All vegetation management workers will be provided with training and oversight to ensure they are familiar with safety requirements, equipment use, and site-specific conditions, including topography. They will be taught proper procedures for handling fuels and lubricants so that spilling and runoff of these substances does not occur. In addition, they will be required to use Occupational Safety and Health Administration (OSHA)-compliant equipment, including personal protection equipment and hand tools. All project activities will be conducted in compliance with state and federal OSHA standards.	FEIS	Pg. 5.10-2
Air Quality	During project implementation	All subapplicants	Watering of the construction site would be conducted twice per day during access road construction on the sites requiring new or repaired access roads.	FEIS	Pg. 5.5-11
Water Resources	During project implementation	UC Berkeley (PDM-PJ-09-CA-2005-03 and PDM-PJ-09-CA-2005-011)	UCB will comply with the 2020 Hill Area Fire Fuel Management Program (HAFFMP), which includes UCB's fuel management and treatment techniques and associated best management activities or mitigation measures to reduce the effects of erosion that could impact water quality.	FEIS	Pg. 4.5-17
Water Resources	During project implementation	All subapplicants	Stormwater runoff will be collected with drains to avoid the formation of rills and gullies.	NMFS NLAA Concurrence	Pg. 5
Geology, Seismicity, and Soils	During project implementation	All subapplicants	Soil erosion will be minimized by retaining stumps and root masses when possible until vegetation becomes re-established in logged areas, or through the placement of wood chips and cut vegetation on the ground over bare soils.	NMFS NLAA Concurrence	Pg. 4
Water Resources	During project implementation	All subapplicants	In Wildcat and San Leandro creeks, herbicide treatments will be limited to vegetation in areas at least 300 feet from the stream.	NMFS NLAA Concurrence	Pg. 5
Biological Resources	During project implementation	All subapplicants	The applicants will use existing strategic fire roads to the maximum extent possible. Some temporary access routes and skid trails will be needed and will be anticipated to return to existing conditions within one year. The access routes will avoid scrub habitat, primary constituent elements for the designated critical habitat of the Alameda whipsnake, and stream and riparian habitats. New skid trails will be on firm, well-drained soils, and grades will typically be less than 15 percent. Where steep grades are unavoidable, grade breaking techniques and soil-stabilization practices will be implemented. Temporary access routes may be constructed to extract downed materials. Detailed locations of skid directions and skid landings are available only for East Bay Regional Park District's (EPRPD) Claremont Canyon treatment area. Most of the work in other park areas will be conducted from existing roads and access points.	USFWS Biological Opinion	Pg. 44
Biological Resources	During project implementation	All subapplicants	All material stockpiling and staging areas will be located within designated disturbed/developed areas that are outside of sensitive habitat areas as determined by the U.S. Fish and Wildlife Service (USFWS) - and/or the National Marine Fisheries Service (NMFS)-approved biological monitor(s) and/or the USFWS/NMFS.	USFWS Biological Opinion	Pg. 45
Biological Resources	During project implementation	All subapplicants	Project-related vehicles will 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 will be prohibited.	USFWS Biological Opinion	Pg. 45
Biological Resources	During project implementation	All subapplicants	To avoid and/or minimize attracting predators to the site, all food-related trash items, such as wrappers, cans, bottles, and food scraps will be disposed of in a securely covered container. These containers will be emptied, and debris removed from the project site at the end of each working day.	USFWS Biological Opinion	Pg. 45
Biological Resources	During project implementation	All subapplicants	The spread or introduction of exotic plant species will be reduced by minimizing soil disturbance to areas during and following fuel reduction treatments. Additionally, each area will 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 USFWS. 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.	USFWS Biological Opinion	Pg. 45
Water Resources	Prior to project implementation	All subapplicants	Subapplicants will install storm drain protection prior to vegetation management for project sites near storm drains.	USFWS Biological Opinion	Pg. 45
Biological Resources	During project implementation	All subapplicants	Subapplicants will place a deep bed of chips around tree stumps to allow mechanical skidders to travel above the chip bed.	USFWS Biological Opinion	Pg. 45
Biological Resources	During project implementation	All subapplicants	Subapplicants will use chipped biomass, whole boles retained behind stumps, to create sediment traps roughly following the slope contours.	USFWS Biological Opinion	Pg. 45
Geology, Seismicity, and Soils	During project implementation	All subapplicants	Subapplicants will avoid operation of heavy equipment on slopes steeper than 35 percent, and develop specific measures to minimize effects of erosion if such areas are unavoidable.	USFWS Biological Opinion	Pg. 46
Water Resources	During project implementation	All subapplicants	Subapplicants will stabilize all construction entrances and exits to control erosion and sediment discharges from the sites.	USFWS Biological Opinion	Pg. 46
Water Resources	During project implementation	All subapplicants	Subapplicants will clean and maintain 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.	USFWS Biological Opinion	Pg. 46

Resource Area	Timing of Implementation	Subapplicant	Best Management Practices (BMPs)	Source Document	Page
Biological Resources	Prior to project implementation	All subapplicants	Subapplicants will select mechanical treatments according to a site's topography, access, vegetation type, and potential for environmental impacts.	USFWS Biological Opinion	Pg. 46
Biological Resources	During project implementation	All subapplicants	Vehicle and heavy equipment refueling and maintenance will only be permitted in designated disturbed/developed areas where accidental spills can be immediately contained.	USFWS Biological Opinion	Pg. 46
Biological Resources	During project implementation	All subapplicants	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.	USFWS Biological Opinion	Pg. 46
Water Resources	During project implementation	All subapplicants	Storage of hazardous materials and equipment shall not occur within 500 feet of any pond or creek drainage.	USFWS Biological Opinion	Pg. 46
Biological Resources	Prior to project implementation	All subapplicants	Subapplicants will prepare a plan for immediate containment and clean-up of hazardous material spills within or adjacent to each site.	USFWS Biological Opinion	Pg. 46
Water Resources	During project implementation	All subapplicants	Subapplicants will avoid crossing drainage areas with running or standing water with mechanical equipment while water is present.	USFWS Biological Opinion	Pg. 46
Water Resources	Prior to project implementation	All subapplicants	Subapplicants will comply with National Pollutant Discharge Elimination System (NPDES) stormwater permitting requirements and prepare Stormwater Pollution Prevention Plans (SWPPP).	USFWS Biological Opinion	Pg. 46
Water Resources	During project implementation	All subapplicants	Subapplicants will use hand-fellers for trees within 50 feet of a drainage channel; these trees will be felled perpendicular to the ephemeral drainage, and processing will be done by a skidder, if the skidder could safely handle stems at a 50-foot distance from drainage, otherwise, the trees will be lopped and scattered by hand fellers. No mechanized equipment is intended to be used for either removal or mastication in this 50-foot buffer.	USFWS Biological Opinion	Pg. 46
Water Resources	During project implementation	All subapplicants	Subapplicants will locate landings to accommodate skidding distances of up to 1,000 feet; for landings near streams, residue piles (sawdust, field chipping, residue, etc.) will be placed away from drainages where runoff may wash residue into streams or wetlands.	USFWS Biological Opinion	Pg. 46
Water Resources	During project implementation	All subapplicants	Subapplicants will avoid 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.	USFWS Biological Opinion	Pg. 47
Water Resources	During project implementation	All subapplicants	Subapplicants will take all necessary safeguards to prevent sedimentation into watercourses during all phases of construction.	USFWS Biological Opinion	Pg. 47
Water Resources	During project implementation	All subapplicants	Subapplicants will avoid operating mechanical equipment within the stream buffer zone and where such impact is unavoidable, employing standard Best Management Practices (BMPs) to mitigate disturbance.	USFWS Biological Opinion	Pg. 47
Water Resources	During project implementation	All subapplicants	The areas chemically treated with herbicide will include areas up to the ordinary high water mark of ephemeral streams. However, a 60-foot buffer zone adjacent to standing or flowing water will be established within which there will 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 will be used (e.g., Garlon 3A, Stalker, and Roundup), and the more toxic Garlon 4 Ultra will not be used.	USFWS Biological Opinion	Pg. 50
Water Resources	During project implementation	UC Berkeley (PDM-PJ-09-CA-2005-03 and PDM-PJ-09-CA-2005-011)	The areas chemically treated will include areas up to the ordinary high water mark of ephemeral streams; however, no trees will be treated within 50 feet of standing or running water or within 24 hours of a rain event	USFWS Biological Opinion	Pg. 7
Biological Resources	During project implementation	All subapplicants	Herbicide will only be applied by hand during dry weather and low wind conditions, and a back sprayer will be used to selectively apply herbicide to the young foliage of re-sprouted eucalyptus.	USFWS Biological Opinion	Pg. 49
Water Resources	During project implementation	All subapplicants	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 will be conducted by a State of California Qualified Applicator or by staff under their supervision.	USFWS Biological Opinion	Pg. 48
Water Resources	During project implementation	All subapplicants	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.	USFWS Biological Opinion	Pg. 49
Biological Resources	During project implementation	All subapplicants	Chemical treatment shall be conducted in accordance with a USFWS- and NMFS- approved treatment plan.	USFWS Biological Opinion	Pg. 49
Human Health and Safety	During project implementation	All subapplicants	Subapplicants will ensure that contractors have all necessary licensing by California Department of Pesticide Regulation (CDPR) for herbicide application.	USFWS Biological Opinion	Pg. 49
Human Health and Safety	During project implementation	All subapplicants	Use of herbicides shall be consistent with label instructions and Material Safety Data Sheets documents shall be maintained.	USFWS Biological Opinion	Pg. 49
Biological Resources	During project implementation	All subapplicants	Subapplicants will 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.	USFWS Biological Opinion	Pg. 49
Biological Resources	During project implementation	All subapplicants	A liquid herbicide will 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.	USFWS Biological Opinion	Pg. 49
Biological Resources	During project implementation	All subapplicants	Herbicide applications will be rotated for best impact during the growing season. The lowest effective concentration needed for effectiveness will be used, typically specified as a range on the product label.	USFWS Biological Opinion	Pg. 50
Biological Resources	During project implementation	All subapplicants	No herbicides will be intentionally applied to non-target species.	USFWS Biological Opinion	Pg. 50

Resource Area	Timing of Implementation	Subapplicant	Best Management Practices (BMPs)	Source Document	Page
Human Health and Safety	During project implementation	All subapplicants	All herbicide containers will be labeled according to CDPR regulations.	USFWS Biological Opinion	Pg. 50
Human Health and Safety	During project implementation	All subapplicants	All herbicide containers will be disposed of according to CDPR regulations.	USFWS Biological Opinion	Pg. 50
Human Health and Safety	During project implementation	All subapplicants	All herbicide materials will be stored according to CDPR regulations.	USFWS Biological Opinion	Pg. 50
Biological Resources	During project implementation	All subapplicants	All herbicide materials used will be recorded and reported per CDPR regulations.	USFWS Biological Opinion	Pg. 50
Biological Resources	Prior to project implementation	All subapplicants	Subapplicants shall regularly consult the label instructions or CDPR website for a complete (and evolving) set of use guidelines and restrictions.	USFWS Biological Opinion	Pg. 50

Resource Area	Timing of Implementation	Subapplicant	Reporting Requirements	Source Document	Page
All	Prior, during, and after project implementation	All subapplicants	One paper and one electronic copy of all plans or submittals required in compliance with the Environmental and Historic Preservation review, including those summarized herein, shall be provided to FEMA RIX a minimum of 2 weeks prior to submittal to applicable agencies, to allow for FEMA review and coordination. This time line may be modified with written consent from FEMA RIX Regional Environmental Officer.	FEIS	Pg. 1-660 and all appendices
All	Prior, during, and after project implementation	All subapplicants	The subapplicants, in coordination with Cal OES, will complete all reporting required in compliance with the Environmental and Historic Preservation review, including those summarized herein. Unless otherwise stipulated in writing by FEMA, reports will be submitted directly to FEMA for its review prior to submittal to other applicable agencies. In January of each calendar year following project implementation, Cal OES will provide to FEMA an updated Mitigation Monitoring and Work Plan Summary. Each plan update should include at a minimum: 1) a statement of compliance with each commitment that was be implemented as part of this project (including applicable BMPs, Mitigation Measures, Terms and Conditions, Plans, and Reporting in the FEIS, BO, and NLAA documentation), 2) an updated schedule for submittal of anticipated required plans including identification of agencies that each plan will be submitted to, and 3) updated names and contact information for each person responsible for the respective commitment.		