Appendix A

Comment Letters Received on the Draft EIR

September 29, 2020

Raphael Breines, Senior Planner
U.C. Berkeley, Physical & Environmental Planning
300 A&E Building
Berkeley, CA 94720-1382
planning@berkeley.edu

VIA EMAIL

Subject: Support for UC Berkeley's Wildland Vegetative Fuel Management Plan

Dear Mr. Breines,

The East Bay Municipal Utility District supports the University of California, Berkeley's *Wildland Vegetative Fuel Management Plan (WVFMP), Draft Environmental Impact Report* and *Appendice*s.

The identified two fuel break projects, four temporary refuge areas, and three fire hazard reduction treatments, totaling approximately 600 acres, will expand efforts to reduce wildfire hazards in the East Bay. The projects' locations throughout the East Bay hills make them an important link in the chain of fuel reduction projects that protect not only the campus, but also the residents of Berkeley, the City of Oakland, East Bay Municipal Utility District's critical San Pablo watershed and East Bay Regional Park District's environmentally sensitive parklands. A1-1

We encourage the University of California to finalize the Draft EIR and begin implementation.

Sincerely,

Scott Hill

Scott Hill
Manger of Watershed & Recreation

SH:cl

Letter O1

8/31/20

Oakland Firesafe Council Response to UC Hill Campus Vegetation Management Plan

The Oakland Firesafe Council was created in 2014 to offer education, outreach and advocacy on wildfire prevention for not only the City of Oakland, but for high fire severity risk zones throughout Alameda County. As such we take a special interest in UC Berkeley's efforts to reduce the spread of wildfire because the successful implementation of such a program greatly impacts the safety of adjacent and nearby residential neighborhoods in the Berkeley/Oakland hills. O1-1

We agree with the Claremont Canyon Conservancy that the plan should spell out a comprehensive approach to vegetation management on the UC hill property and not be contingent on current available funding. Given the speed, severity and voracity of recent wildfires, a plan that only partially addresses the wildfire safety need will not keep people and property safe. O1-2

Additionally, given the many years of drought and the new reality of wind driven and lightning strike wildfires generating crown fires, the plan should be expanded to include efforts to prevent canopy fires on the Hill Campus. The alternative approach proposed by UC Forestry Professor Emeritus Joe McBride offers sound, scientifically-based recommendations. O1-3

And finally, the time frame for maintenance needs to be expanded so that the efforts to reduce the fuel load on the Hill Campus so that the vegetation doesn't resort to a high fuel load due to lack of attention. O1-4

We appreciate the fact that UC is committed to making its property more fire safe, for the work you do on your property has a major impact on nearby neighborhoods. O1-5

Letter
O2

9/3/20

500 Word Summary Response
by the Claremont Canyon Conservancy

The New Reality

The increased number and severity of wildfires in California over the past three years illustrates that we are in a new reality. Evacuation strategies are essential. The Hill Campus Plan makes evacuation routes safer.

The need for evacuation underscores the importance of preventing wildfires from starting. In our new reality much more vegetation management is required than the University plans. The Plan should be a prescription for what is needed. It should prioritize what work is funded under the CalFire grant and what will await additional resources. If a fire spreads from the Hill Campus to homes, businesses, and University facilities downwind, the damage and the liability to the University will be in the billions of dollars. The Plan must be a guide for the future, not simply for the grant. O2-1

Wind Speed

Wildfire wind speeds have been calculated at 60 to 100 miles per hour. Winds in the 1991 Tunnel Fire were clocked at 70 mph. Yet, the Plan states the rate of fire spread "is expected to be slow to moderate", 1.4 to 28 mph, or very strong winds at 40 mph. The plan should adopt a more realistic scenario. O2-2

Thinning and Canopies

The Plan details how thinning and removing the understory can prevent wildfires. However, in the new reality two sources of wildfire fuel must be considered. Removing the understory prevents only ground fires.

Thinning fails to address fires that start in canopies through wind driven embers. The Plan notes the potential for damage to campus facilities from canopy fires but does not discuss what may occur if fire spreads beyond the campus. O2-3

Canopies of the most flammable trees must be eliminated to prevent or at least reduce the likelihood of these fires. The 1991 Tunnel fire started locally on the ground but it was spread by wind driven embers from eucalyptus canopies. So, eliminating both ladder fuel and canopies is necessary in the new reality. While a case can be made that trees on ridgelines are the top priority, in the new reality all eucalyptus and pine trees should be removed from the Hill Campus.

Lightning

Lightning is another cause of wildfires that the Plan must address. Lightning strikes the canopies, creating another reason for canopy removal on a far wider scale than the Plan proposes. With climate change, we we dare not assume the 2020 lightning caused fires were a one-time occurrence. O2-4

Maintenance

The Plan suggests that maintenance will occur over a 10-year period. Based on the Conservancy's work in Claremont Canyon, 10 years is not sufficient. Today, 15 years following the removal of eucalyptus trees from Claremont Canyon and treating the stumps, we continue to find new eucalyptus sprouts. O2-5

If the Plan's prohibition on trail maintenance in Claremont Canyon would continue beyond the CalFire funding, the University should be prepared to explain itself to the many users of the trails and to state that it accepts liability if an accident happens.

Letter O3

9/12/20
From Maxina Ventura, Chronic Effects Researcher,
East Bay Pesticide Alert

Comments in Response to dEIR re: UC Vegetation Management's Deforestation and Pesticiding of the East Bay Hills

Every tree is a fire mitigation factor according to the experts who produce the National Fire Protection Association Handbook, found in every fire station.

David Maloney, Retired Oakland Fire Department; Chief, Fire Prevention, Oakland Army Base, appointed to 1991 Oakland-Berkeley Mayors' Task Force on Emergency Preparedness and Community Restoration to report on causes of the '91 East Bay Hills conflagration, and make recommendations for the future, referenced the NFPA:

"Dried grass provides the most flammable ground fuel," and, "There's no if's, and's, or but's.... every single tree is a wildfire mitigation factor.... trees block wind, drip fog onto grasses, and block sun so grasses stay moist."

On Angel Island deforestation resulting in 2008 catastrophe, he said:

<<
These are the same people and institutions that are advocating the removal of trees from the East Bay Hills, which will make the East Bay Hills become like the dry, flammable, grassy terrain in Lake County where large, destructive grass fires destroyed Middletown (summer, 2015). O3-1

>>

That was a human-made Climate Fire. Eucs were keeping soil moist, fire mitigation.

His 2016 EB Hills update, attached, and here: http://www.eastbaypesticidealert.org/wildfire.html

After UC's EB Hills clearcuts-to-grasslands early/mid-00's, we saw mudslides. Predictable. UC's plans to keep destroying Eucs and other tall trees adapted to our climate, is reckless.

Tall trees transpire significant water per year, and sequester carbon while giving off oxygen especially needed in the crowded Bay Area.

You must not use any pesticides, whether herbicides or others such as fungicides which have been weakening oaks, making them vulnerable to Sudden Oak Death. The fungicide use was UCB’s Garbaletto’s dangerous response to Sudden Oak Death which also was a manufactured climate catastrophe borne of drought conditions, particularly Wine Country over-use of water in conventional grape growing that was coming to a head in the mid-90’s in Sonoma. Around that ime Marin was hit, too, after which SOD followed wine grape growing regions and even moved nto citrus-growing regions across the state, and beyond. O3-2

Native, as people like to refer to Oaks, they are not able to survive our climate-changed environment and habitats. They’re expected to be all gone by about 20 years from now in the EB Hills, and would not be expected to fare much better in SF in these times. But Eucs thrive, as can Monterey Pines.

Stop the needless destruction of life-giving trees and toxic pesticide use in the hills, and in People’s Park, under continual UC attack. UC-educated USFS’s David Nowak is all over the news about the need for urban forests like this.

UC’s a leader of Climate Change. We respectfully request that UC stop the destruction of the EB Hills and Mt. Sutro, and replant at least 5 Eucalyptus trees for every tree you’ve destroyed on any UC land. We need their help. O3-3

Sincerely,

Maxina Ventura for East Bay Pesticide Alert

** Please confirm receipt

** You have my permission to read at the Monday 9/14 hearing. Please identify it as submitted by me on behalf of East Bay Pesticide Alert

Letter O4

HILLS EMERGENCY FORUM

September 14, 2020

Delivered via Email: planning@berkeley.edu
Subject: Draft EIR Comments: MVFMP.

UC Berkeley, Physical & Environmental Planning
Attention: Raphael Breines, Senior Planner
300 A&E Building
Berkeley, CA 94720-1382

Re: Support for University of California, Berkeley Wildland Vegetative Fuel Management Plan

Dear Mr. Breines:

The members of the Hills Emergency Forum Staff Liaison Committee support the University of California, Berkeley's *Wildland Vegetative Fuel Management Plan (WVFMP), Draft Environmental Impact Report* and *Appendices*.

The HEF was formed after the 1991 Tunnel Fire and continues to facilitate a cooperative approach among the nine governing organizations to address urban wildland interface issues in the Oakland Berkeley Hills. We support the four implementation treatment types and five vegetation treatment activities identified in the plan as compatible with our regional approach. Our member agencies look forward to collaborating with University of California, Berkeley during implementation of the nine identified treatment projects. The identified two fuel break projects, four temporary refuge areas, and three fire hazard reduction treatments, totaling approximately 600 acres, are critical. They will expand partner agencies' efforts to reduce wildfire hazards in the East Bay. The projects' locations make them an important link in the chain of fuel reduction projects throughout the East Bay hills protecting not only the campus, but also the residents of Berkeley, the City of Oakland, East Bay Municipal Utility District's critical San Pablo watershed and East Bay Regional Park Districts' environmentally sensitive parklands. O4-1

The members of the HEF Staff Liaison Committee support the WVFMP, and encourage the University of California to finalize the Draft EIR and begin implementation.

Sincerely,

David Brannigan, Fire Chief, City of Berkeley
Chair HEF SLC 2019-2020

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Letter O5

UC Berkeley Hills Campus Wildland Vegetative Fuel Management Environmental Impact Report - Public Comment

2 messages

SF Forest <sfforestnews@gmail.com> Mon, Sep 14, 2020 at 4:34 AM
To: planning@berkeley.edu

Dear UC Berkeley,

San Francisco Forest Alliance is a 501(c)4 not-for-profit organization with a mission of **inclusive environmentalism**. We fight to protect our environment through outreach and providing information. We oppose the unnecessary destruction of trees, oppose the use of toxic herbicides in parks and public lands, and support public access to our parks and conservation of our tree canopy. We stand for transparency in the use of public funds.

This is our public comment. UC Berkeley may read it aloud in public.

1) Tree removals will increase fire hazard because the vegetation that will grow instead will be grass and shrubs. These fine fuels dry out more rapidly, ignite much more easily, and result in fast-moving fires that change direction erratically, are difficult to contain, and threaten structures quickly. Forested lands retain moisture much longer than grass and shrub lands, and do not ignite as fast. Of course under the worst conditions, everything burns, but there is no reason to increase the risk by drying out the landscape further. **We oppose the removal of trees for this project.** O5-1

2) In the longer term, trees fight the global warming that is increasing the fire hazard in California year by year. Mature trees store more carbon, and also sequester more carbon each growing season than younger ones, and certainly more than grasses and shrubs. UC should not be contributing to global warming by cutting down trees, thus releasing the stored carbon and cutting off the potential for sequestration.

3) **We also oppose the use of toxic herbicides.** It has been shown that these pesticides are usually more dangerous than their manufacturers claim. They are also more mobile in the soil and more persistent. Nearly every water source on earth contains traces of pesticides. UC should not be contributing to creating toxic waste and potential health hazards from known and yet-to-be-known health impacts on people and animals. O5-2

We support the No Project Alternative. O5-3

Thank you,

San Francisco Forest Alliance

SF Forest <sfforestnews@gmail.com> Mon, Sep 14, 2020 at 1:25 PM
To: planning@berkeley.edu

Dear UC Berkeley,

San Francisco Forest Alliance would like to amend its comment to delete the final sentence. We do NOT support the No Project Alternative, which will continue the destruction of mature trees and the use of herbicides. We ask for UC to stop cutting down trees, and to stop using herbicides.

Thank you

San Francisco Forest Alliance
[Quoted text hidden]

Letter O6

TO: UC Berkeley, Physical & Environmental Planning
Attention: Raphael Breines, Senior Planner
300 A&E Building, Berkeley, CA 94720-1382

INTRODUCTION

The following comments are submitted by Jerry D. Kent, a Conservancy Board Member, on behalf of the Claremont Canyon Conservancy in response to the draft UC HILL WILDLAND VEGETATIVE FUEL MANAGEMENT PLAN/EIR (WVFMP/EIR. The Conservancy has been a strong supporter of University efforts to mitigate fire hazards on the Hill Campus since the 1991 fire. Including the significant fire hazard reduction improvements that were achieved by removing eucalyptus, pine, acacia, and other flammable planted and invasive vegetation between 2000 and 2007 in Claremont Canyon, at Chaparral Hill, and along the partial and uncompleted joint EBRPD and UC Grizzly Peak Boulevard Ridgetop Fuelbreak.

The Conservancy has been waiting 14 years, since fire hazard mitigation grants were awarded in 2006 for Claremont and Strawberry Canyon, and was disappointed by the disastrous FEMA EA and EIS process that otherwise would have resulted in fire mitigation projects being completed by now. We are also becoming impatient while seeing increasing fire damage throughout California occurring in the past five years, but are encouraged that the University will again begin significant fire mitigation work based on the “new fire reality” that demands a new comprehensive approach. While visiting Napa Valley and the Glass Fire on Thursday October 1, 2020 with Governor Newsom, Cal Fire Chief Porter was quoted as saying that it’s not just firefighters and more aircraft, it’s not just more fuels reduction project work, it’s not just defensible space or home hardening—it is absolutely every one of those things”. Porter also said “We need every piece of the system to be raised to meet the challenge that the changing climate is giving us and that California is going to be in the future”. The Conservancy supports the type of comprehensive approach described by Chief Porter for the East Bay Hills and for the UC Campus Hills. O6-1

A. However, we find that the current UC HILL WVFMP/EIR is not comprehensive, represents a significant change in policy, and that it is inadequate. The final draft did not fully respond to the highlighted issues submitted in the attached comments to the draft Plan and NOP. In fact, I can’t find any substantive changes in the draft Plan that modified the Cal Fire Grant project list or added other essential provisions as a result of comments made to the draft Plan. The draft Plan is also fragmented because it is based on unspecified ongoing projects funded by Cal Fire, and on a grant request for new projects using untested treatments for managing flammable vegetation on steep hillsides above dense urban development that is periodically subjected to Diablo winds. O6-2

The draft WVFMP/EIR is also faulty because its unstated purpose is to justify an incomplete list of Cal Fire funded grant projects that are based on biased and untested assumptions about thinning dense seedling and coppice eucalyptus forests instead of recommending converting to a lower growing native oak and bay woodland and native shrubland similar to what has already been done by UC above signpost #29 along the South side of Claremont Avenue, on Chapparal Hill, and along Frowning Ridge below Grizzly Peak Boulevard. (Attachment A- Unresolved comments (highlighted) submitted as a response to the draft Hill Campus Wildland Vegetative Fuel Management Plan) O6-3

The vegetation fuel management details and listed mitigation in the WVFMP will also not fulfill the stated objectives of the Project (objective numbers 1, 4, 5, 6, 8), and is crafted and analyzed as a political mid-option alternative that will not result in managed vegetation safe enough for agency firefighting to stop a Diablo Wind wildfire on steep hillsides before it spreads by flame or embers over fuelbreaks into the Campus, Panoramic Hill residential area, Claremont Canyon open space and residential areas, and other residential communities of Oakland and Berkeley. O6-4

To serve as a potential Program and Project EIR, the final UC Campus Hill WVFMP/EIR must result in a comprehensive Plan (that is not limited to the current Cal Fire grant) that will result in a change of the current Hill Campus Cal Fire Resource Assessment Program (FRAP) rating that is currently a Very High Fire Hazard Severity Zone status noted in Figure 3.12-1 to a post project Moderate Fire Hazard Severity Zone status. O6-5

Further, the UC Hills Campus should not be characterized or managed as a wildland. The UC Hills Campus is currently a collection of historic university and privately owned lands that is now a highly urbanized and already manipulated landscape on a very steep hillside that has not been adequately managed for 120 years. We are faced with increasingly dangerous global warming and 3.6 million acres burning in California while this WFVMP/EIR is being considered, and it's both a fire scientific and political reality that the Hill Campus must now be managed using specific vegetation prescriptions that will result in a fire-safe and manageable greenbelt located above the Campus and urbanized Berkeley and Oakland residential areas. O6-6

However, the current WVFMP/EIR is a political plan that relies on inadequate vegetation mapping, inadequate fire behavior modeling, inadequate treatments of flammable blue gum eucalyptus and Monterey pine forests, and on haphazard management of planted flammable vegetation and unmanaged native vegetation without adequately funded and assigned staffing for 800 acres of high risk and sensitive university land. The Draft WVFMP/EIR must be redone to provide required vegetation risk reduction and management detail for public transparency before a final project is selected, analyzed, and approved. (Attachment B- pdf of panels for review and discussion of UC Hills WVFMP/EIR issues)

B. The draft WVFMP failed to prepare accurate and useful vegetation and plant community information and detail needed for public disclosure and environmental analysis. The draft Plan and final WVFMP/EIR's discrepancies in communities to be managed and fire modelling must be made consistent. The draft Plan and the WVFMP/EIR should have used an accurate vegetation map to provide baseline integrity for everything that followed. The draft Plan was a piecemeal plan illustrated by the project maps and policies represented in figures 5, 10, and 23. The 34 different vegetation and land use types used in the statewide Figure 10 LandFire map, even if accurate, resulted in a kaleidoscope of vegetation and fire behavior that the public and O6-7 agency officials could not be expected to understand. The map used in the draft plan was not clear enough for public review and understanding or for comparison with the McBride Alternative A Vegetation Map. And an Alternative B vegetation map was not prepared for comparison. The WVFMP/EIR map represented by Figure 3.5-1 map should have been used in both the draft Plan and the recommended plan for fuel modeling to determine flame height, rate of spread, and other fire behavior information based on clear vegetation management prescriptions. (Attachment C- McBride map of UC Hills vegetation for comparison purposes)

C. There is now worldwide public awareness about the flammability of blue gum eucalyptus and pine trees that can't be denied. However, there is a code of silence based on fear of conflict, inadequate funding for either capital costs or ongoing maintenance, and unverified opinions about the flammability of eucalyptus and pine forests on the part of UC and other East Bay agencies. Instead, agencies have attempted to apply concepts developed for Sierra timberlands ~~which have been controversial and not yet applied successfully by state and federal agencies.~~ In addition, the fire mitigation details and long-term maintenance costs and history of failed O6-8 ongoing maintenance of flammable forest and open space lands by UC and other agencies is not adequately described in the draft Plan or the draft WVFMP/EIR. As a result, the public and agency officials are clueless about eucalyptus and pine forest fire hazard exposure and the costs and environmental impacts of short and long time care and eventual removal of hazard and decadent trees. (Attachment D- folder of flammable eucalyptus tree articles and applicable science)

D. Surveys of vegetation to be managed and a simple forest analysis was not done, and actual before and after project completion numbers are not described. There is nothing in the draft Plan, the draft WVFMP/EIR, and in the record about the actual type of eucalyptus and pine stands currently found on the UC Hills Campus. Tree numbers are needed for public information to document and analyze before and after treatments of tree stems/acre, coppice, seedling, and mature tree numbers, and information about native and non-native understory to be removed or retained. The draft WVFMP/EIR also did not provided adequate fire safe standards and analysis for initial thinning, removal, conversions to natives, and for the ongoing management of eucalyptus, pine, oak/bay woodlands, shrublands, and grasslands.

Only generalizations like accomplishing tree fire hazard reduction by selecting removals and retention "one tree at a time". Generalizations of this type are used to keep the public in the dark about the scale of potential projects noted in figure 3.5-1. Specific forest details should be included in both the draft Plan and the final WVFMP/EIR to determine if the WVFMP is feasible. Without details it will not be possible to make comparisons with Alternative A and to analyze the differences between alternatives for environmental impacts and for final Project selection. (Attachment E- pdf of eucalyptus grove photos along Claremont Canyon Avenue as an example for flammable groves logged after the 1972 freeze, with 1,000 eucalyptus and native tree stems per acre) O6-9

E. The final Hill Campus FM Plan/EIR should recognize that thinning of eucalyptus stands will not be a viable long-term strategy for reducing fire hazards in the steep and windy hill areas of the Campus and that the WVFMP therefore would not meet project objectives. The draft Plan should have reported that a thinning strategy is unproven or at least controversial for blue gum eucalyptus and Monterey pine where tree canopies and ribbon bark are impacted by fire on steep slopes by Diablo winds periodically exceeding 40 mph.

Thinning of pine forests in the Sierra and management of eucalyptus forests in Australia are commonly combined with a program of regular prescribed burning (every 5 to 10 years) which has never been done at scale in the East Bay Hills, and may not be possible in the UC Campus Hills. We do support the eventual use of prescribed fire on already made safe plant communities, but not for eucalyptus and pine groves on steep hillsides with 40 percent and above slopes. O6-10

Given the history of failed and successful fire hazard mitigation efforts that have been sustainable. Only removal of the 1972 freeze and logged eucalyptus coppice stumps and seedlings is financially and environmentally warranted to release and manage the lower growing and potentially safer native plant understory community as has already been done successfully by UC. Currently available examples are to be found at the South side of Claremont Canyon. At EBRPD's side of the Frowning Ridge Fuelbreak. At UC's Chapparal Hill. And at the East side of the EBMUD Grizzly Ridge Fuelbreak and its ongoing effort to remove eucalyptus at Grizzly Ridge and Grizzly Peak. (Attachment F Stephanie Lin 2009 Thesis about the Restoration of Native Flora Following Eucalyptus removal. Referrals are also made to three papers by Jerry Kent posted on the Claremont Canyon Conservancy web page including: Diablo Winds, Wildfires, and Flammable Vegetation in the East Bay Hills, How the East Bay Got its Eucalyptus and Pine Forests, and the Risks and Costs of Eucalyptus and Pine)

F. The WVFMP/EIR did not describe and analyze the adequacy of fire mitigation projects of its neighbors or the cumulative impacts of projects by major agencies East of the Campus Hills. The University is clearly not a self-contained island that is isolated from other high risk public lands and residential areas that have experienced repeated wildfires. EBRPD and EBMUD contain extensive open space areas with substantial fuel loads of highly flammable, eucalyptus and pine groves. Diablo Winds come from the East and LBL has modeled the potential for a 60 ft high wall of wildfire coming from EBRPD and University land. The following quotes are from a publication titled Project Shields Lab as Well As Berkeley Neighbors From Wildfire by Jeffery Kahn dated January 12, 2001.

> "The Laboratory manages the entire site under the assumption that in a firestorm, thousands of firebrands will descend upon the Laboratory," says McClure. "These firebrands will ignite vegetation across the site and fire will consume the vegetation around individual buildings in less than ten minutes. But because of the vegetation management effort we have done, these fires will be low-temperature and low-flame. This is the keystone of our defenses: we have reduced fuel levels so that these fires cannot penetrate and ignite the buildings."
>
> Throughout the landscape, the fire characteristics of the site have been evaluated. Where the risks are excessive, the Laboratory has modified native plant communities along the spectrum of the natural succession. The goal is to retard and to accelerate successional forces in selective areas so that fire risks are effectively managed using natural plant communities.
>
> Six years into this complex effort, the Lab has expended a very modest $1.1 million with $600,000 of remaining corrective vegetative work to be done over the next two years. This represents about three-tenths of one percent of the value of just the Lab's buildings (not counting that which is inside). After this initial work is completed, the annual vegetation management bill to ensure the future existence of the Lab will be approximately $100,000. O6-11
>
> At the lab's flanks, additional firebreaks and enhancement of existing breaks have been engineered using computer models. Within these firebreaks and within selected wooded areas throughout the site, trees have been felled or thinned and had their lower limbs removed.
>
> You manage in a way to stop an incoming crown fire. You bring it down to the ground," said McClure. "Before, we would have had 60-foot flames burning uphill toward the Laboratory firehouse. Now, with the breaks and vegetation management, we would get three-to-five-foot flames.
>
> Fifty acres of the Lab had been overgrown with French broom, a highly flammable exotic brush. Now, all of the French broom is gone. Every year, a crew comes in and removes any regrowth, a job that must be continued in perpetuity. But every year, the job becomes easier.
>
> To sustain the fire-safe landscape that has been created by this project, the principles are relatively simple, said McClure. "Grasses we cut. Bushes or brush we thin. Trees we limb up. The end result is a wooded, park-like setting for a complex of buildings that is able to survive a wildland fire."

Computer modeling consistently indicated that the eucalyptus trees above Building 74 on the Lab's critical eastern flank would shower the Lab and Berkeley neighborhoods with firebrands. Now, said McClure, those trees are gone and there is not going to be a storm of firebrands streaming out of the Lab into neighboring residential areas."

LBL proceeded with its own unique fire mitigation approach to create defensible space for its buildings and for its neighbors. However we do not believe the approach used by LBL complies with existing UC policy for the larger Campus Hills or is appropriate for the remainder of Strawberry and Claremont Canyons. For the past 25 years UC has adopted policies and programs which we have supported to successfully remove flammable eucalyptus and pine in Strawberry and Claremont Canyons, along Frowning Ridge below Grizzly Peak to Claremont Avenue, and on Chapparal Hill. We find the potential use of thinning represented in the draft Plan and draft WVFMP/EIR to be significant and not adequately described or analyzed. (Attachment G- Revised map of completed and proposed UC and adjacent agency eucalyptus and pine removal project areas based on WVFMP/EIR map 3.5-1) O6-11 cont.

<u>G. The University should have included in its draft WVFMP/EIR, a dedicated rapid response and early fire ignition detection and suppression wildfire mitigation addition.</u> Specifically, the final draft WVFMP/EIR should include a fire mitigation provision for twenty four hour annual camera and satellite coverage for early ignition detection, coordinated fire behavior modeling during a fire, and for providing initial fire suppression response from a new Campus or Cal Fire Unit with fire trails wide enough for Cal Fire or local agency Type 3 Fire Engines. O6-12

The WVFMP/EIR also did not address how the University vegetation and fuel management plans relate to State Cal OES and Cal Fire suppression programs or consider the potential addition of Cal Fire Unit to be in charge of ignition discovery and response to early fires followed by a coordinated agency suppression program for the East Bay Hills. Currently the WVFMP/EIR states that fire services will be the responsibility of Berkeley, Oakland, Alameda County Fire District, Moraga Orinda Fire Protection District, with mutual aid support from EBRPD and other nearby fire departments. <u>No agency is assigned the lead role even though the University is a State Agency.</u> The UC Hills Campus is exposed to wildfire threats common to the East Bay Hills at an areawide scale, and both protection and suppression must be addressed at this large scale. The final Hill Campus FM Plan/EIR should include in its fire mitigation provisions an East Bay Hills Cal Fire Unit near the Campus. Currently, the Santa Clara Cal Fire Unit headquarters are located too far South in Mountain View with local fire stations near Sunol and Morgan Territory that are strategically placed in rural areas to respond to grassland fires common to Eastern Alameda and Contra Costa Counties, and not to the higher risk East Bay Hill urban interface where major lose in life and homes have happened and can be expected to happen again. O6-13

<u>H. The WVFMP should not have been selected as the preferred alternative in the EIR process because it did not provide for an adequate Grizzly Peak Boulevard ridgetop fuelbreak that would include solving the joint-agency vista turnout problem that has increasingly become a known location for fireworks, bonfires, and large day and night-time gatherings.</u> The title of the Oakland Tribune article of Monday August 22, 1932 when 2000 Onlookers witnessed the opening of the new roadway was "New Scenic Road Opened in Berkeley". The article stated that the new road served a three-fold purpose. "namely that work has been provided for hundreds of men (during the great depression) who otherwise would have been out of employment; that a new scenic drive will attract many tourist in years to come has been developed; and the Eastbay has been given a natural fire break which will add further protection from hill blazes". O6-14

Since then, the saga of Grizzly Peak Boulevard has become more complex because Berkeley, Oakland, UC Berkeley, EBRPD, and EBMUD are now responsible for specific elements of the "New Scenic Road" including planning for and developing roadside turnout improvements and maintaining public viewing areas where many tourists and residents come to enjoy spectacular views of the San Francisco Bay Area. These agencies are also responsible for maintaining their lands adjacent to Grizzly Peak Boulevard to ensure that this high ridge corridor will serve its stated purpose as a fire break for protection from hill blazes.

However, Grizzly Peak Boulevard between Claremont Avenue (four corners) and Centennial was designated as a sheltered fuelbreak in the McBride Plan, but was amazingly not designated as a fuelbreak of any kind in the WVFMP/EIR. Grizzly Peak Boulevard is one of this Region's most important roadways, and should be listed and managed as an evacuation corridor with fuelbreak vegetation treatments similar to the provisions for Claremont Avenue. The treatments for turnout parking in the draft Plan and the draft WVFMP/EIR are also inadequate. The final WVFMP/EIR should provide for a capital plan and management program needed to replace existing temporary logs, paving of gravel areas, roadway edge control, joint agency staffing or gates for road closure, and policies for red flag and night time closure of vista parking areas. O6-14 cont.

I. The WVFMP/EIR failed to include a mitigation provision for jointly working with Oakland and Berkeley to harden homes against potential embers adjacent to University Hill lands in Strawberry and Claremont Canyons. The WVFMP/EIR was obviously developed to justify the provisions of a recent Cal Fire grant in the absence of an approved regional fire mitigation plan for the East Bay Hills that covers flammable and high-risk agency open space vegetation and adjacent high risk urban residential areas. Firestorms in California are growing larger and more destructive, and experts and state legislation make it clear that it is now necessary to focus on houses at the same time that strategic fuelbreaks and wildland vegetation fire mitigation projects are being planned and analyzed. The University is obviously unable to ensure that vegetation fires originating on its property, whatever the cause of ignition could be, will not produce burning embers during Diablo wind driven fire that could ignite adjacent public or private vegetation and homes in residential areas. Therefore, the University should have included a mitigation provision to work with the cities of Berkeley and Oakland to ensure that homes adjacent to the University Campus Hills in mapped Cal Fire VHFHS zones are hardened based on the proposals of Jack Cohen and the USFS and current Cal Fire recommendations for home hardening that are necessary for residential resiliency and home survival. (Attachment H. Fire Brands in Large Scale Fires) O6-15

J. The WVFMP/EIR project analysis and project selection is inadequate. The Hill Campus FM Plan/EIR needs to investigate and analyze feasible mitigation measures or alternatives that could mitigate or avoid significant project impacts. If any mitigation measure or alternative is to be rejected as infeasible, the DEIR needs to present substantial evidence to support a decision to find the measure or alternative infeasible, using CEQA's definition of feasibility.

The McBride Plan is a comprehensive plan prepared by the most informed and experienced individual who knows more about the UC Hills than any staff member or hired consultant. Dr. McBride is Professor Emeritus of Forestry, Landscape Architecture, and Environmental Planning, Department of Environmental Science, Policy, and Management, UC Berkeley. He has specializations in vegetation and ecological analysis, urban forestry, and historic landscape restoration. In addition to his teaching, Professor McBride has worked as a consulting Forester and Landscape Ecologist in the Bay Area for over 40 years. His consulting work focuses on the preparation of vegetation analysis and management plans. His clients included federal, state, county, and city agencies, legal firms, corporate land owners, private land owners, and foreign governments. Education includes: Ph.D. Botany, University of California, Berkeley; M.S. Forestry, University of California, Berkeley; BS Forestry, University of Montana, Missoula. O6-16

The McBride Plan (Alternative A) is discussed and reviewed as an extreme opposite of the Alternative B proposal. The draft UC Hills WVFMP is then justified and selected as the middle of the road political fire mitigation plan using an infeasible and incomplete WVFMP for the faulty EIR analysis found in pages 367 through 452. O6-16 cont.

The WVFMP does not meet project goals, and is included a 1,200 page cumbersome document that is beyond the review capability of the public with short notice to meet an October 2, 2020 deadline. O6-17

The stated reasons for rejecting the McBride Plan (alternative A) included:

- No broadcast prescribed burning would be conducted.
- No temporary refuge areas would be developed.
- No chipping of biomass or reuse onsite would occur; accordingly, pile burning would substantially increase relative to the WVFMP.
- A 300-foot-wide non-shaded fuel break would be created on the ridgeline between Strawberry and Claremont canyons (the WVFMP includes a 126-foot-wide non-shaded fuel break that extends from Frowning Ridge to Claremont Canyon). O6-18
- Water tanks would be installed on Grizzly Peak Boulevard.
- An Alameda whipsnake preserve would be created on the upper south facing slopes of Strawberry Canyon.
- Fire roads throughout both Strawberry and Claremont canyons would be widened and graded to accommodate the Type 3 fire engines purchased.

All of these items or some reasonable modification are required to meet the eight listed objectives of the project. Rejection of the McBride alternative for these stated reasons did not allow for an accurate comparison with the draft WVFMP alternative during a faulty DEIR process.

ATTACHMENT B- List of Maps and Panels submitted as a pdf along with Jerry Kent comment letter about the draft UC HILL WILDLAND VEGETATIVE FUEL MANAGEMENT PLAN/EIR (WVFMP/EIR).

1. Fire Hazard Severity Map (Figure 3.12-1)
2. Fire History Map (Figure 6)
3. UC Hills Area Topographic Map- showing areas where firefighting will be problematic
4. Map of Ongoing Treatments Funded by Cal Fire (Figure 5)
5. Map of Current Vegetation Types, from 2016 LandFire Data (Figure 10) O6-19
6. Fuel model distribution in the Hill Campus (Figure 11)
7. Flame Length Projections with 40 mph NE winds (Figure 19)
8. Rate of Spread Projections with 40 mph NE winds (Figure 20)
9. Map of All Project Area Treatments (Figure 23)
10. Map of Current Vegetation Communities (Figure 3.5-1)
11. Map of Identified Treatment Projects (Figure 2-2)
12. Map of Roads, Trails, and Grizzly Peak Blvd. Turnouts (Figure 3.11-1)

TO: Raphael Breines, Senior Planner, 300 A&E Building, UC Berkeley, CA 94720-1382
By Email: planning@berkeley.edu

The following comments are submitted as a response to the proposed Hill Campus Wildland Vegetative Fuel Management Plan, the NOP, and the Initial Study.

The Conservancy has been a strong supporter of the Universities efforts to mitigate fire hazards on the Hill Campus since the 1991 fire. Including the significant fire hazard reduction improvements that were achieved between 2000 and 2007 in Claremont Canyon, at Chaparral Hill, and along the Grizzly Peak Boulevard Ridgetop Fuel break between Grizzly Peak and Chaparral Hill. We believe UC was able to accomplished important fire mitigation work at these project areas with limited funds, limited staffing, and without opposition by the public.

Unfortunately, after being awarded a substantial grant in 2005 requiring FEMA to complete an Environmental Assessment, a small group of residents (HCN) in 2008 opposed the draft Strawberry Canyon EA. They complained about UC and its proposed projects, they wanted UC to act like EBRPD, and they wanted to live in the urban/wildland interface while wanting everyone to respect their right to put themselves in harm's way. They lobbied FEMA to do a more extensive East Bay Hills EIS for Hazardous Fire Risk Reduction that was then challenged by the group seven years later in litigation with FEMA in 2015. Shockingly, UC and Oakland's grant funds and their USFWS biological mitigation provisions were yanked at the last minute by a questionable settlement agreement between HCN and FEMA in 2017. Dense, flammable, and unsustainable eucalyptus and pines now remain on Hill Campus lands on the North side of Claremont Canyon and in Oaklands Tunnel Canyon putting everyone at risk during a time of increasing state-wide wildfire disasters. O6-20

Until the Tubbs, Carr, Valley, Nuns, Thomas, and Camp fire's we thought nothing could be worse than the 1991 Oakland/Berkeley firestorm that killed 24 people in less than one hour and destroyed a significant number of homes in Claremont Canyon and the Oakland/Berkeley hills. We now know better, so the Conservancy is pleased that UC has not given up and is moving forward with a Hill Campus Fuel Management Plan/EIR supported with initial funding from a Cal Fire grant for $3.6 million. I believe the Conservancy will continue to be a strong advocate for the Universities fire hazard mitigation projects on the Hill Campus, and a continued supporter of UCs final efforts in developing and implementing a sound plan. However, Conservancy members have waited 12 years for obvious fire mitigation work to be completed and are terrified of the damage that would result if a major Diablo wind wildfire occurred on or blew through the Hill Campus.

My comments are intended to urge UC to move carefully with deliberate speed, and are submitted as a Conservancy board member on behalf of the Claremont Canyon Conservancy.
Jerry Kent, December 18, 2019

A. Overriding Policies in the UC Berkeley 2020 Long Range Development Plan that we believe should guide the current Hill Campus FM Plan/EIR process O6-21
- "First, the Hill Campus is a scenic and recreational resource for the entire East Bay, and is part of the continuous greenbelt of park and watershed land that extends the length of

the East Bay Hills from Richmond to Hayward. A greenbelt of such size and integrity, in such close proximity to densely urbanized areas, is a unique feature of the region and contributes significantly to the quality of East Bay life." (Page 51)

- "Second, the mix of scrub and conifer and eucalyptus stands make the East Bay Hills, including the Hill Campus, a regular seasonal fire risk. This risk becomes particularly pronounced during the periodic one-or two-day shifts from the normal northwesterly winds to Diablo winds blowing from the warm, dry regions to the east. 20th century Diablo wind fires have burned over ten times the acreage of normal wind condition fires and include the firestorms of 1923 and 1991. The steep terrain and poor access and infrastructure in the Hill Campus present enormous obstacles to fire response, and some areas such as Claremont Canyon may be indefensible in Diablo wind conditions." (Page 52)

- "Third, the steep terrain and the poor access and infrastructure also make development itself more disruptive and costly. Over 75% of the Hill Campus has a slope over 40%, and over 90% has a slope over 20%. Areas with slopes under 20% are scattered throughout the Hill Campus, often in locations not served by either roads or utilities." (Page 52)

- The UC 2020 LRDP Policy is to: "Manage the Hill Campus Landscape to Reduce Fire and Flood Risk and Restore Native Vegetation and Hydrology Patterns. UC Berkeley maintains an ongoing program of fire fuel management in the Hill Campus to reduce fire risk to the campus, LBNL, neighboring residents, and recreational visitors to adjacent park and watershed lands. While the treatment used in a given area must be customized to address its specific conditions, including vegetation type, access, and proximity to roads and structures, in general the treatments are designed to meet one or more of the following goals:
    - Reducing fuel load by removing dead material, reducing plant density, and favoring species with lower fuel content,
    - Reducing horizontal spread by reducing fine fuel material and by separating dense clusters of vegetation with areas of lower fuel load, and
    - Reducing vertical fire spread by increasing separation of understory and crown fuels.

  Whenever feasible, future fuel management practices should include the selective replacement of high-hazard introduced species with native species: for example, the restoration of native grassland and oak-bay woodland through the eradication of invasive exotics (broom, acacia, pampas grass) and the replacement of aged Monterey pines and second-growth eucalyptus. Such conversions must be planned with care, however, to avoid significant disruptive impacts to faunal habitats." (page 57)

O6-21 cont.

B. Specific comments about the NOP and the Initial Study

1. The NOP as written is inadequate because it appears to be based on a partial Plan for the UC Hills that is incomplete and likely guided by a CAL FIRE California Climate Investments Fire Prevention Grant instead of by a comprehensive Plan like the McBride Plan, that will be required for the UC Hills. The current NOP makes the following statement which

O6-22

indicates that the NOP contains a partial plan which in our opinion will not survive a rigorous review including a required cumulative impact analysis.

> "Facilities Services recognizes that additional work will be required and anticipates that it will increase its implementation of defensible space and roadside treatments, roadside turnout treatments, exotic plant removal, hazard tree removal, signpost treatments, and selective tree planting throughout the Plan Area".

O6-22 cont.

2. The NOP as written is inadequate because it proposes without a plan or alternatives the removal of all trees and shrubs (bare ground?) in a few selected locations, usually near intersections of roads and fire trails, in a minimum 200-foot diameter from the edge of pavement or fire trail to create a temporary refuge area for firefighters and evacuees.

3. The NOP as written is inadequate because it makes statements about fuel breaks (without a comprehensive plan) that are general in nature, some of which we may agree with and some we may oppose, does not propose alternatives, and may not be site specific to the UC Hill Campus.

   - "fuel breaks are strategically-located linear strips where vegetation has been treated or removed to aid in the containment of a fire and reduce the likelihood of crown fire transition."
   - "fuel break treatments under the Plan, UC Berkeley would either remove understory vegetation and select trees (i.e., shaded fuel breaks) or remove all tree and shrub vegetation in the fuel break area, leaving only some herbaceous vegetation (i.e., non-shaded fuel break) to minimize fire intensity if ignited by a wildland fire."
   - "Treatment would also alter the structure of the forest to inhibit torching and ember distribution."
   - "Fuel breaks serve the dual purpose of creating a non-burnable area to stop the spread of fire and as a defensive position to enable effective firefighting and fire-retardant application."
   - "Fuel break treatments in the Plan Area would could be up to 200 feet wide and installed on ridgelines or other areas naturally low in vegetation to limit the spread of fire from trees between canyons."
   - "Treatment activities used to implement fuel break treatments could include any of the proposed treatment activities included in Table 2-1."

4. The NOP as written is inadequate because it makes general statements about vegetation without a comprehensive plan that are general in nature, some of which we may agree with and some we may oppose, does not propose alternatives, and may not be site specific to the UC Hill Campus.

- "fire hazard reduction treatments would focus on reducing hazardous fire conditions in the Plan Area to help promote landscape resiliency and improve native habitat".
- "Fire Hazard Reduction Treatments are less refined than the ongoing defensible space treatments (described in Section 2.3) in several ways: grasses are not mowed and there is no requirement to prune trees".
- "Additionally, shrubs are retained in clumps. Treatments could involve a variety of activities, including manually and mechanically removing high fire hazard vegetation and trees, applying herbicides, and replacing fire-prone vegetation with fire-resistant trees and shrubs".
- "In some limited cases, irrigation could be installed to support the new fire-resistant vegetation. UC Berkeley would evaluate trees and shrubs for vertical and horizontal spacing; remove tall, unhealthy, structurally unsound or highly flammable trees that are likely to torch and distribute embers; and remove short understory trees".
- "Criteria for tree removal would include consideration of tree health, structure, height, potential for failure, flammability/fire hazard, high fuel volume production of small diameter fuels, and competition with other trees (including for water, space, and light)".
- "Criteria for retention of trees includes consideration of whether its removal would facilitate the spreading of invasive plant species and inhibit growth of surface fuels, improve habitat within the understory, encourage nesting and improve flight patterns of raptors, and prevent erosion".

5. The NOP as written is inadequate because it makes general statements about trees without a comprehensive plan that are general in nature, some of which we may agree with and some we may oppose, does not propose alternatives, and may not be site specific to the UC Hill Campus.
    - "trees cut would be chipped and distributed throughout the treatment area, or kept as logs".
    - "In unusual circumstances where the added volume of the tree is insignificant (i.e. where trees are sparse and shrub cover is thick), trees would be bucked, (i.e., cutting a felled and delimbed tree into logs) and the tops cut into lengths no longer than 24 inches and placed beneath the shrub canopy to accelerate decomposition".
    - "Trees would be typically cut using a mechanized feller-buncher and hand tools".
6. The NOP as written is inadequate because it makes general statements without a comprehensive plan about herbicides, logging, potential use and location for a gasifier, and roadside vegetation management, some of which we may agree with and some we may oppose, does not propose alternatives, and may not be site specific to the UC Hill Campus.

- "to prevent re-sprouting, an herbicide would be applied to eucalyptus and acacia stumps within 3 minutes of cutting by a licensed California Qualified Applicator".
- "Felled trees would be skidded by rubber-tired or tracked vehicles along skid trails to landings. At landings, trees would be stored or chipped using a grapple-fed chipper or a tracked chipper".
- "Chips would be both spread on-site and transported to a gasifier to supply electricity directly to the campus. Refer to Section 2.7, "Biomass Utilization and Disposal," for more information about the gasifier".
- "Near roads, trails and buildings, lower limbs of trees would be pruned, understory vegetation shortened, and grass mowed".

C. The final Hill Campus Wildland Vegetative Fuel Management Plan (Hill Campus FM Plan/EIR) must be based on verifiable wildland/urban fire mitigation science, natural resource management science, sustainable land management principles, and the requirements of law to include the following :

1. The Initial Plan (in the NOP) was too general and vague. The project areas should include the entire 800-acre Hill Campus. The Claremont Canyon Conservancy strongly recommends that UC planners base their Plan and EIR on the McBride Fuel Management and Wildfire Mitigation Proposal for the University of California Property in Strawberry and Claremont Canyons.
2. The Hill Campus FM Plan/EIR needs to identify and implement methods of vegetation management that will decrease both the short-term and long-term liability for the University resulting from damage to people, property, and/or the environment from wildfires occurring on or moving through the Hill Campus. O6-23
3. The Hill Campus FM Plan/EIR needs to identify and describe both short-term and long-term goals for the project – i.e., reducing the risk of wildfire damage over the next 2-10 years as well as decreasing the risk of wildfire damage over the longer-term 10-30 years.
4. The Hill Campus FM Plan/EIR needs to include revisions to the revised draft Plan after identifying and analyzing priorities for accomplishing the different tasks included in the Plan. The vulnerability of Hill Campus project areas to wildfires is ongoing and increasing so the final Plan should include provisions for adaptive management based on changing conditions and new information.
5. The Hill Campus FM Plan/EIR needs to identify and rank the areas of highest wildfire risk – both in terms of the likelihood of a wildfire ignition and the severity of the damage a wildlife is likely to cause based on critical examination of hard evidence, and the potential effectiveness of various methods of vegetation management in decreasing wildfire risk.
6. The Hill Campus FM Plan/EIR needs to analyze and rank the priority of applying described control methodologies to park areas that maximize Plan effectiveness in reducing wildfire damage, both to the environment, to people, and to property based on the following priorities:
   - Protection for people, human health, and safety from both direct and indirect effects from wildfires,
   - Preventing irreparable harm that cannot be adequately avoided or mitigated for destruction of homes and private property,

- Preventing irreparably damaging to populations of protected plant, listed animal species and their habitat including wildlife migration corridors,
- Protecting and mitigating potential fire impacts on park recreational, aesthetic, and scenic values.

7. The Hill Campus FM Plan/EIR needs to investigate and analyze feasible mitigation measures or alternatives that could mitigate or avoid significant project impacts. If any mitigation measure or alternative is to be rejected as infeasible, the DEIR needs to present substantial evidence to support a decision to find the measure or alternative infeasible, using CEQA's definition of feasibility. O6-24
8. The Hill Campus FM Plan/EIR needs to take into account the effects of future climate change while analyzing projects in the Plan including the cumulative effect of future climate change on the environment. Under a "business as usual" scenario, temperatures are now projected to rise 3.5 degrees Centigrade (~6.3 degrees Fahrenheit) by 2100 causing increases in the number of wildfires and extreme weather days in the state and the region. O6-25
9. The Hill Campus FM Plan/EIR should analyze, provide alternatives, and make recommendations to inform policy makers about hotly debated and controversial issues about fire and resource management science, eucalyptus and pine trees, herbicides, and the public desire to save trees that became apparent during earlier plans, including: O6-26
   - The relative number of trees in groves that are considered fire hazards to be removed and the number of trees in groves to be saved that are considered to be less of a fire hazard during forest treatment alternatives in relationship to the current total number of similar trees in groves in the East Bay Hills.
   - The relative differences in fire and liability risks today between already planted large groves of trees (eucalyptus and pine forests) and lower growing native groves of trees (oaks, willows and bays woodlands).
   - The relative differences in fire mitigation in dense 1,000 stems per acre groves remaining in logged areas by removing second growth eucalyptus coppice stumps and seedlings and saving understory oaks and bays vs. keeping 40 eucalyptus trees per acre and removing all understory native vegetation and managing a cleared understory for the next 50 years.
   - The relative feasibility differences in thinning high fire risk trees to manage and retain groves with eventual large tree removal costs in the future vs. the use of one-time grant capital funds to efficiently remove high-risk tree fire risk trees to be replaced by understory native vegetation identified in each area in the final Plan.
   - The relative differences in available science based methodologies for fire Behavior Analysis that would provide better descriptions of flame height, rate of spread, and other factors to inform policy makers of the relative fire danger of vegetation in the UC hills, along evacuation routes, and in public open space areas in the project area. The fire behavior science in the 2010 Park District Plan/EIR and the 2017 FEMA Plan/EIS were largely not recognized as important by the public and media as an issue to be understood leaving most arguments about saving trees and not using herbicides. UC's final Plan's fire based science about vegetation fire

hazard descriptions must be accurate and useful for a conflicted public and for public officials who must decide how to make the city reasonably fire-safe.

- The relative differences in the use and environmental impacts of using or not using approved herbicides by licensed operators vs. labor intensive hand and mechanical treatments to remove flammable weeds and other flammable vegetation.
- The relative differences in a claim made by some individuals and groups that it is not necessary to mitigate fire hazards by removing eucalyptus, pine, and cypress trees or managing flammable park vegetation because residents instead should harden homes and accept the fact that uncontrollable wildfires are a part of living near the Campus and generally in the East Bay Hills.
- The relative differences in the desire for a "species neutral" approach that proponents assume would result in keeping costly and flammable hazard trees like eucalyptus and pine while removing less costly and flammable trees like native oaks, bays, and maples.
- The relative differences for the Campus and nearby residents in assuming that another major fire will happen soon vs. residents who want to live near the Campus "just like it is today" and are not worried about a major fire during a period of global warming when fires are now a year-round threat and the East Bay is due for another 20 year cycle of fire.
- The relative differences between the use of fuel breaks only to be located adjacent to residential areas vs. a comprehensive plan of vegetation management like the McBride Plan to prevent the intensification and spread of an incipient or already-developed wildfire.
- The relative differences between "a West wind" and "a Diablo wind" wildfire and their impact on the flammability of different species and different ecotypes (e.g., chaparral, pine/eucalyptus forest, oak/bay forest, oak/grasslands) and the capability for controlling wildfire in each condition.

O6-26 cont.

D. Comments concerning additional issues that should be addressed in the final Hill Campus Wildland Vegetative Fuel Management Plan (Hill Campus FM Plan/EIR).

1. The final Hill Campus FM Plan/EIR should address the fact that the Hills and portions of the current UC Campus Hills were forested for real estate development 120-years ago and by the University more recently for research projects on the Campus Hills that are now covered with trees and unmanaged vegetation that will burn as a wildland/urban intermix fire that can't be stopped. Dense and flammable residential areas also occur near the Campus on steep hillsides with narrow roads that will not allow residents to quickly evacuate during a major Diablo wind fire. We believe that flammable eucalyptus and pine trees that are identified in the final Hill Campus FM Plan/EIR should be removed, as proposed in the UC 2020 Long Range Development Plan, to release safer understory native vegetation to be managed appropriately. O6-27
2. The final Hill Campus FM Plan/EIR needs to be independent of other typical Cal Fire-funded thinning projects. Plans for dealing with coppice eucalyptus plantations at the wildland-urban interface, for example, should not be based on plans for managing pine O6-28

forests in the Sierras intended for lumber production. Thinning of second-growth coppice blue gum eucalyptus trees is neither a safe nor sustainable method of creating a "healthy forest of blue gum eucalyptus trees" without regular use of prescribed fire in the densely, over-developed, steep, and periodically windy East Bay Hills wildland/urban interface and intermix.

3. The final Hill Campus FM Plan/EIR must be separated from the Cal Fire award of a grant for partial work without a comprehensive plan. Care must be taken that a "cart before the horse" approach to justify the provisions in a grant does not interfere with a transparent and unbiased public process required by CEQA and NEPA laws. O6-28 cont.
4. The Universities Hill Campus FM Plan/EIR should be developed recognizing that Diablo wind fires have proven to be unstoppable in unmanaged wildland vegetation. The Hill Campus FM Plan/EIR must include a comprehensive land management plan, such as the McBride Plan, while also relying on locally mandated and enforced home hardening and defensible space provisions to be administered by local agencies.
5. The University should work with the cities of Berkeley and Oakland to ensure that homes in mapped Cal Fire VHFHS zones are hardened to resist extreme fires with adequate defensible space around homes and within the community. East Bay Hill residents in Cal Fire VHFHS zones must be accountable for preparing their homes for wildfire and protecting themselves by having a family evacuation plan since there will not be a fire truck for every home and residents will be evacuated during all major fires. O6-29
6. The final Hill Campus FM Plan/EIR should describe why East Bay Hill fires are different than the fires in Southern California, the fires in forested areas of the Sierra, and why fire mitigation efforts must be site and vegetation specific to address this area's development and vegetation history that has contributed to recognized fire hazards in the East Bay Hills wildlands and residential areas.
7. The final Hill Campus FM Plan/EIR should describe how recommended fire projects in the Plan will address future fire risks associated with global warming, extreme weather, and the new normal for more fires often described by Cal Fire, in numerous scientific publications, and by the media. O6-30
8. The final Hill Campus FM Plan/EIR should include numbered polygons of project areas with cost projections for project work to facilitate grant requests and development of annual budget requirements. O6-31
9. The final Hill Campus FM Plan/EIR should describe how the Campus will be prepared for the "new normal fire future" including climate change and the probability of more wildfires during the present century. Fire mitigation principles developed between 1991 and 2019 must be upgraded to incorporate new lessons learned in the past 28 years because the Oakland/Berkeley Hills have unfortunately held the record for the state's most damaging and costly fires for 93 of the years since the 1923 fire, and the University must take aggressive steps to ensure that its Hill Campus and adjacent residential areas are reasonably fire-safe in the future. O6-32
10. The final Hill Campus FM Plan/EIR should expand on the description of fire behavior to address the fact that the four most damaging fires in California history have all occurred under similar circumstances (Berkeley 1923, Oakland 1991, Tubbs 2017, and Camp 2018), and that the State of California has a history of siege fires that can make quick and adequate response problematic. The most significant damage occurred in the Berkeley fire in 4 hours, the Oakland Tunnel fire a one-day fire, the Tubbs fire in one-night, and the

Camp fire in one-day when firefighting was impossible. Lessons learned have now made clear that science based reduced fuel loads in wildland areas and residential areas with ember resistant homes would have made a difference.

11. The final Hill Campus FM Plan/EIR should describe the differences between forest fires and urban intermix fires. The current theme for addressing forest fire hazards in the Sierra is to thin and then burn forests on a regular schedule to create healthy native forests that can survive repeated wildfires. We believe that model does not work in the East Bay Hills urban/wildland intermix because of extensive areas of planted eucalyptus, pine, and acacia, and that the UC Hills Plan and EIR must describe a viable model that is understandable and based on native woodlands, shrubland, and grasslands that can be managed by University employees. O6-33
12. The final Hill Campus FM Plan/EIR should upgrade the wildland and residential area data set and analysis that was developed for the 1995 East Bay Hills Vegetation Management Program that was largely the work or the UC Fire Science Lab, Campus Professors, and project consultants. Further, the 1995 wildland and residential hazard analysis should be used as a baseline for measuring improvements in fire safety projects that are included in the eventual UC Hills Campus Vegetation Management Plan.
13. The final Hill Campus FM Plan/EIR should describe the 1972 freeze and its impact on high-ridge Campus, Tilden, and Claremont Canyon eucalyptus trees using before and after aerial photos (provided here and attached), and describe the logging that took place to remove eucalyptus trees, litter, and other ground fuel to prevent another fire for the next twenty years. Also describe the fact that the East Bay has experienced freezes in 1921, 1933, 1972, and 1991 that have impacted eucalyptus trees in specific areas requiring either removal or cleanup. Also, note that the October 1991 fire followed an earlier freeze during the winter of 1990. Finally, describe the lessons learned from the 1972 freeze about leaving stumps untreated to produce the much denser and therefore more fire prone groves that exist today in public and private lands in the East Bay Hills. O6-34
14. The final Hill Campus FM Plan/EIR should include a detailed discussion of topography with over 75% of the Hill Campus having a slope over 40%, and over 90% has a slope over 20%. In our opinion, current fire modeling does not fully address slopes of this degree when combined with extreme weather conditions that are typical during Diablo winds. Therefore, mitigating fire under extreme conditions with dense vegetation and dense adjacent residential areas should be supported and justified by expert knowledge with descriptions factored upward to deal with steep gradients commonly found in the Campus Hills. O6-35
15. The final Hill Campus FM Plan/EIR should clarify the role of winds and topography to make clear that serious and dangerous fires can occur in the UC and East Bay Hills on both up and downslope conditions. the Plan should describe how West wind fires can be dangerous as well for its neighbors without adequate vegetation management.
16. The final Hill Campus FM Plan/EIR should contain provisions that will overcome the FEMA EIS train wreck that began in 2008 that resulted in loss of UC and Oakland grant funds and the prevention of significant fire mitigation project work for 12 years during a period of increasing wildfire risk to expedite work to make the Hill Campus reasonably fire safe.
17. The final Hill Campus FM Plan/EIR should recognize that the fire science in 2010 EBRPD Plan and the 2017 FEMA Plan/EIS was largely not recognized as important by the public or media as an issue to be understood leaving most arguments about saving trees and O6-36

not using herbicides. The UC Hill Campus Plan's vegetation fire hazard descriptions must be accurate and useful to a conflicted public and for university officials who must decide how to make the UC Hills reasonably fire safe. O6-36 cont.

18. The final Hill Campus FM Plan/EIR should address and deal with the two opposing "views" that have been stated by individuals and groups for the East Bay Hills with one view claiming that planted "exotic" vegetation, including eucalyptus and pine are the only fire safe vegetation because SOD will kill all oaks while shrubs and grasslands can produce uncontrollable flames above 40'. The second "view" claims that native vegetation, including oaks and bays are the only fire safe vegetation, and that UC should learn to manage native trees, shrubs, and grasslands in intermix areas especially when near homes.
19. The final Hill Campus FM Plan/EIR should address the fact that social media and blogging about vegetation fire hazards has created a political environment filled with strong views about native and exotic trees, clear-cuts, restoring natural landscapes, fake news about fire hazard myths, cherry picked facts, and media confusion about the role of vegetation fires at the urban/wildland interface and intermix as well as options for managing park and residential vegetation in Very High Severity Fire Hazard Zones in the Oakland hills.
20. The final Hill Campus FM Plan/EIR should deal with the opposing "views" noted above that have created an expectation that all fire hazard plans must pass through litigation involving courts that will require opposing parties to compromise. Past million-dollar fire hazard mitigation plans (EBRPD, FEMA, and UC) have spun off six lawsuits, two settlements and one court decision with combined awards and settlements of $300,000 in public funds, and one ongoing litigation still unresolved. Parties who have not been involved in litigation (like the Conservancy) now know that a final Plan is important background to the eventual decision about vegetation fire hazards that will likely be made in court.
21. The final Hill Campus FM Plan/EIR should describe how the University will work with PG&E to coordinate and update standards for tree separation and limb clearance near powerlines in high-ridge locations with trees above flammable wildland vegetation that can be impacted by Diablo winds. Current standards for trimming of tree limbs and tree removal above Campus vegetation are not sufficient now that major fires have been caused by powerline ignitions.
22. The final Hill Campus FM Plan/EIR should include an area map showing the Cal Fire Very High Fire Hazard Severity Zone including and surrounding the Campus Hills between Tunnel Canyon in the South and the city of Berkeley in the North. Followed by an analysis of current, future, and cumulative impacts of fire hazard mitigation projects and responsibilities for agency wildland vegetation management. The map and analysis must cover project work by agencies owning large areas of vegetation surrounding the Hill Campus including the East Bay Regional Park District and the East Bay Municipal Utility District. The UC Plan/EIR should comment on the adequacy of other agency fuel breaks and project work that are intended to facilitate planned firefighting strategies by the local Fire departments (which by state law are responsible for Local Responsibility Area [LRA] firefighting), and fire code enforcement east of the ridge, and by Cal Fire (which by state law is responsible for State Responsibility Area [SRA] firefighting), and fire code enforcement east of the ridge.

23. The final Hill Campus FM Plan/EIR should address the fact that fire behavior in the past has been based on standard modeling that assumes relative differences in vegetation with flame lengths at the fire front of 0-4', 4-8', 8-11', and above 20'. However, these flame lengths and descriptions do not correspond to what urban residents see on TV during every fire season. The Plan should explain how these projected flame assumptions relate to flames of 100' or 200' that are commonly seen that are 2 to 5 times the height vegetation including flames above the tops of tall trees with embers expanding the fire area across valleys and ridges during a major fire. As an example, a small fire on the Vallejo side near the Carquinez Bridge in November of 2019 jumped the Straits to ignite a fire on the Crockett side during a Diablo Wind event in the East Bay during a period of multiple wind driven fires. O6-37
24. The final Hill Campus FM Plan/EIR should note that a comprehensive Environmental Impact Statement was prepared by FEMA that also covered Strawberry Canyon, Chaparral Hill, and Claremont Canyon areas. It also should describe how the University proposes to deal with the FEMA/EIS and its USFWS Biological Opinion for these three project areas, and for obtaining required permits. The Plan should also state how long it will take the University to complete a Title 10 Habitat Conservation Plan with the USFWS and other resource agencies if required, to obtain permits. O6-38
25. The final Hill Campus FM Plan/EIR should either use or explain why it does not agree with the general concepts of the 3Rs advocated by the Sierra Club and other environmental groups (that seems to me to be consistent with UCs 2020 LRPD Plan policies) about the removal of high fire risk eucalyptus and pine trees, replacement naturally by lower growing and safer natives, and for required restoration of habitat for local native species, including listed species.
26. The final Hill Campus FM Plan/EIR should propose the use of prescribed fire by Cal Fire at some future point in the Hill Campus while recognizing that current use is questionable given concerns about the possibility of losing control of a managed fire and given the operational difficulties of using prescribed fire within urban areas of the Bay Area's challenged air quality system.
27. The final Hill Campus FM Plan/EIR should include in its fire mitigation program and suppression planning a request for the location of an East Bay Hills Cal Fire Unit near the Campus. Currently, the Santa Clara Cal Fire Unit headquarters is located too far South in Mountain View with small fire stations near Sunol and Morgan Territory. Cal Fire's local stations generally have a combination of four fire trucks stationed in the East Bay while local fire departments have about 125 fire trucks with multiple support units. We believe Cal Fire should have a dedicated unit assigned to the VHFHS zoned East Bay Hills near the Campus for rapid response and to assume early command during a major wildfire. O6-39
28. The final Hill Campus FM Plan/EIR should recommend the adoption of specific updated IPM policies and updated University policies that will allow appropriate and safe use of herbicides by trained and licensed employees and by reliable and licensed contractors working on Hill Campus vegetation management projects to implement the final Plan/EIR.
29. The final Hill Campus FM Plan/EIR should recognize that thinning of mature eucalyptus stands will not be a viable strategy for reducing fire hazards in the urban/wildland areas of the Campus. The Plan should report that this strategy is unproven where tree canopies and ribbon bark are impacted on steep slopes by Diablo winds periodically exceeding 40 O6-40

mph. Thinning of pine forests in the Sierra and management of eucalyptus forests in Australia is also commonly combined with a program of regular prescribed burning which has never been done and may not be possible in the UC Hills. Removal of highest-fire-risk trees in the Hills to reduce excessive vegetation fuel followed by treating eucalyptus stumps with an IPM approved herbicide is the only currently available economic and effective strategy in UC's Very High Fire Hazard Severity Zones.

30. The final Hill Campus FM Plan/EIR should recommend removal of all second-growth eucalyptus trees, coppice suckers and seedlings for both fire hazard reduction and economic reasons to allow for the restoration of areas that were logged following the freeze of 1972. By removing the second-growth eucalyptus at a cost range of $10,000 to $20,000 per acre, the University can begin restoration of understory vegetation similar to what was done at Signpost 29 along Claremont Ave on the south side of Claremont Canyon which was done at an average cost of $5,000 per acre between 2000 and 2007. Otherwise the University must expect to fund ongoing long-term costs of $200,000 per acre for retained and managed large blue gum eucalyptus tree groves.
31. The final Hill Campus FM Plan/EIR should also document and include a discussion about the continued risks of retaining large blue gum eucalyptus trees on both the Campus Park area and the Hill Campus. Policies should be developed to address the few remaining beloved, large, and dangerous blue gums that were planted in the early 1870's, and the remaining coppice eucalyptus stems and seedlings that remain after "freeze" logging in the early 1970's. We understand that a University retained arborist recommended removal of 20 large and dangerous trees in the 140 year old West Gate grove, and that a 140 year old eucalyptus tree near the Greek Theater toppled to smash a vehicle on January 6, 2019 killing a young man from Novato. While beautiful, these large trees now represent danger and liability for the University with removal costs likely to be $10,000 to $20,000 per tree. Issues concerning the remaining freeze damaged blue gums on the Hill Campus are discussed in #30 above and elsewhere in this NOP response, but an overall policy and program is needed to also cover all remaining eucalyptus trees to address environmental, fire, student/visitor safety, and liability issues. O6-40 cont.
32. The final Hill Campus FM Plan/EIR should document the fact that the UCB Campus and neighboring communities have been impacted by major fires in 1905, 1923, 1970, 1991, and by many smaller fires that occurred under "normal" conditions. However, the final Plan/EIR should include a case study that will clarify the facts surrounding the recent UC Grizzly Peak Fire of August 2, 2017. And then provide appropriate science-based policies to address recommendations for vegetation management, for appropriate ridgetop and hillside fire mitigation, and for fire suppression strategies for no wind fires as well as for more destructive Diablo wind fires.
33. The final Hill Campus FM Plan/EIR should include a case study of the August 2nd fire as a recent sample about what should have been a simple fire on a no wind day without the weather conditions that signal a red flag warning. It turned out to be an arson fire that burned uphill toward Grizzly Peak Boulevard where it should have been controlled by firefighters. The only area where fire control was possible along the road was on the south side of the fire where UC had earlier removed two groves or eucalyptus trees allowing control to be established by first responding units on Grizzly Peak Boulevard along the joint EBRPD/UC ridgetop fuelbreak system. However, control was not possible along the North side of the fire because fire blew through pine trees and dense

eucalyptus groves on UC land where removals were "on hold" because of the FEMA EIS 10-year train wreck, and then blew through EBMUD's thinned eucalyptus grove on Grizzly Peak. Unfortunately UC and EBMUD had not established a joint ridgetop fuelbreak along this section of the high ridge. Of course, fire and embers blew through EBMUD's thinned grove into the South end of Tilden Park where campers and visitors to the train concession were evacuated. Because of dense vegetation in Tilden Park, Cal Fire aircraft were required to drop retardant slurry until days end to control the many spot fires in the park. See the following Summary of The Grizzly Peak Fire of August 2, 2017 using quotes from selective news articles

34. The final Hill Campus FM Plan/EIR should document the fact that the University of California at Berkeley has an enormous responsibility as a leader in science-based education in many subjects including forestry, natural resource protection, and urban/wildland fire mitigation for its campus and for its adjoining and neighboring communities. The University is clearly not a self-contained vegetation island. Its immediate neighbors, EBRPD and EBMUD, contain extensive wildlands with very substantial fuel loads of highly flammable and invasive vegetation. The EIR will need to address the "cumulative impacts" of fire safety for the campus and the major land ownerships of wildlands in the East Bay Hills. Diablo Winds come from the North East and LBL has modeled the potential for a 60 ft high wall of wildfire coming from Tilden blowing into the Hill Campus. The EIR will need to address how the University's fuel management plans interact with and have been coordinated among the major wildland ownerships in the East Bay Hills. The wildlands wildfire threats in the East Bay Hills are present at an areawide scale, and they must be addressed at this large scale. Especially after the major wind driven siege of fires during 2017, 2018, and 2019 followed by PG&E's newly implemented PSPS program of power shutoffs. O6-41
35. The final Hill Campus FM Plan/EIR should also address the fact that the Campus was developed in 1873, and that it has been surrounded by dense urban development and dense wildland vegetation with increasing flammability that now represent significant liability and insurance risks from future wildfires for both the campus and its neighbors.

Summary of The Grizzly Peak Fire of August 2, 2017 using quotes from selective news articles

A fire broke out on Grizzly Peak, northeast of the UC Berkeley campus, early Wednesday afternoon, leading to the evacuation of nearby university buildings and a dramatic overnight scene as hundreds of firefighters worked tirelessly to keep the inferno from spreading.

The five-alarm burn encompassed 20 acres at its largest, although come Thursday morning KTVU reported that it was half contained, up from the 20 percent that the Alameda County Fire Department reported on Twitter the previous evening.

UC Berkeley ordered the Lawrence Hall of Science, the Mathematical Sciences Research Institute, and the Space Sciences Laboratory evacuated around 3 p.m. on Wednesday, says the LA Times. It was a voluntary evacuation, engaged as a precaution rather than because of immediate danger.

But the East Bay Hills dodged an incendiary bullet for another reason, Scott Stephens says: On the day the fire ignited, the weather was mild and a west wind was blowing, more or less pushing flames away from Berkeley Lab and the UC Berkeley campus. If the fire had started on a hot day with an east wind—the conditions that prevailed during the disastrous Oakland Hills fire of 1991—things might have concluded tragically.

I try not to promote draconian scenarios, but I am concerned about them," Stephens says. "A fire driven by a strong east wind on a hot day would've acted very differently. It not only would've burned very quickly, but where particularly volatile fuels such as eucalyptus are concerned, it would have thrown embers miles ahead, starting hundreds of spot fires that would also burn explosively and merge. That's what happened in 1991.

Normally, wildfires burn more rapidly uphill than downhill, observes Stephens, but in extreme conditions such as those that characterized the Oakland Hills Fire, "the fire overwhelms the topography. If last week's fire had occurred under Oakland Hills fire conditions, there would've been impacts to university property. I'm particularly concerned about the Clark Kerr campus dormitories. They seem at significant risk."

By HARRY HARRIS | hharris@bayareanewsgroup.com | Bay Area News Group
PUBLISHED: August 2, 2017 at 1:32 pm | UPDATED: August 15, 2017 at 12:33 pm
BERKELEY — Dozens of firefighters from several agencies battled a multi-alarm grass fire Wednesday afternoon that spread into Tilden Regional Park in the Berkeley hills and grew to 20 acres, authorities said.

One hundred children attending Gillespie Youth Camp in the park were safely removed and the popular Steam Train ride in the park was closed and visitors also removed, said East Bay Regional Park District Fire Chief John Swanson

The blaze burned on both sides of Grizzly Peak Boulevard and had consumed about 5 acres in early estimates. By 6 p.m., it had grown to 20 acres, Moraga-Orinda Fire Chief Stephen Healy said, with half of the fire in Oakland and the other half in Berkeley by the Lawrence Berkeley National Laboratory.

Authorities recommended evacuations of the Lawrence Hall of Science and two other nearby buildings, as well as portions of the Lawrence Berkeley National Laboratory. Power was going to be cut off to UC Berkeley when PG&E required transformers to be shut down, officials said in an advisory at about 2:45 p.m. As of 4:15 p.m. power was still on at the UC campus.

In the first hours of the blaze, aerial drops of water and retardant were dumped on the flames and hot spots, and bulldozers were being used in the effort. Firefighters on the ground were warned of the potential of falling trees that were damaged in the fire.

Though trees remained a danger Wednesday afternoon, fire leaders saw indications the blaze was slowing and partially under control. Initially, three air tankers and two helicopters were used to fight the fire, but only one air tanker and one helicopter remained by 4:30 p.m., Swanson said. Fire lines were built to contain the blaze.

About 150 to 200 firefighters from Oakland, Berkeley, East Bay Regional Park District, Cal Fire and Moraga-Orinda and Contra Costa County Fire and Alameda County Fire were on the scene. Cal Fire, Moraga-Orinda and Oakland will remain on the scene overnight.

DAN GRASSETTI REPLIED ON AUGUST 8, 2017 - 10:41AM PERMALINK
One has to wonder whether Professor Stephens actually visited the site of this fire before providing his expert assessment. What happened at this site was the majority of this fire occurred on UC land that HAD BEEN TREATED by UC several years back. Did this treatment prevent a fire? Absolutely not. Did this fire burn voraciously? Yes. At the northern end of the site was an area that had not been treated by UC. As a result of the intact tree canopy there were fewer ground fuels, but the ground fuels that were there did burn. But the eucs and pines at the site DID NOT BURN. On the other side of the street is an EBRPD site where there is a euc grove with aggressively managed understory. While the fire spread to the area just to the north of this site, where the understory had not been managed, there was ZERO SPREAD of the fire in the euc grove with managed understory. This is what's called a shaded fuel break. It worked. While Professor Stephens failed to mention these details, he did opine on how much worse this could have been had the winds been stronger. This is no doubt true, but the same basic dynamics apply. Where there are understory fuels there will be fire and where there are little or none it's highly unlikely there will be fire. As to concern about crown fires one can't speak of this risk in isolation. i.e.. while a crown fire in a euc grove would be difficult to manage, the far greater risk is a crown fire in vegetation with a high percentage of "fine fuels" (<3" in diameter) and with crown at or near ground level. A prime example of such a species is the bay tree. Other agencies in this area have recognized this threat and are limbing up bay trees to eliminate this hazard. While Professor Stephens might argue that what happened last week was anomalous, the reality is that it wasn't. We've toured every wild land fire in this area since '91 and the results have been nearly identical. All the ground fuels burn and few if any of the tall trees burn. Eucs seem particularly resistant to ignition due to their high moisture content and the fact that their crowns are very high above ground level. One might almost get the idea that they evolved to be resistant to fire. As to Tom Klatt's role in putting up signs, yes this is a good thing. But the bigger issue is that ever since UC cleared out all the tall trees that were blocking views and expanded the pullouts along Grizzly Peak there have been a series of fires started by revelers who have been using these facilities. We think it high time that UC accept responsibility for the increased risk and create vegetation free zones around these pullouts so that what happened last week is less likely to happen in the future. In short, as Mary McAllister wrote, the reality on the ground simply doesn't support Professor Stephen's conclusions.

BOB ROBERTS REPLIED ON AUGUST 8, 2017 - 5:08PM PERMALINK
This is ignoring the fact that a grass fire can be fought. Once a fire reaches the tree canopy and becomes a crown fire, all one can really do is watch it burn, especially in forests where canopies are fairly closed (oak woodlands generally have distance between trees that reduce the likelihood of this happening). As the leaves and branches high in the canopy burn and float through the wind, they create hot spots (especially near houses, when they fall on roofs or gutters). As Dr. Stephens as noted, eucalyptus are notorious for spreading embers in this fashion over vast distances. Minimizing the opportunity for a fire to crown is key. Logs on the ground are not ideal but they do not really facilitate crowning. Had that fire crowned, all the trees would

have died. It is likely many people would have as well due to the close proximity to large office spaces. Oaks are also a long-lived species adapted to this ecosystem. Nearly all the Monterey pines in this are dead or dying before they reach 100 years old due to western gall rust. Eucalyptus are showing similar mortality issues (look at UCSF or the grove on the UC Campus) due to a butt rot disease that rots them from the inside. These trees will die, and research has shown they are not regenerating themselves, either. Should we be managing to make sure we have the best chance of having forest there in the future by promoting the naturally vegetated condition, which also provides the best balance of nice areas for recreation, wildlife habitat, and safety; or should we just leave it until the "big one" hits and the whole ecosystem is annihilated?

MARY MCALLISTER REPLIED ON AUGUST 9, 2017 - 6:31AM PERMALINK
The grim scenarios described by both Stephens and Roberts are entirely speculative AND they have nothing to do with reality. In fact, the fire did NOT spread into the tree canopy, nor did embers start spot fires. The 1991 fire was a wind driven fire that did ignite tree canopies, but they ignited ALL species of trees, including oaks and redwoods. Read Margaret Sullivan's book, Firestorm, based on interviews with witnesses of that fire for confirmation of that FACT. The FEMA Technical report on the '91 fire said embers that started spot fires were from "brush." A US Forest Service study of embers cast by wildfires all over the world said that the only identifiable ember in the '91 fire was a cedar shingle from one of the burned homes. Oaks do not live longer than eucalyptus. US Forest Service tree database says coast live oaks live about 200-250 years. Blue gum eucalyptus live in Australia from 300-500 years. They haven't been here that long, so we don't how long they will live here, but certified arborists with no nativist bias say they are healthy here and they expect them to live another 100-200 years. Quotes from the Presidio forester confirm that FACT. In contrast, many of our coast live oaks are being killed by Sudden Oak Death. A study published in April 2015, predicted that all coast live oaks in California would eventually be killed by SOD. Inform yourselves of the FACTS before spinning scary tales.

Note: The unpublished background paper *DIABLO WINDS, WILDFIRES, AND FLAMMABLE VEGETATION IN THE EAST BAY HILLS*- by Jerry Kent, September 2017 is included here for the record, as an attachment providing relevant history and background with reference's that proceed the development of the Hill Campus FM Plan/EIR.

Note: The before and after aerial photos mentioned in #13 about the 1972 freeze and the eucalyptus tree removal logging that occurred on UC's Strawberry and Claremont Canyons, EBRPD's Tilden Regional Park, EBMUD's Siesta Valley, and by Oakland in several areas of the city are provided here for the record, and attached.

Letter O7

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October 5, 2020

UC Berkeley, Physical & Environmental
Planning
Attention: Raphael Breines, Senior
Planner
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Berkeley, CA 94720-1382

Re: Draft EIR Comments: WVFMP

Dear Mr. Brienes:

This letter is provided on behalf of my client, the Claremont Canyon Conservancy ("Conservancy"), to provide comments on the University's Draft Environmental Impact Report ("DEIR") for the above-referenced Wildland Vegetation Fuel Management Plan ("Plan") for the University of California, Berkeley's Hill Campus, located in the Oakland-Berkeley hills above and east of the University's main campus. The Conservancy will also be writing separately to provide its comments on the Plan itself, which still needs significant improvements if it is to meet the Plan's intent of significantly reducing the risks from wildfires in the Plan area.

In our view there are impacts that have not been adequately addressed in the DEIR, and some of these impacts should cause the University to reconsider the range of alternatives analyzed in the EIR. In particular, the EIR should accurately analyze the long term environmental and fire risk benefits of the proposed Alternative A, submitted by Professor McBride, including that alternative's recommendation that the Plan's fuel reduction approach should commit to removing eucalyptus and Monterey pine ("pine"), rather than simply 'thinning' these species that pose such a high degree of fire risk. Based on the flaws to be identified in this letter, the Conservancy feels it is imperative that the University consider options beyond those identified in the DEIR. Because that will significantly affect the analysis presented in the DEIR, the Conservancy suggests that a revised EIR adopting a more complete and robust eucalyptus/pine removal strategy as the preferred alternative will need to be recirculated for additional public comment. O7-1

A. The DEIR Fails to Adequately Describe the Environmental Setting.

A central CEQA requirement is that the environmental review document contain a full description of the 'environmental setting' in which the project will occur. 14 Cal. Code Reg. § 15125; San Joaquin Raptor v. County of Stanislaus (1994) 27 Cal. App. 4th 713, 722, 726 ("[I]nadequate consideration and documentation in the EIR of existing environmental conditions rendered it impossible for the [EIR] to accurately assess the impacts the project would have...") O7-2

In this case, the overall description of the environmental setting in the DEIR is inadequate in two key respects.

First, the DEIR fails to discuss adequately the existing setting that is being currently and will in the future be shaped by accelerating climate change. Due to this failure, the DEIR's analysis fails to fully consider the impact of the Plan in conjunction with reasonably foreseeable future effects of climate change on the Plan area. It is far past debate that global climate change is no longer just a theory about potential future changes. Climate change is already happening, and its effects are evident on almost an every day basis to even the casual observer. Those effects, as they apply to the Plan area include a shorter, but likely more intense, winter "rainy season." Conversely, they also include a longer, warmer, and drier summer/fall "dry" season.

Wet winters and dry summers are well-established characteristics of the Bay Area's Mediterranean climate regime. Climate change is making those seasonal changes more extreme, and tilting them in the direction of a longer and hotter dry season. In particular, the earlier end to the rainy season and the warmer, drier conditions during the summer/fall dry season will predictably mean that vegetation in the Plan area will become drier and more combustible than it has in the past. In addition, plant species that are not well adapted to warm and very dry conditions ("drought tolerant" plants) will not be able to maintain their health and will therefore be more subject to stress, disease, and potential early death. The DEIR does not take these reasonably foreseeable changes into account in evaluating the future fire risk of allowing the current mix of plant species to remain "as-is" in the Plan area. It should be noted that the "future" here is not fifty or a hundred years ahead. As the events of the past few years have shown, significant climate change is already happening, and can only be expected to increase in speed and severity over the next twenty years, well within the timeframe of this Plan's implementation[1]. O7-3

Of particular concern are species that are currently present as large populations and could provide large amounts of fuel for wildfires. The most significant of these is the blue gum eucalyptus. While this introduced species, coming from Australia, is well adapted to warm climates, it is not particularly drought tolerant. (See, https://plants.usda.gov/java/charProfile?symbol=EUGL [accessed 9-19-2020 "drought tolerance = low"). Further, its moisture use is high (*Id.*), so it will tend to dry out the soil around its roots. (See, K.M. Wolf and J.M. DiTomaso, Management of blue gum eucalyptus in California requires region-specific consideration, Calif. Agriculture 70(1):39-47- http://calag.ucanr.edu/archive/?article=ca.v070n01p39 at p. 43.) (hereinafter " Management of blue gum eucalyptus in California.")

Second, the DEIR fails to adequately describe the past history and resulting current occurrences of eucalyptus and pine in the project area, including but not limited to 1) the specific density and size of eucalyptus and pine groves in the project area; and 2) the relevant success or failure of past efforts to limit eucalyptus and/or pine through thinning versus removal, and how those past efforts relate to the present distribution of these high fire risk species within the project area. For example, the DEIR (p. 2-9) states that treatments "would be primarily implemented in areas where eucalyptus trees were previously removed but regrowth occurred because of ineffective follow-up treatments." This raises a substantial question not addressed in the DEIR as to how and why prior efforts to thin or remove eucalyptus have or have not been successful, including a lack of discussion about which 'follow-up treatments' were utilized and why these treatments were 'ineffective[2].' O7-4

[1] An additional factor not addressed in the DEIR is fire ignition by lightning strikes. While heat lightning (lightning not accompanied by heavy rain) has been uncommon in the Bay Area, this summer's devastating lightning strikes indicate a new risk from climate change – the migration of tropical storms north from Mexico, accompanied by an abundance of lightning. Such lightning strikes are most prevalent on ridgelines, and especially to tall trees like eucalyptus and Monterey pine. This is an additional reason to make removal of these species from ridgelines a top priority.

[2] Presumably, an ineffective treatment is one that allows the removed species to quickly re-establish themselves.

Together, these deficiencies in describing the Project setting skew the DEIR's impact analysis and selection of a preferred project alternative. As discussed below, although the Plan targets eucalyptus and pine in the project area for removal as a fire hazard, it also provides UCB with the option of simply thinning these species, which will likely not be effective in reducing fire risk and may even increase such risk over the long term as these species – particularly eucalyptus – fill in the spaces created by the project's removal of other understory vegetation identified as a fire risk. With the expected increase in summer temperature and decrease in moisture availability, that will be an even more important factor in the future. Further, given its susceptibility to drought, eucalyptus' value for the permanent sequestration of CO_2 is questionable compared to other tree species – particularly long-lived and non fire-prone species such as oak and redwood – especially because its high oil content and ease of ignition when dry make it highly susceptible to incineration and CO2 release in a wildfire. *(See* Management of blue gum eucalyptus in California at p. 42.) O7-5

B. The DEIR Does Not Provide An Adequate Project Description.

CEQA requires a full and accurate description of the project to ensure a meaningful evaluation of environmental impacts. See e.g., Mira Monte Homeowners Assn. v. County of Ventura (1985) 165 Cal. App.3d 357, 366; Santiago County Water Dist. v. County of Orange (1981) 118 Cal. App.3d 818, 829-831; County of Inyo v. UCB of Los Angeles (1977) 71 Cal. App. 3d 185; 14 Cal. Code Reg. § 15124. As the County of Inyo court noted:

> Only through an accurate view of the project may affected outsiders and public decision-makers balance the proposal's benefit against its environmental cost, consider mitigation measures, assess the advantage of terminating the proposal (i.e. the "no project" alternative) and weigh other alternatives in the balance. An accurate, stable and finite project description is the sine qua non of an informative and legally sufficient EIR.

71 Cal. App. 3d at 192.

The DEIR does not provide adequate information about the project, including the nature of treatment being proposed. For example, the DEIR states that fire hazard reduction treatments would focus on reducing hazardous fire conditions in the Plan Area, and that UCB "would evaluate trees and shrubs for vertical and horizontal spacing; remove tall, unhealthy, structurally unsound or highly flammable trees that are likely to torch and distribute embers; and remove short understory trees," including a host of 'criteria' that essentially provide UCB unlimited discretion as to which trees to remove, or whether to focus on thinning as opposed to removing the high fire risk eucalyptus and pine. *See* DEIR, p. 2-9. Elsewhere, the DEIR proposes 'vegetation treatment activities' including manual treatment, mechanical treatment, prescribed broadcast burning, managed herbivory (livestock grazing), and targeted ground application of herbicides, each of which may be used to implement treatment types within the Plan Area. *Id*. The DEIR states that 'vegetation treatment types would be implemented using various combinations of the treatment activities, which ''would be those that are most likely to achieve the desired treatment objectives for the specific site, protect natural resource values, and meet the overall Plan objectives,' and which 'best match the operational needs and treatment constraints on the landscape.' *Id.* O7-6

This type of open-ended description of how fuel reduction activities will be conducted does not meet CEQA's requirements of an adequate project description, as discussed above, which in turn undermines the DEIR's analysis of impacts and alternatives, as well as the Plan's ability to achieve the project objectives to avoid or substantially lessen fire risks in the future.

In *Stopthemillenniumhollywood.com v. City of Los Angeles* (2019) 39 Cal. App. 5th 1, an EIR for a development project state did not adequately identify the project that would eventually be constructed. Instead, the EIR presents different conceptual scenarios that Millennium or future developers may follow for the development of this site. These concepts and development scenarios-none of which may ultimately be constructed-do not meet the requirement of a stable or finite proposed project. The development regulations that were incorporated into the project description provide the public and decision makers little by way of actual information regarding the "design features" or the "final development scenario."

Id. at 1. *Stopthemillenniumhollywood.com* rejected the EIR's approach, noting that the "problem with an agency's failure to propose a stable project is not confined to 'the informative quality of the EIR's environmental forecasts...Rather, a failure to identify or select a project at all 'impairs the public's right and ability to participate in the environmental review process.'" Id. (citing *Washoe Meadows Community v. Department of Parks & Recreation* (2017) 17 Cal.App.5th 277, 286-287.) O7-6 cont.

Here, as described below, the lack of parameters about how the project ultimately will treat eucalyptus and pine raise the possibility of significant impacts that may be caused by this project as compared to the existing environmental conditions, as well as skewing the DEIR's alternatives analysis by never comparing a project option that requires eucalyptus and pine removal, as opposed to one (the proposed project) which hedges on its commitment to remove these highly flammable species from the landscape.

C. The DEIR Does Not Analyze the Potential Adverse Impacts of Leaving Eucalyptus and Pine on the Landscape within the Project Area.

The DEIR does not provide adequate information about the potentially significant adverse effects due to increased fire risk over time, as well as impacts to existing native vegetation communities, of retaining eucalyptus and pine on the landscape following completion of the largely discretionary fuel reduction activities proposed for this project.

Here, as discussed, the Plan provides UCB with considerable discretion to retain eucalyptus and pine on the landscape, based on a series of essentially standardless criteria relating to tree size, health, flammability etc. However, neither the Plan nor the DEIR discuss the foreseeable likelihood that retaining these invasive species on the ground, in conjunction with substantial removal of native understory vegetation, will lead over time to an *expansion* of these species within the project area, thereby increasing fire risk in the future while also reducing habitat for wildlife species that depend on native vegetative communities[3]. O7-7

As the DEIR acknowledges, without substantive discussion, prior attempts to reduce the prevalence of eucalyptus or pine through thinning or even removal have failed. The DEIR provides no discussion, however, regarding the success of these efforts or how the Plan's undisclosed approach to reducing the proliferation of these high fire risk species will be successful. In particular, the DEIR does not acknowledge the foreseeable result that retention of a percentage of eucalyptus or pine leads to significant impacts due to the ability of these species particularly blue gum eucalyptus to spread as an invasive species:

> [E]stablishment of blue gum in undisturbed forests and scrub has been observed repeatedly in coastal areas of California (Cal-IPC 2015), and young trees can produce seeds within 2 to 5 years of germination, although not in great quantities (Burns and Honkala 1990; Metcalf 1924). ... Vegetative reproduction can also contribute to invasive potential, making control or removal difficult. Blue gum sprouts readily from stumps of all sizes and ages, as well as from the lignotuber (woody swelling of the root crown at or below ground level) and roots. Blue gum

[3] Particularly when considering listed species, such as the Alameda whipsnake, maintaining the ecosystem to which it is adapted is far preferable to disrupting that ecosystem with alien species, particularly when those species have allelopathic effects.

> lignotubers can survive for many years in the soil after stems die back (Esser 1993; Skolmen 1983). If a tree is cut down, lignotubers become active and each bud may produce many new shoots, commonly known as "sucker growth" or coppice shoots (Bean and Russo 2014; Davidson 1993), which may be even more vigorous and difficult to control than the original growth (Farmer 2013)

See Management of blue gum eucalyptus in California at pp. 40-41.

Any retention of eucalyptus or pine will occur within the overall Plan's scope of removing substantial amounts of existing understory and/or competing trees, which will create relatively unoccupied habitat for eucalyptus or pine to occupy over the next decade and beyond. The potential in particular for blue gum eucalyptus to spread into adjacent habitats is well known:

> In most cases, establishment of new populations in California wildlands is dependent on proximity to previously planted or otherwise established, seed-producing stands. Ritter and Yost (2012) noted that blue gum of the same genotype can be invasive in some areas... invasiveness ...appear[s] to be related to ...environmental conditions, particularly reliable access to water. In the Central Valley, where blue gums were cultivated as a source of fuel, timber and windbreaks, they do not receive enough moisture to propagate from seed (HEAR 2007) and, as such, spread into wildlands is generally rare. Under ideal conditions where moisture is not limited, once a tree matures it can produce a large number of progeny in a few years, doubling stand area within 10 years, or spreading at a rate of 10 to 20 feet (3 to 6 m) in diameter per year (Boyd 1997; Esser 1993). Coastal California ... is most at risk for the continued spread of blue gum.

Id. at p. 45. *See also* McBride, J.R., N. Sugihara and D. Amme. 1987. Vegetation Assessment. In: D. Boyd (Ed.) Environmental assessment for Eucalyptus Removal on Angel Island. California Dept. Parks and Recreation, Sacramento, CA. pp 23 (eucalyptus expansion increased on road cuts where competition from annual grasses had been eliminated.) O7-7 cont.

Given that the DEIR does not define or set the parameters for how or in what percentage eucalyptus and pine may be removed, one may assume for purposes of impact analysis the possibility that a not unsubstantial portion of these species may be retained on the landscape. In combination with the understory vegetation removal that will occur, this creates the significant and foreseeable potential for these species -- particularly eucalyptus -- to expand both in density and land occupied, thereby causing significant impacts on the environment:

> [B]lue gum appears to alter historical abiotic conditions and ecosystem. Without removal of blue gum, plant community composition is not likely to support historic community composition. Even with removal, treatments must be repeated multiple times due to resprouting or new flushes of blue gum seedlings (LSA Associates 2009), resulting in continued disturbance.

Management of blue gum eucalyptus in California at 43-44. As discussed, and as recognized in the DEIR and other Plan documents. This spread of highly flammable and invasive species may greatly increase fire risk as well as displacement of native vegetation and wildlife within the project area:

> In addition to being generally more ignitable and highly flammable in comparison with some species, blue gum accumulates more fuel for wildfires than grasslands and native tree species. Blue gum can accumulate 68,000 pounds per acre (lb/ac) of dropped limbs, bark and leaves (76,000 kilograms/hectare [kg/ha]), compared to 42,000 lb/ac (47,000 kg/ha) for California bay (Umbellularia californica (Hook. and Arn.) Nutt.) and 26,000 lb/ac (29,000 kg/ha) for coast live oak (*Quercus agrifolia* Née; also called "California live oak") (NPS 2006). As a result, blue gum stands are particularly susceptible to fire during the

dry season in California. The flammability of blue gum leaf litter may be exacerbated by rare deep freezes, which cause die-back of the trees and contribute to fuel loads (Rejmánek and Richardson 2011).

Blue gum also has a tendency to propagate fires via open tree crowns and long swaying branches that encourage maximum updraft (Esser 1993; LSA Associates 2009). Multiple stems originating from a single trunk create a basket structure that catches dead materials, which burn easily and intensely (Burns and Honkala 1990; Landrum 2013). When ignited, leaves and bark of blue gum are lofted into the air, sending firebrands (fragments of burning wood) "kilometers" from the fire front to ignite new spot fires. Because leaves and bark firebrands are large, embers are generally still burning when they land, which can rapidly increase fire spread (Rejmánek and Richardson 2011). O7-7 cont.

Overall, blue gum has a high fire hazard rating in comparison with native grass and tree species, which have low to moderate ratings (LSA Associates 2009). In summary, blue gum is highly ignitable and flammable, accumulates high fuel loads, propagates fire quickly, and can increas rate of fire spread to adjacent areas. In fact, the National Park Service (2006) estimated that 70% of the energy released through combustion of vegetation was due to blue gum in the deadly 1991 Oakland hills fire.

*Id. a*t pp. 41-42.

D. The DEIR Properly Rejects Alternative B, Which Calls for the Retention of Large Eucalyptus and Pine on the Landscape within the Project Area.

Alternative B proposes the retention of large eucalyptus and pine on the landscape based on the theory that these non-native species provide habitat for native wildlife. However, substantial evidence demonstrates that forests dominated by these species are depauperate in wildlife diversity ranging from invertebrates to vertebrate species ranging from reptiles and amphibians to native songbirds[4].

Alternative B also does not address the build-up of brush and plant detritus (e.g., dead leaves, dropped branches, shed eucalyptus bark strips, etc) that will be exacerbated by the future effects of climate change in the Plan area. During the dry summer and fall months, these greatly increase fuel load and, when very dry, greatly increase fire intensity, leading to damage and death of mature trees even when the trees are not actually consumed by the fire.

The Plan calls for removal of this fuel build-up by a variety of treatments, ranging from hand clearance to controlled burns. The former can only provide limited control because it is slow and expensive. The latter, while potentially fast and effective, is of limited value because it cannot be applied safely when the fuel load is already high. In other words, it may be effective for maintaining areas that already have low ground fuel load, but cannot safely reduce the ground fuel load in areas with a high ground fuel load. O7-8

As the Plan notes, mechanical clearance can be effective in reducing ground fuel load. Given the need to reduce ground-level fuel as climate change continues to increase the summer and fall fire risk in the Plan area, mechanical clearance of areas with high levels of ground fuels, particularly those most at risk for wildfire ignition or spread during periods of Diablo winds, should be given high priority. From that standpoint, Alternative B, the reduced treatment alternative, will be even more ineffective in reducing future fire risk than is stated in the DEIR.

As the DEIR notes, Alternative B would only employ manual treatment activities to remove high fire risk fire fuels – primarily ground-level fuels. It would not involve

[4] This may well relate, in part, to the well-known allelopathic effect of blue gum eucalyptus on the understory plant community of eucalyptus groves and forests.

removal of eucalyptus except perhaps those in the immediate vicinity of evacuation routes where they might interfere with use of the evacuation route in an emergency.

The DEIR notes that because it would reduce the intensity of fuel removal treatments, Alternative B would reduce the impacts associated with those activities. However, as the DEIR also notes, the reduced activities would also reduce the effectiveness of Alternative B in reducing the risk of wildfires and their spread, particularly wildfires associated with Diablo wind conditions. Consequently, under Alternative B, such fires would continue to occur, and as climate change effects on the Plan area continue to increase, so would Diablo wildfires and their impacts. O7-8 cont.

As discussed, because Alternative B would remove only fine fuels and ground fuels, but would not remove eucalyptus, new eucalyptus would continue to sprout in and around areas of current eucalyptus groves where their growth might have been inhibited by existing ground fuels and brush, causing those groves to increase in density of eucalyptus growth and spread even more than would happen under the No Project Alternative.

Further, because the denser eucalyptus groves under Alternative B would consume more soil moisture than under the No Project alternative, over time, with the intensification of climate change, Alternative B would result in drier conditions in areas of eucalyptus, increasing the fire risk of those areas compared to the No Project Alternative. Because the increased eucalyptus density, especially smaller diameter immature trees, would increase the fuel load in eucalyptus areas, fires in those area would also be more intense than under the No Project Alternative, and that intensity would increase as the intensity of climate change effects increased over time.

As a result, Alternative B, over time, would result in more intense and larger wildfires, especially wildfires occurring under Diablo wind conditions. This, in turn, would result in more severe fire-related impacts, including loss of animal and plant species and their habitat, destabilization of soils and increased erosion, and potentially increase frequency and intensity of landslides due to loss of the stabilizing effects of root systems in holding soils in place and absorbing rainfall. Consequently, Alternative B would have vastly increased indirect impacts compared to the No Project Alternative. O7-9

A further concern raised by the foreseeable increasing effects of climate change in the Plan area is that trees not well-adapted to the longer and warmer dry season will be placed under increased stress, particularly in the Fall, at a time when the fire risk reaches its maximum with the occurrence of Diablo winds. It is well known that drought stress increases trees' susceptibility to disease and insect damage. Such damage often increases a tree's flammability and susceptibility to fire damage.

As discussed, to address this risk, the EIR should discuss a more directed replacement of removed tree species with species expected to be well adapted to the effects of climate change. Both the coastal live oak and the California bay tree are reasonably drought tolerant, with leaves that can reduce transpiration during dry conditions. O7-10

E. The DEIR's Rejection Of Alternative A Does Not Account For The Adverse Fire Risk And Ecological Effects Of Retaining Eucalyptus And Pine Within The Project Area, Thereby Allowing For The Spread Of These High Fire Risk Species.

The DEIR errs in its rejection of Alternative A in that it does not address the critical difference between this alternative and the proposed project (as well as Alternative B). Here, unlike the Plan or Alternative B, Alternative A calls for replacement of virtually all eucalyptus in the Plan area with lower fire-risk vegetation. It also calls for improvements in fire protection infrastructure, notably, placement of on-site water tanks for use in fire control and purchase of two "Type 3" fire trucks capable of traversing fire roads within the Plan area after their improvement to handle these trucks. In addition, it O7-11 calls for establishing fire detection cameras capable of monitoring the entire Plan area to detect ignition events.

Treatments under Alternative A would be similar to those under the Plan, with the exception that no controlled burns are proposed. However all biomass created by treatment methods would be removed from the treatment sites and disposed of at a central location. While this might, under some circumstances, increase the amount of smoke produced, it would reduce the risk of left-behind chipped wood waste drying out and increasing the fuel load and fire intensity. That risk will only increase over time as climate change progresses. Balancing those two potential impacts, a risk of somewhat higher smoke production during tree waste disposal is greatly outweighed by the risk of more intense wildfires (which would also produce intense smoke.) A major difference from the Plan is that the removal and replacement of eucalyptus and other high fire risk and invasive plant species would be *required*, whereas under the Plan, such removal would not be required, but only optional, based on an ill-defined and often subjective set of criteria, thereby leading to the potentially significant impacts described above in Section C.

Because it would fully eliminate areas of eucalyptus and Monterey pine, and would include wider firebreaks less likely to be jumped under Diablo wind conditions, Alternative A would be superior to the Plan in reducing wildfire risk, particularly under Diablo wind conditions. Alternative A would also be superior to the Plan through its commitment to removing the allelopathic eucalyptus and pine that greatly reduce habitat value and native wildlife and plant diversity where these species become established. O7-11 cont.

While some aspects of Alternative A go beyond simply vegetation management (e.g, purchase of fire trucks and video surveillance equipment) the DEIR disregards these additional proposed activities. However, the question is whether the purpose of the Plan is solely to conduct vegetation management activities or if it to improve the protection of the Plan area from the risk of wildfire. Here, the Plan's objectives include:

- Increase the Plan Area's resistance to catastrophic wildfire to reduce the potential for loss of human life and property damage from wildfire;
- Enable UC Berkeley staff to make informed and adaptive management decisions that are cost effective and environmentally sustainable.
- Maintain an active role in regional efforts to reduce wildfire hazard in the East Bay hills,

These additional components to Alternative A are appropriate and clearly within the scope of the project objectives to reduce wildfire risk and ensure public safety. Because Alternative A would reduce fire risk by eliminating eucalyptus and pine within the project area, thereby also avoiding the spread and increased fire risk of these species, as well as improving native habitat for wildlife, it should be considered the environmentally superior alternative and adopted as the preferred alternative for this project. .

In addition to these general comments on the DEIR, the Conservancy has the following more specific comment on the Plan and its DEIR:

Wildfire Modeling – The Plan upon which the DEIR is based was developed using computer modeling to predict the characteristics of a potential wildfire under varying conditions. (Plan at pp. 35-56.) Modeling was done using both a fuel model (Plan at pp. 35-38) and fire behavior modeling using FlamMap 6.0 (Plan at pp, 38-56). However, the DEIR never examines the accuracy of the modeling upon which the Plan is based. It merely assumes the methodologies specified in the Plan and evaluates impacts from applying those methodologies. O7-12

The fuel modeling characterized the vegetation in the Plan area as falling within one of a number of different "fuel types," each of which is associated with a set of fire characteristics, depending on the conditions for the fire (e.g., slope, temperature, relative humidity, wind speed and direction). However, neither the Plan nor the DEIR provide any evidence supporting validation of the modeling results – that is, checking model predictions under a certain set of conditions against actually observed fire characteristics under those conditions. Equally important, no evidence or data is presented showing that if validation was done, it was done under conditions similar to those that would actually occur in the Plan area.[5] Without this kind of validation data, it is impossible to know whether the modeling gives accurate predictions, and therefore whether the expected effectiveness of different treatment methodologies actually bears any relationship to what would happen in reality. O7-12 cont.

Conclusion

The Conservancy requests that UCB address the issues raised above, particularly its decision not to commit to the full removal of blue gum eucalyptus and Monterey pine in the project area. This analysis should clarify the project description with respect to the removal of these invasive and high fire risk species, assess the impacts of not doing so, and reconsider the DEIR's rejection of Alternative A in the context of this discussion. O7-13

Sincerely

Stuart Flashman

[5] It should be noted that most of the references to modeling of fire behavior date to 2006, and do not appear to be specific to the Plan area.

Letter O8

10/5/20

Response to UC Hill Campus Vegetation Management Plan by the Claremont Canyon Conservancy

The New Reality

The increased number and severity of wildfires in California over the past three years illustrates that we are in a new reality. Hotter summers combined with drought, longer, warmer falls and more prolonged Diablo winds, and now lightning, all brought about in large part by climate change, have altered our environment and increased the likelihood and danger of wildfires. (See notes A-D) Firefighters and government officials are telling us that once a wildfire gets started, our only recourse is evacuation. (See note E) The UC Hill Campus Vegetation Management Plan acknowledges this reality by making evacuation routes safer, removing highly flammable vegetation within 100 feet along Centennial Drive, Claremont Avenue and the Jordan Fire Trail. So far, so good.

However, the need for evacuation once a wildfire takes hold underscores the importance of preventing wildfires from starting and becoming unmanageable in the first place. Based on well-known principles of fire behavior in our new reality, much more effective and stringent vegetation management is required than what is noted in the University's Plan. The Plan is simply inadequate. More work will require more funding, indeed much more than the Cal Fire grant provides. Thus, the Plan should be a plan for what is needed to obtain a relatively fire safe situation, whether or not it is fully funded by the Cal Fire grant. The Plan needs to establish clear priorities to ensure the most pressing needs are addressed first, whether or not the full Plan is funded initially. The Plan should state what work would be done under the Cal Fire grant and what would await availability of additional resources. Other resources are essential and it is important for the University to identify them. If a fire spreads from the Hill Campus to the homes, businesses, and University facilities downwind, the damage and the liability to the University will be in the billions of dollars. The Plan must address in full the future vegetation management needs of the Hill Campus. It cannot simply be a shopping list for using the funds provided by the Cal Fire grant. O8-1

Wind Speed and Canopy Fire

Today California wildfire windspeeds have been measured in the range of 40 to 55 miles per hour. (See note F) Yet, referring to the Hill Campus, the report states on page 44, the rate of fire spread "is expected to be slow to moderate, or 1 to 20 chains/hr" or 1.4 to 28 mph. On page 49 the Plan refers to very strong winds at 40 mph. Based on available scientific evidence, the Plan underestimates the potential windspeeds and associated speeds of fire spread based on previous fires both here and elsewhere. One might hope that wind speeds will not exceed 28 or 40 mph, but, given the evidence of wildfire wind speeds already measured, the Plan must O8-2 address not only most probable scenarios, but also reasonably foreseeable worst-case scenarios, rather than limiting itself to a best-case situation.

The Plan states on page 46 that "While only 21.61 acres in the Plan Area are expected to experience canopy-to-canopy fire spread, more than 300 acres can be expected to torch, consuming the tree canopy and producing and distributing embers, . . . Canopy fire is rare and occurs in small patches sprinkled throughout the Hill Campus."

Wind speeds measured during recent wildfires must be taken seriously. Even looking back to evidence of the spread of burning embers in the Tunnel Fire 29 years ago, the danger is much greater than the Plan suggests. "Small patches" may not be the case in the new reality. We all recall that in 1991 burning embers blew across Highway 24 and destroyed homes on the south side of the freeway. Those winds were measured at 60 mph. (See note G) With current measurements of wildfire winds running even higher than that, both crown fires and firebrand and ember spread are likely to be much greater than what the Plan considers. The Plan notes the potential for damage to campus facilities from canopy fires but given the evidence of these greater velocities, it is especially important that the Plan consider and discuss what may occur if a fire spreads beyond the campus.

O8-2 cont.

Lightning Must be Considered

In addition to wind, it is now clear that lightning is another cause of wildfires that the Plan must address. The *San Francisco Chronicle* reported on August 18, 2020, "Residents in multiple Bay Area counties fled their homes under mandatory evacuation orders Monday as inland temperatures soared above 100 degrees and firefighters battled a series of rapidly spreading wildfires sparked by lightning storms--with a threat of more on the way." (See note H) It has been known for centuries that lightning will hit the highest available points. Here that means lightning strikes the canopies, not the ground underneath the trees, creating another reason for canopies to be removed on a far wider scale than proposed in the Plan, beginning with canopies on ridgelines but also wherever canopies are the highest points in the immediate area. The August 2020 lightning storm that caused so many fires in Northern California was the result of a tropical storm in the Pacific Ocean west of Baja California moving northward and causing its warm, moist air to reach land and initiate powerful lightning and thunder storms. Meteorologists tell us that such events will be increasingly likely as climate change continues to warm the Pacific Ocean. (Attachment I) Future ignition events similar to those of August 2020 must now be considered reasonably foreseeable and must be addressed by the Plan. O8-3

In the interest of safety and prudence, the Plan should do more to prevent canopy fires from occurring. Removing eucalyptus and pine trees from areas near ridgelines is a top priority. However, in the new reality that includes higher wind speeds and lightning-induced ignitions, all highly flammable eucalyptus and pine trees should be removed throughout the Hill Campus. The Plan correctly lays out the methodology for removing these trees known to spread wildfire from their burning canopies but this methodology needs to be applied far more widely. As stated previously, the Plan should be based on what is necessary and not simply on what the current source of funding allows. We join with Forestry Professor Emeritus Joe McBride, who has examined the Hill Campus wildfire prevention matter in detail and thinks all eucalyptus and pine trees should be removed. Yet the UC EIR dismisses the McBride alternative. Science should determine what is in the Plan. Budgeting should be a separate matter. O8-3 cont.

Thinning, Shaded Fuel Breaks and Canopies

The Plan goes into detail about how thinning and removing the understory can help prevent wildfires. We do not disagree. However, this method does not create true fuel breaks that will be effective in stopping a wildfire from spreading during periods of high winds. The term "shaded fuel break" is a misnomer and is misleading to anyone who takes the term at face value. In the new reality multiple sources of wildfire must be considered. Certainly, one source that is evident from prior fires in the East Bay Hills is fires which start on the ground from multiple sources, natural and human, and go up fuel ladders and light canopies. Removing the understory does prevent this kind of ground fires from climbing into canopies and spreading.

However, removing fuel ladders fails to address fires that start elsewhere. These include both lightning-initiated direct canopy fires and the spread of fires to canopies through wind driven embers and firebrands. Removal of tall, highly flammable canopies will not only reduce the risk of lightning strike-initiated fires, it also will reduce the likelihood of crown fire transmission through wind-born embers or firebrands. This is another reason to remove pine and eucalyptus from the entire hill campus. O8-4

As we know from recent experience, winds and especially the strong, hot, dry Diablo Winds that affect the Hill Campus, are a major fire risk. The 1991 Tunnel fire started locally on the ground but it was spread by the wind driven embers from eucalyptus tree canopies. The danger of canopy fires has increased as drought and disease have attacked the eucalyptus and pine forests in the Hill Campus, dried them out and made the fire danger there far greater than the Plan suggests. Those risks will only grow as climate change causes even hotter and drier summers and falls in the East Bay Hills. Eliminating both ladder fuel and canopies is necessary in this new reality.

On page 15, the Plan discusses the previous, successful removal of Eucalyptus sprouts and canopies in Claremont Canyon, but it understates the extent of the effort that was involved. Rather than just in 2005-06, the effort began in 2001 and continued through 2007 and required on-going maintenance thereafter.

Maintenance

Continued long-term maintenance of treated areas is essential if the initial work conducted is to have a lasting impact. On pages 81 and 84-85, the Plan suggests that maintenance will occur over a 10-year period. Based on the Conservancy's work in Claremont Canyon, 10 years is not sufficient. Today, 15 years following the removal of eucalyptus trees from Claremont Canyon and treating the stumps, Conservancy volunteers continue to find new eucalyptus sprouts. The O8-5

University has been responsive when we have pointed out the situation to staff and its contractor has removed them and retreated stumps. It should be noted that these new sprouts will grow rapidly, from six to 10 feet per year so prompt removal and treatment with Garlon is necessary and should be continued for at least 15 years, and not 10 years. O8-5 cont.

Studies have shown that sprouting of new eucalyptus plants after removal of adult trees comes from two places. One is from the stumps of removed trees that were not completely killed, Unless the root system is killed with herbicide treatment, new sprouts can continue to grow. In most cases, however, new sprouts come from completely new plants. These new plants in turn come either from seeds left behind by the removed trees or from seeds spread by winds from existing eucalyptus plantations elsewhere that were not part of earlier eradication efforts. In Claremont Canyon, the initial removal of eucalyptus stems was completed in 2007, 13 years ago. Therefore, there is reason to believe that new stems are coming from wind-blown seeds. O8-6 These likely originated from existing eucalyptus groves on the hillside above the canyon. (See Note J) In either case site maintenance requires eliminating sources of new trees. Unless the Plan includes provisions for removing all eucalyptus groves and continued monitoring to eliminate newly-sprouted plants, additional monitoring beyond that anticipated in the Plan will be necessary into the foreseeable future. Once new eucalyptus sprout takes hold, young trees will grow six-to 12 feet or more per year if not removed. (See note K)

Page 22 of the Plan stipulates that trail maintenance shall not be performed in Claremont Canyon. There is no explanation of the justification underlying this statement. In particular, the Plan does not identify a relationship between trail maintenance and vegetation management for wildfire prevention. University personnel were involved in building trails and the Conservancy provided volunteers and tools for the building and the maintenance of trails in Claremont Canyon. Today these trails are used to access the Canyon to remove fire-prone and invasive species, and by hikers, runners, dog walkers, those simply looking for a place to go beyond their homes during the pandemic, and occasionally by UC Berkeley forestry students. O8-7 Trails require occasional maintenance to prevent them from becoming a liability. If the prohibition of maintenance is only to exclude this from funding under the Cal Fire grant, then the Plan should so state. If the intention is to do no further maintenance period, then the University must be prepared to explain itself to the many users of the trails and to state that it accepts liability if an accident happens.

Additional Fire Station, Equipment and Cameras

Page seven of the Plan states that it considers only vegetation management and not other tools. However, the Conservancy is aware of three issues that UC should include in the Plan, whether they are funded by the Cal Fire grant or not. One is the need for and opportunity to have another fire station in the area and available to extinguish vegetation fires in the Hill Campus. UC should persuade Cal Fire to install a fire station on a plot of available land on Fish Ranch Road on the east side of the hills just above the intersection with Highway 24. Related to this is the need for additional fire fighting equipment. In his alternative plan, Professor McBride O8-8 notes the advisability of purchasing off-the-road fire trucks. We urge the University to work together with Cal Fire and purchase this equipment.

The third item is the installation of a camera trained on the Hill Campus that is able to spot plumes of smoke at the very beginnings of a fire and relay that information to the proper authorities. Such cameras exist today and have proven most helpful in the early suppression of fires, before they become unmanageable. Funds to install and more importantly monitor such a camera would prove to be a worthwhile investment. O8-8 cont.

Notes

The following notes and links are hereby incorporated in this Comment from the Claremont Canyon Conservancy.

A) Center for Climate and Energy Solutions. https://www.c2es.org/content/wildfires-and-climate-change/

B) Fourth National Climate Assessment, US Global Change Research Program, https://science2017.globalchange.gov/chapter/6/

C) Fourth National Climate Assessment, US Global Change Research Program, https://science2017.globalchange.gov/chapter/7/

D) Fourth National Climate Assessment, US Global Change Research Program, https://science2017.globalchange.gov/chapter/8/

E) Give your household the best chance **of** surviving a wildfire by being ready to go and **evacuating** early. Cal Fire, https://www.readyforwildfire.org/prepare-for-wildfire/go-evacuation-guide/ O8-9

F) https://www.sacbee.com/news/california/fires/article246001395.html. https://www.athenium.com/news/wind-data-california-woolsey-camp-wildfires/

G) Page 3-75 of the 2014 City of Berkeley Local Hazard Mitigation Plan. https://www.cityofberkeley.info/uploadedFiles/Fire/Level_3_-_General/2014%20LHMP.pdf

H) "How a surge of lightning strikes ignited more than 500 California wildfires", Matt Brannon, Redding Record Searchlight, August 21 updated August 23, 2020. https://www.redding.com/story/news/local/2020/08/21/what-caused-california-wildfires-2020-lightning-strikes-cal-fire-map-ca/3413807001/

I) https://www.ebparks.org/climatesmart.htm

J)
https://static1.squarespace.com/static/56e612b159827e4b847675c9/t/5f790d423eaedf59be724140/1601768772542/Going+nowhere+fast%2C+Trevor+H.+Booth.pdf O8-9 cont.

K) http://www.angelfire.com/bc/eucalyptus/eucgrowth.html

Letter O9

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October 5, 2020 Via E-Mail

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Re: Comments on the Draft Environmental Impact Report for the UC Berkeley Hill Campus Wildland Vegetative Fuel Management Plan (State Clearinghouse No. 2019110389)

Dear Mr. Breines,

The following comments are submitted on behalf of Hills Conservation Network ("HCN") regarding the Draft Environmental Impact Report ("DEIR") for the UC Berkeley Hill Campus Wildland Vegetative Fuel Management Plan ("WVFMP" or "Project").

INTRODUCTION

For the past 10 years, HCN has been working with local East Bay agencies and institutions to reduce the risk of wildfire in the East Bay Hills. While there is a shared desire to make the area safer from wildfire, there have been significant changes in thinking as to how best to accomplish this goal as the overall fire regime in California has become more dangerous.

Unlike other parties involved in these discussions, HCN has consistently advocated for methods that are laser-focused on reducing wildfire risk. In the view of HCN, consideration of the origin of various nonnative species is not relevant to the determination of various optimal courses of action. Based on the support HCN has received from a broad cross section of the affected community, we are confident that the community wants enhanced fire safety at the lowest cost and with the least damage to the environment. O9-1

HCN favors an approach that identifies the various risks and assigns these risks a cost/benefit ranking to establish priorities. The community sees great value in the environment of the East Bay Hills and wants to protect this treasure while ensuring that fire risks are effectively mitigated. HCN is dedicated to this goal.

LEGAL BACKGROUND

CEQA requires that an agency analyze the potential environmental impacts of its proposed actions in an environmental impact report ("EIR") (except in certain limited circumstances). *See, e.g.* Pub. Res. Code § 21100. The EIR is the very heart of CEQA. *Dunn-Edwards v. BAAQMD* (1992) 9 Cal.App.4th 644, 652. "The 'foremost principle' in interpreting CEQA is that the Legislature intended the act to be read so as to afford the fullest possible protection to the environment within the reasonable scope of the statutory language." *Communities for a Better Environment v. Calif. Resources Agency* (2002) 103 Cal. App. 4th 98, 109.

CEQA has two primary purposes. First, CEQA is designed to inform decision makers and the public about the potential, significant environmental effects of a project. 14 Cal. Code Regs. ("CEQA Guidelines") § 15002(a)(1). "Its purpose is to inform the public and its responsible officials of the environmental consequences of their decisions before they are made. Thus, the EIR 'protects not only the environment but also informed self-government.'" *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal.3d 553, 564. The EIR has been described as "an environmental 'alarm bell' whose purpose it is to alert the public and its responsible officials to environmental changes before they have reached ecological points of no return." *Berkeley Keep Jets Over the Bay v. Bd. of Port Comm'rs*. (2001) 91 Cal. App. 4th 1344, 1354 ("*Berkeley Jets*"); *County of Inyo v. Yorty* (1973) 32 Cal.App.3d 795, 810.

Second, CEQA requires public agencies to avoid or reduce environmental damage when "feasible" by requiring "environmentally superior" alternatives and all feasible mitigation measures. CEQA Guidelines § 15002(a)(2) and (3); *see also*, *Berkeley Jets*, 91 Cal.App.4th at pp. 1344, 1354; *Citizens of Goleta Valley*, *supra*, 52 Cal.3d at 564. The EIR serves to provide agencies and the public with information about the environmental impacts of a proposed project and to "identify ways that environmental damage can be avoided or significantly reduced." CEQA Guidelines §15002(a)(2). If the project will have a significant effect on the environment, the agency may approve the project only if it finds that it has "eliminated or substantially lessened all significant effects on the environment where feasible" and that any unavoidable significant effects on the environment are "acceptable due to overriding concerns." Pub. Res. Code § 21081; 14 Cal.Code Regs. § 15092(b)(2)(A) & (B). The lead agency may deem a particular impact to be insignificant only if it produces rigorous analysis and concrete substantial evidence justifying the finding. *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 732.

O9-2

While the courts review an EIR using an "abuse of discretion" standard, "the reviewing court is not to 'uncritically rely on every study or analysis presented by a project proponent in support of its position. A 'clearly inadequate or unsupported study is entitled to no judicial deference.'" *Berkeley Jets, supra*, 91 Cal. App. 4th at p. 1355 (emphasis added) (quoting *Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal. 3d 376, 391 409, fn. 12). As the court stated in *Berkeley Jets*:

> A prejudicial abuse of discretion occurs "if the failure to include relevant information precludes informed decisionmaking and informed public participation, thereby thwarting the statutory goals of the EIR process." (*San Joaquin Raptor/Wildlife Rescue Center v. County of Stanislaus* (1994) 27 Cal.App.4th 713, 722; *Galante Vineyards v. Monterey Peninsula Water Management Dist*. (1997) 60 Cal. App. 4th 1109, 1117; *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal. App. 4th 931, 946.)

More recently, the California Supreme Court has emphasized that:

> When reviewing whether a discussion is sufficient to satisfy CEQA, a court must be satisfied that the EIR (1) includes sufficient detail to enable those who did not participate in its preparation to understand and to consider meaningfully the issues the proposed project raises [citation omitted], and (2) makes a reasonable effort to substantively connect a project's air quality impacts to likely health consequences.

Sierra Club v. Cty. of Fresno (2018) 6 Cal.5th 502, 510 (2018), citing *Laurel Heights Improvement Assn. v. Regents of University of California* (1988) 47 Cal.3d 376, 405. "Whether or not the alleged inadequacy is the complete omission of a required discussion or a patently inadequate one-paragraph discussion devoid of analysis, the reviewing court must decide whether the EIR serves its purpose as an informational document." *Sierra Club v. Cty. of Fresno, supra*, 6 Cal.5th at 516. Although an agency has discretion to decide the manner of discussing potentially significant effects in an EIR, "a reviewing court must determine whether the discussion of a potentially significant effect is sufficient or insufficient, i.e., whether the EIR comports with its intended function of including 'detail sufficient to enable those who did not participate in its preparation to understand and to consider meaningfully the issues raised by the proposed project.'" 6 Cal.5th at 516, citing *Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1197. "The determination whether a discussion is sufficient is not solely a matter of discerning whether there is substantial evidence to support the agency's factual conclusions."(6 Cal.5th at 516. Whether a discussion of a potential impact is sufficient "presents a mixed question of law and fact. As such, it is generally subject to independent review. However, underlying factual determinations—including, for example, an agency's decision as to which methodologies to employ for analyzing an environmental effect—may warrant deference." *Sierra Club v. Cty. of Fresno*, 6 Cal.5th at 516. As the Court emphasized: O9-2 cont.

> [W]hether a description of an environmental impact is insufficient because it lacks analysis or omits the magnitude of the impact is not a substantial evidence question. A conclusory discussion of an environmental impact that an EIR deems significant can be determined by a court to be inadequate as an informational document without reference to substantial evidence.

Sierra Club v. Cty. of Fresno, 6 Cal.5th at 514.

DISCUSSION

I. The DEIR's Project Description is Inadequate and Prevents the Public and University From Evaluating the Environmental Impacts of the FHR Projects.

A major flaw in the DEIR is its failure to adequately describe what mix of treatment and extent of tree removal, *i.e.* eradication or selective thinning, will occur and where within the three Fire Hazard Reduction projects for which the DEIR is addressing on a project-level. As written, the DEIR does not specify what the FHR treatment plans look like. Unfortunately, as a result, the DEIR fails to provide any meaningful impact analysis or ability to compare the proposed FHR Projects to any alternatives because no one can tell what specific actions the FHR Projects include.

"An accurate, stable and finite project description is the *sine qua non* of an informative and legally adequate EIR." *County of Inyo v. City of Los Angeles* (1977) 71 Cal.App.3d 185, 192; *Berkeley Jets*, 91 Cal.App.4th at 1354; *Sacramento Old City Assn. v. City Council* (1991) 229 Cal.App.3d 1011, 1023; *Stanislaus Natural Heritage Project v. County of Stanislaus* (1996) 48 Cal.App.4th 182, 201. "[A] curtailed or distorted project description," on the other hand, "may stultify the objectives of the reporting process. Only through an accurate view of the project may affected outsiders and public decision-makers balance the proposal's benefit against its environmental costs, consider mitigation measures, assess the advantage of terminating the proposal (*i.e.*, the "no project" alternative) and weigh other alternatives in the balance." *Id. See also*, CEQA Guidelines § 15124. O9-3

Applying these standards, the University must go back to the drawing Board, provide the details of all tree removal and other activities it is planning on conducting for the FHR projects, analyze those projects in a revised EIR, and circulate that new EIR for public review and comments.

A. The DEIR Fails to Disclose the Quantity or Extent of Trees That Will be Removed in the FHR Projects.

As described in the WVFMP and the DEIR, the University can cut relatively few trees through selective thinning or may remove almost all of the trees from the FHR Project areas. Whether to adhere to selective thinning or, as the University has previously proposed, "eradication" of all eucalyptus and pine trees in the FHRs has been the focal point of community disputes over the University's vegetation management for at least the last decade (perhaps longer). Rather than disclose their plan for the FHRs and squarely address the potential impacts of selective thinning versus eradication, the University hides the details. Within the FHRs, the University provides an entirely subjective list of criteria which it will apply after the FHRs and WVFMP are approved to inform the public the extent of tree removal it actually has in mind. For example, the WVFMP identifies the following treatment activities within the three FHRs: O9-4

The Fire Hazard Reduction Treatment involves the following activities:

• Evaluate trees and shrubs for both vertical and horizontal spacing and their corresponding potential to torch and produce embers; and

• Remove tall, unhealthy or structurally unsound trees, predominantly eucalyptus that are likely to torch and distribute embers; and remove short trees under tall trees.

WVFMP, p. 60. The WVFMP then lists the following criteria for tree removal in the FHRs:

> Criteria for tree removal includes flammability/fire hazard, consideration of tree health, structure, height, potential for failure/falling, and competition with other trees (including for water, space, and light), and high fuel volume production of small diameter fuels. Criteria for retention of trees includes fuel characteristics (flammability, fuel volume amount of dead material), consideration of ability to slow spreading of invasive species and surface fuels, protection of understory, encouragement of nesting and improvement of flight patterns of raptors, prevention of erosion, and cost of removal.

WVFMP, p. 60. The WVFMP then acknowledges that the type of tree to be removed would usually be eucalyptus and pine trees but again hedges on stating clearly the scope of tree removal expected in the FHRs. *Id*., p. 63 (of the 98.4 acres to be treated in the FHRs "[m]ost of the treatment area comprises dense pine and eucalyptus tree cover that will have the trees cut, stumps treated, and protection given to interspersed native oak, bay and other tree species as well as native brush vegetation"); *Id*. ("In all three areas, the treatments would focus on removing high hazard vegetation"). O9-4 cont.

The DEIR does not provide any additional clarity regarding the extent of tree removal within the FHRs, simply reiterating the vague and open-ended criteria listed in the WVFMP. *See* DEIR, p. 2-9. This broad list of subjective criteria would justify the removal of any tree within the FHRs. All trees are flammable. They all pose some degree of fire hazard. In the case of eucalyptus trees, given the dire description of potential spotting from eucalyptus painted in the WVFMP, any and all eucalyptus trees removal would be justified by the loose criteria. WVFMP, pp. 26-27. See DEIR, p. 3.12-4. Likewise, the DEIR already attempts to single out eucalyptus trees as posing a high fire hazard. DEIR, p. 3.12-4.[1] Thus, a criterion of "fire hazard" is no

[1] Nor is there evidence or any discussion in the DEIR regarding the fire risks posed by native trees as well compared to non-natives. Bays, chaparral and oak trees all burn. Indeed, according to the Hills Emergency Forum, the average flame length for a mixed hardwood forest (including oaks and Bay trees) is 17.5 feet compared to an average flame length for eucalyptus of 13.5 feet. *See* Close Report, p. 11. Average flame length for brush is 41.5. *Id*. Nor does the DEIR disclose any evidence showing that burning eucalyptus trees will result in greater spotting and firebrand production than other species such as oaks or Bay trees. Indeed, the catastrophic wildfires engulfing large areas of the north and south bays are predominantly oak woodland and shrub areas. Obviously, spotting and high flame lengths are occurring in those native habitats. Lastly,

criteria at all for the extensive groves of eucalyptus forests found in the FHRs. The presence of oily resins and potential ignition of litter build-up in the University's eucalyptus forests also makes many of the "dead materials" and "fuel volume production" criteria no criteria at all when applied to the FHRs and their extensive eucalyptus groves. *See* DEIR, p. 3.12-4.

Given the University's familiarity with the three FHR areas, it is inconceivable that the University does not know the extent of tree removal that is expected for the Project. The University had ample time during the last two years since it filed its application for funding from CalFire to survey the FHR areas and determine with precision the extent of tree removal in the FHRs it believed was necessary to achieve its fire management goals. Fire Prevention Program Grant Application Fiscal Year 2017-18 dated June 6, 2018. Indeed, during the FEMA process, the University and FEMA disclosed the number of trees proposed to be removed in that project. *See* Final EIS ("Approximately 12,000 eucalyptus, pine, and acacia trees would be cut down" in the Strawberry Canyon-PDM); 3-35 ("About 10,000 trees would be cut down" in the Claremont-PDM). Rather than disclose the level of tree removal the University intends to implement in the FHRs, the WVFMP and DEIR serve to obfuscate the extent of tree removal. As a result, the DEIR frustrates the public's ability to understand the extent of the proposed project, whether or not it would achieve the fire risk reduction goals identified by the University, and the extent of the significant impacts that may result from the Project, including impacts on fire risk, visual and aesthetic impacts, wildlife impacts, and greenhouse gas emission and sequestration impacts. O9-4 cont.

Rather than disclose the details of the tree removal projects in the FHRs, the WVFMP and DEIR are designed to obfuscate the Project and hide the extent of tree removal planned for the FHRs. The goal of this vague project description is either a naive attempt to assuage the conflicting positions of various commenters that the project is consistent with both selective thinning of eucalyptus and pine forests or their complete eradication or, more likely, an effort by the University to hide the specifics of the Project in an effort to frustrate one or the other viewpoint from understanding and critiquing the actual extent of tree removal being planned by the University in the FHRs. Either way, it is a complete rebuff to the goals, purposes and requirements of CEQA which, among other things, include requiring sufficient detail in an EIR to "insure the integrity of the process of decision by precluding stubborn problems or serious criticism from being swept under the rug." *Concerned Citizens of Costa Mesa, Inc. v. 32nd Dist. Agric. Assn.* (1986) 42 Cal. 3d 929, 935, 727 P.2d 1029, 1032 (1986), citing *People v. County of Kern* (1974) 39 Cal.App.3d 830, 841.

B. Project Description of the FHR Projects is Unstable and Inconsistent with the Information Provided in the DEIR.

The DEIR's description of the three FHRs and the proposed mechanical treatment of these areas is inconsistent with the description of these Projects that they do not include any heavy equipment on slopes greater than 30 percent. This inconsistency and the failure to identify O9-5

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the Flammap modeling of the existing conditions conducted by the University does not discern between species of trees.

the locations of particular treatment methods within the FHRs further illustrates the inadequacy of the DEIR's project description.

In regard to the FHR Projects, the project description states that the Claremont and Strawberry FHRs will be conducted using only mechanical treatment. DEIR, p. 2-23 ("Strawberry FHR Project would be implemented using mechanical equipment on approximately 24 acres in the northwesternmost part of the Plan Area"); *Id*. ("The Claremont FHR Project would be implemented using mechanical equipment on approximately 26 acres in the southeastern portion of the Plan Area"). The Frowning FHR would use mechanical treatment for most of that FHR area. One can deduce that about 12 acres of Frowning FHR would be manually treated. *See* DEIR, p. 3.6-20 (Table 3.6-7) ("37.2 acres of the Frowning FHR would include mechanical treatment as well as grading of access roads and landings in this area"); DEIR, p. 2-23 ("The Frowning FHR Project would be implemented on approximately 49 acres spanning the northern portion of the Plan Area using manual and mechanical methods").

At the same time as describing these FHRs as including mechanical treatment, the EIR also acknowledges limits or places restrictions on the use of mechanical treatment. "Mechanical vegetation treatment involves the use of heavy motorized equipment, such as feller-bunchers and masticators, specially designed to cut, tear, uproot, crush, compact, or chop target vegetation" DEIR, p. 2-10. The DEIR identifies mechanical equipment as including "feller buncher, yarder, skidder, masticator, tractor, brush cutters/mower, [and] grapple saw." DEIR, p. 2-6 (Table 2-1). "Use of feller-bunchers is limited to slopes of less than approximately 45 percent." DEIR, p. 2-10. "A grapple saw can fell and remove trees up to 100 feet from where it is mounted and would be used from existing roadways to remove vegetation from sensitive interior areas." *Id*. O9-5 cont.

"Heavy equipment on steep slopes can cause extensive soil disturbance." EIR, p. 3.6-17. As a result, "[t]rees on steep slopes would be cut down using hand-held equipment only; ***no heavy equipment would be used***." DEIR, p. 2-9 (emphasis added). Likewise, the FHR projects would incorporate environmental protection measures ("EPMs"). DEIR, p. 2-24. EPM GEO-3 Minimize Erosion provides that "[t]o minimize erosion, UC Berkeley will prohibit heavy equipment use where slopes are steeper than 30 percent." DEIR, p. 2-26. See also DEIR, p. 3.6-18 ("EPM GEO-3 prohibits use of heavy equipment on slopes steeper than 30 percent").

The DEIR's description of the Strawberry and Claremont FHR as using only mechanical treatment relying on heavy equipment is inconsistent with the DEIR's restrictions on heavy equipment use and the slope and access roads and trails to those FHRs. The description of all mechanical treatment for those two FHRs cannot be squared with the slopes that exist within those areas. Figure 3.6-2 provides a map of soil types with slope ranges for broad areas within the Hill Campus area. DEIR, p. 3.6-4. Along the northern edge of the Hill Campus, slopes range from 30 to 50% in the Gilroy clay loam area. The areas marked as Maymen loam and Maymen-Los Gatos complex indicate that slopes in that are from "30-75% slopes." The Claremont FHR is located entirely within these Maymen zones. DEIR, p. 3.6-4. See also Table 3.6-3 (100% of Claremont FHR area has slopes of from 30 to 75%). The Strawberry FHRs is mostly within that same zone but also extends northward into the Gilroy clay loam zone. DEIR, p. 3.6-4. *See also* Table 3.6-3 (96.5% of Strawberry FHR have slopes greater than or equal to 30%). According to

Figure 3.6-2, none of these areas have slopes less than 30 percent. The Project description stating that no heavy equipment will be used on slopes greater than 30 percent is inconsistent with the description's claim that all of the treatment in the Claremont and Strawberry FHRs will be mechanical. Although perhaps a few locations will be precisely 30 percent slope, from the information provided in the DEIR, it is clear that many, perhaps the vast majority of slopes within these FHRs exceed 30 percent. It simply cannot be true that all of the treatments can or will be mechanical for these entire areas. O9-5 cont.

The same inconsistency also plagues the description of the Frowning FHR. The description of the Frowning FHR generally states that about ¾ of that area will be treated mechanically but does not describe where in the Frowning FHR those areas are located. The Frowning FHRs is mostly within the Maymen loam and Maymen-Los Gatos complex soil zones with slopes from 30-75% slopes. Portions of the Frowning FHR extend northward into the Gilroy clay loan zone. DEIR, p. 3.6-4. *See also* Table 3.6-3 (84.4 % of Frowning FHR area has slopes of 30 to 50%). Because the Frowning FHR also contains extensive areas with slopes greater than 30 percent, the DEIR inconsistently has mechanical treatment in this area in areas where it is not available or allowed. O9-6

Similarly, grapple saws being operated from adjacent roads, trails and landings would only be able to reach modest portions of the Strawberry, Claremont and Frowning FHRs. Figure 2-2 shows the general locations of existing landings in relation to the three FHR Projects. DEIR, p. 2-3. That figure also shows the locations of existing roads and access trails. *Id*. Circular symbols for the landings, although not indicative of the actual size of the landing areas, are also identified. *Id*. Fire trails and roads also are depicted on Figure 3.2-1. DEIR, p. 3.2-3. See also p. 3.11-3 (Figure 3.11-1). Based on the provided maps, it is clear that areas to be treated within the FHRs extend well beyond 100 feet from roads, trails or landings where a grapple saw could be mounted. O9-7

As a result, the DEIR's description of the FHR Projects is inconsistent and unstable because, based on the information provided, it includes mechanical treatment in areas where it prohibits mechanical treatment. Likewise, there is no explanation how equipment operating from roads, trails or landings could mechanically treat the FHRs. To comply with CEQA, the DEIR's project descriptions of the FHRs must specify where in each of the FHRs mechanical treatment would occur, where manual treatment would occur, the types of mechanical treatment equipment that would be used in each area of the FHRs, and the location of any skid trails. The description also should map the actual slopes of the areas within the FHRs. O9-8

Relatedly, the DEIR vaguely asserts that projects within the WVFMP will include an Access Plan." DEIR, p. 2-25 (EPM BIO-6). The Access Plan would be designed to minimize ground disturbance. "UC Berkeley will use existing roads, trails, and former logging paths and minimize ground disturbance from equipment and vehicles (e.g., wheels, tracks, skidding to landings), to the extent feasible." *Id*. "UC Berkeley will develop an access/implementation plan that maps and names all fire roads and/or trails that will be used to reach treatment areas and that details the starting location(s) and direction of progression of treatment in coordination with a qualified biologist approved by USFWS and CDFW." *Id*. This provision is prudent. However, O9-9 for the Identified Treatment Projects being addressed in this EIR, including in particular each of the FHRs, these details must be disclosed in the DEIR in order to provide a sufficient description of these projects from which to evaluate impacts and alternatives. O9-9 cont.

II. The DEIR Fails to Adequately Disclose and Address the Significant Visual Impacts of the FHRs and the WVFMP.

The DEIR's discussion of visual impacts to recreational users of trails and motorists using roads adjacent to or through the FHR areas fails to disclose the scope of tree removal and deforestation that is planned for the Project. The University continues its effort to mask the scope of the proposed FHR projects with a vague discussion of visual impacts from the unclear level of tree removal intended for the FHR areas. Because of the deficient project description, the scope of tree removal in the FHRs could be limited to selective thinning or extend up to almost complete removal of all trees in some areas. The vagueness of the project descriptions for the FHR Projects is now echoed in an equally vague and meaningless discussion of visual impacts. O9-10

A reader cannot discern the scope of tree removal in the Strawberry FHR. As a result, the general discussion of this FHR Project's visual impacts fail to convey the actual visual impacts of the Project and whether there is any potential to mitigate those impacts. The DEIR states "[v]iews of surrounding wooded areas along Centennial Drive and portions of Grizzly Peak Boulevard, and Jordan Fire Trail would be disrupted by treatment activities." DEIR, p. 3.2-20. If the treatment activities amount to clearcutting all of the trees in the vicinity of roads and trails in this FHR, that would of course be a significant and presumably unmitigable impact on recreational and other users with "moderate to high sensitivity to disruption to visual resources…." *Id*. A selective thinning regimen would have much less, if any, visual impacts. Because the DEIR does not provide any detail on what level of tree removal will be in this FHR, the analysis of visual impacts is unreasonable on its face and not supported by any substantial evidence. O9-11

The DEIR does not include any photographs of the current views of surrounding woods and areas from any trails or roads in the Strawberry FHR. Thus, even if the DEIR described the Strawberry FHR Project with sufficient detail, there would be no baseline to gauge the visual impacts of tree removal.

The discussion of visual impacts from the proposed Claremont FHR is equally devoid of detail. The DEIR vaguely states that "views of surrounding wooded areas on the slopes visible from Claremont Avenue and Grizzly Peak Boulevard would be affected by treatment activities." DEIR, p. 3.2-20. Recreationists using this FHR area are recognized as being highly sensitive to visual disturbances. *Id*. Assuming the University's project is to cut down all of the eucalyptus and pine trees in this FHR, the resulting impacts would be highly significant to recreationists and motorists using this area. No mention of that scenario or any detail of the scope of tree removal is provided in the discussion. The two photos of existing conditions at specific locations adjacent to this FHR only emphasize the lack of any meaningful discussion of visual impacts. Clearcutting all of the eucalyptus trees depicted in Photo P-7 (DEIR, p. 3.2-13, Figure 3.2-8) and replacing them with a field of stumps, slash, abandoned logs, and wood chips would have a O9-12 dramatic impact on the view of hikers ascending or descending the fire access road running through this area or motorists driving by the location of P-7. The same is true for the trees depicted on the left side of Claremont Avenue at Mile Post 29, depicted in Photo P-5. DEIR, p. 3.2-10, Figure 3.2-6. O9-12 cont.

The discussion of visual impacts from the Frowning FHR suffers from the same defects. The generic statement that, within this FHR, the "[s]urrounding vegetated areas on the slopes visible from Upper Jordan Fire Trail and connecting trails would be affected by treatment activities," does nothing to convey the actual visual impacts that may result from the Project, especially if all of the eucalyptus and pine trees are removed. Because the reader has no idea what level of tree removal will occur, the vague discussion of visual impacts in this FHR is unreasonable and not supported by any substantial evidence. Rather than a shaded fire road, the highly sensitive hikers on Upper Jordan Fire Trail would be walking on an unshaded trail and viewing a perhaps completely denuded landscape. No reader can tell from this EIR. The visual impact discussion of the Frowning FHR is unreasonable and unsupported by a clear project description or any evidence. O9-13

The DEIR's conclusion regarding short-term visual impacts also is devoid of any reasonable detail or logical basis. Acknowledging the Identified Treatment Projects "could result in short-term degradation of public views," the conclusion claims that "because treatment types and activities are visually similar to other vegetation treatments and landscaping activities already occurring in the Plan Area, and EPMs would be integrated into treatment design to avoid and minimize aesthetic impacts and reduce viewer exposure, short-term degradation would not be substantial." DEIR, p. 3.2-22. This conclusion is not defensible given the unclear scope of tree removal proposed for the FHRs and the likelihood that the University is aiming to take advantage of the DEIR's and WVFMB's vagueness to proceed with removing essentially all of the trees from these areas. Of course, that level of tree removal is not happening currently. The University has no reasonable basis or evidence for its conclusion that "[i]mpacts from the proposed Identified Treatment Projects to scenic vistas, to visual character or quality of public views, would be less than significant." O9-14

The same is true for long-term visual impacts. The DEIR's analysis of this impact (Impact AES-2) for the three FHRs states, in its entirety: O9-15

> Of all the treatment types implemented for the Identified Treatment Projects, the FHR projects would retain most visually dominant vegetation. Along the Upper Jordan Fire Trail, scenic and long-range views would be improved by the thinning of dense vegetation. However, less vegetation would be present where these treatments occur, and eucalyptus trees exist in all three FHR project areas that would likely be removed. Because vegetation removal would be long-term and visible to recreationists with high sensitivity to visual change, the visual character and quality of public views would be degraded.

DEIR, p. 3.2-25. This herky-jerky discussion perhaps best exemplifies the absence of any clear description of what level of tree removal is intended by the University for the three FHRs. On the one hand, the reader is told that "FHR projects would retain most visually dominant vegetation." *Id*. At the same time, "less vegetation would be present where these treatments occur, and eucalyptus trees exist in all three FHR project areas that would likely be removed." *Id*. Given that each of the FHRs is dominated by eucalyptus trees, it is easy to imagine that the FHR treatments would remove almost all of the trees in the FHRs. However, the University fails to identify the scope of tree removal. Accordingly, it is impossible for the reader to understand the visual impacts from the FHR Projects. O9-15 cont.

The University does conclude that the long-term impacts of removing trees in the Identified Treatment Projects would be significant prior to mitigation and that this impact is significant and unavoidable. DEIR, p. 3.2-26. However, simply concluding an impact is significant and unavoidable does not relieve the University of accurately detailing the scope of the impact. The EIR must not only identify significant impacts, but must "describe the nature and magnitude of the adverse effect." *Cleveland Nat'l Forest Found. v. San Diego Assn. of Governments* (2017) 3 Cal.5th 497, 514. "*Before* one brings about a potentially significant and irreversible change to the environment, an EIR must be prepared that sufficiently explores the significant environmental effects created by the project." *Berkeley Keep Jets*, 91 Cal.App.4th at 1371. "The EIR's approach of simply labeling the effect 'significant' without accompanying analysis of the project's impact … is inadequate to meet the environmental assessment requirements of CEQA." *Id*.

In addition, the University fails to apply all available mitigations to this acknowledged, though unexplained, visual impact. The University states it "will implement vegetation feathering techniques to reduce the visibility of the Identified Treatment Projects, but substantial degradation of a scenic vista or visual character or quality of public views would still occur despite mitigation." DEIR, p. 3.2-26. However, as is discussed below, an available feasible alternative and mitigation would be to limit treatments in the FHRs, or specified portions of those areas, to selective thinning and ground fuel controls. This would prevent many, perhaps all, of the long-term visual impacts of removing trees in the FHRs. O9-16

A lead agency may not conclude that an impact is significant and unavoidable without requiring the implementation of all feasible mitigation measures to reduce the impacts of a project to less than significant levels. CEQA Guidelines §§ 15126.4, 15091. If the project will have a significant effect on the environment, the agency may approve the project only if it finds that it has "eliminated or substantially lessened all significant effects on the environment where feasible" and that any unavoidable significant effects on the environment are "acceptable due to overriding concerns." Pub.Res.Code § 21081; 14 Cal.Code Regs. § 15092(b)(2)(A) & (B). Because selective thinning is a feasible treatment method for the FHR areas and would achieve all of the goals and objectives of the Project, the University must incorporate that method into the FHR projects in order to address this otherwise unavoidable impact.

III. The DEIR Fails to Address Likely Exacerbation of Fire Risks Resulting From Removing Large Swaths of Trees.

The DEIR fails to address the major scientific debate surrounding the University's past and current vegetation management planning. The U.S. Forest Service as well as U.S. EPA and fire experts David Maloney and Kelly Close have all referenced existing scientific studies and provided their expert opinions pointing out the significant fire risks posed by removing all trees in fire prone areas, even eucalyptus trees. There is a consensus of scientific opinion that when all trees are removed over a large area, risk of fire ignition and spread increase. This is because removing all canopy cover will eliminate shade, increase ground temperatures, remove fog drip, reduce moisture content at the ground level, increase wind speeds through the area and increase subsequent risk of fire ignition from the proliferation of weeds and grasses. Instead of large swaths of tree removal, these experts note that the most efficient and effective means of reducing wild fire risks in the East Bay Hills is selective thinning coupled with the removal of ladder fuels and lower tree limbs.

As noted above, no one can tell from the DEIR what level of tree removal the University intends for the three FHR Projects. This alone precludes any meaningful analysis in the DEIR of fire risks from the unknown treatment design. In order to evaluate the risk of fire posed by the removal of trees, the University must identify the extent of tree removal it is proposing. If the University chooses to remove all eucalyptus and pine trees from the FHRs – which are essentially all of the trees in those areas with perhaps a spattering of small oaks and bay trees left – there is ample scientific evidence indicating that such a vegetation management scheme will actually increase ignition and fire risks. This is especially true when compared to a selective thinning alternative. O9-17

The significant fire risk of large-scale tree removal in the East Bay Hills has been pointed out to the University many times over the past number of years. In particular, the U.S. Forest Service, in comments the agency submitted on the last iteration of a vegetation management plan submitted by UC Berkeley to the Federal Emergency Management Agency ("FEMA"), belied the effectiveness to reduce fire risks of eradicating acres of large and small trees alike and leaving behind, in effect, clear-cut areas:

> From a fire behavior standpoint commercial thinning from below that would target smaller diameter trees leaving the largest dominate trees on the landscape, followed by surface and ladder fuel treatments ***provides the highest level of reduction in potential fire behavior.*** These treatments and combinations of these treatments would break up the horizontal and vertical continuity from the surface fuels to the canopy fuels, by increasing canopy base height, and reducing canopy bulk density thus reducing the likelihood of crown fire ignition.

US Forest Service, Adaptive Management Services Enterprise Team Comments, p. 2 (Sept. 27, 2013) (emphasis added) (attached as Exhibit A). The Forest Service emphasized that, in areas dominated by eucalyptus, the amount of fine fuel available on the forest floor "was the most significant fuel variable affecting the behavior of fires in eucalyptus forests." *Id*., pp. 2-3. The

Forest Service warned that removing eucalyptus and other trees would promote the growth of brushland species, ***increasing*** live surface fuel loading in those areas. *Id*., pp. 1-2. The Forest Service stated:

> Removal of the eucalyptus overstory would reduce the amount of shading on surface fuels, increase the wind speeds to the forest floor, reduce the relative humidity at the forest floor, increase the fuel temperature, and reduce fuel moisture. These factors may increase the probability of ignition over current conditions.

Id., pp. 2-3.

Likewise, FEMA also has emphasized the scientific support of the effectiveness of thinning eucalyptus forests rather than clearcutting them in order to reduce fire risks:

> Numerous scientific studies and the fire modeling supported that thinning reduces fire risk and that the eradication approach, or clearing of overstory trees does not, and can in fact, increase different fire risks. ***FEMA, despite our best efforts, could not find a rational basis to discount the studies and consequently determined that we could not justify the eradication or overstory clearcutting approach*** …. Selective thinning is also preferred because it has less potential for serious negative environmental impacts.

E-mail from Antoinette DiVittorio, HMA EHP Coordinator, FEMA (Oct. 30, 2013) (emphasis added) (attached as Exhibit B).[2] O9-17 cont.

Fire Chief (ret.) David Maloney also has reviewed vegetation management options in the East Bay Hills and has warned the University of the fire risks posed by canopy removal proposals. Dec'l of David Maloney (Sept. 16, 2016) (attached as Exhibit C). Chief Maloney is the former Chief of Fire Prevention for the U.S. Army at the Oakland Army Base and a member of the 1991-1992 Emergency Preparedness and Community Restoration Task Force which investigated the 1991 Oakland Hills Fire and made recommendations to prevent a recurrence of a major fire in the East Bay hills. Chief Maloney has provided his expert opinion regarding the effectiveness of controlling fires in eucalyptus forests, such as those in the East Bay Hills, by leaving trees in place and focusing management methods on removing ladder fuels, removing dry materials from the forest floor, and removing lower limbs from trees. Maloney Dec., ¶¶ 26-27. He also points out the serious fire risks that will result from UC completely removing tree canopies that currently exist in large portions of the Hills campus. *Id*, ¶¶ 5-25.

Adding to this consensus of fire experts, Chief Kelly Close also has voiced serious scientific concerns about the increased fire risk posed by canopy removal in eucalyptus forests

[2] EPA also raised concerns that an eradication approach, questioning the assumption that areas where trees were removed would realize the benefits of "natural regeneration." USEPA Detailed Comments, p. 3 (June 17, 2013) (attached as Exhibit E).

and underscored the feasibility of selective thinning as a more effective and cost-efficient method to reduce fire risk in eucalyptus forests. Chief Close describes the risks of increased fire subsequent to treating vegetation to remove canopy cover over large areas. Close, Kelly, "Hazardous Tree Reduction Draft Environmental Impact Statement (DEIS) *East Bay Hills, CA* – Fire Behavior Commentary," pp. 9-11 (June 17, 2013) (attached as Exhibit D). Chief Close explains that the selective thinning approach is a well-accepted hazard reduction practice in eucalyptus forests. *Id*., pp. 11-12, 18-22. Chief Close explains that taller eucalyptus trees actually help reduce fire hazard by breaking up strong winds and reducing the hazard from flying embers. *Id.*, p. 11 ("it has been found that eucalyptus trees actually help *reduce* fire hazard by breaking up turbulent flow dynamics of strong winds and reduce the hazard from flying embers"). Chief Close concludes that a selective thinning project, his "Combined Alternative Program," would reduce fire risk to a greater extent and less expense than canopy removal:

> [I]t is my opinion that the Combined Alternative Program approach is clearly a preferable alternative. It … follows sound forestry practices, is consistent with current accepted hazard fuel reduction practices for eucalyptus, does not result in an increase in invasive brush species post-treatment, deposits far less flammable woody material on the treatment sites, and is more economically sound.

Id. at 21.

The DEIR begrudgingly acknowledges that selective thinning is very effective at reducing fire risks. O9-17 cont.

> One published literature review found that certain treatments, such as hand or mechanical thinning followed by prescribed fire, or prescribed fire alone, are very effective at reducing wildfire severity, and that related ecological impacts are often neutral to positive (Winford et al. 2015). Another published literature review indicates that fuel treatments reduce fire severity, crown and bole scorch, and tree mortality compared to untreated areas. This finding is most applicable to the combination of thinning (manual and mechanical treatments) and prescribed burn treatments.

DEIR, p. 3.12-3. The DEIR attempts to walk this acknowledgment back, stating without citation that "[i]ncreased treatment size and intensity (e.g., number of trees removed) can increase the effectiveness of the treatments." *Id*. Again, one is left wondering what the FHR Projects actually are and the type and location of treatment methods the University proposes to use in each of those areas.

Although the University identifies various treatment methods at its disposal, the EIR's project-level review of the fire hazard reduction ("FHR") projects in Strawberry Canyon (Strawberry FHR Project), Claremont Canyon (Claremont FHR Project), and in areas along Frowning Ridge (Frowning FHR Project) does not indicate whether those methods would be used to selectively thin the FHRs, remove effectively all of the trees in these areas, or a specified combination of these options in specified areas of the FHRs. The trees comprising the forested areas with these projects are overwhelmingly eucalyptus trees. As currently proposed, the three projects may include cutting down effectively all of the trees in these three areas. The DEIR fails to acknowledge the scientific concerns regarding the fire risks of large-scale removal of trees in the Hills and fails to address the potentially significant fire risk impacts this management option will have within these large project areas. As a result, the DEIR also falls short of identifying mitigations of these impacts or presenting sufficient information for the University and public to compare alternatives, including a selective thinning alternative that would better achieve the project objectives in these project areas. O9-17 cont.

The DEIR's fire risk analysis boils down to the circular and unsubstantiated conclusion that because the WVMP and the FHR Projects are intended to induce fire risk, the fire risk posed by the WVFMP and each of the Identified Treatment Projects, including the FHRs, is less than significant. *See* DEIR, p. 3.12-15 ("Furthermore, one of the main objectives of the WVFMP is to reduce the frequency and severity of future uncontrolled wildfire. This impact would be less than significant for the overall WVFMP as well as the Identified Treatment Projects"); *Id*., p. 3.12-16 ("One of the primary purposes of the Identified Treatment Projects is to reduce wildfire risk. Thus, the potential for the Identified Treatment Projects to expose people or structures to uncontrolled wildfire or substantially exacerbate fire risk would be similar to that described above for the overall WVFMP. This impact would be less than significant."). Unfortunately, wishful thinking is neither substantial evidence nor a reasoned analysis. O9-18

The DEIR mentions the 2017 Grizzly Fire which burned 20 acres on the Hill Campus and required evacuations of nearby facilities. *See* DEIS, pp. 1-2, 3.12-4. The DEIR attempts to use the 2017 Grizzly Fire as an example of the need for increased fire safety in the Hill Campus. *Id*, p. 3.12-4. Although an example of the need for increased fire safety, the Grizzly Fire is ironically an example of how the University's prior efforts at canopy removal increase fire risks and how thinning of an adjacent eucalyptus grove can stop a fire from further spreading. Although not mentioned in the history of eucalyptus management included in the WVFMP (*see* WVFMP, pp. 14-15), the area where the Grizzly Fire occurred on Frowning Ridge was treated by University by removing the tree canopy in that area. The treatment occurred in 2005 and involved the complete eradication of about 1,900 eucalyptus trees over a roughly 11 acre area. Summary, Frowning Ridge Fuel Management Project - Phase 4 (attached as Exhibit F.) Photos taken by HCN's Dan Grassetti shortly after the Grizzy Fire show that most of the burned area was in the area previously treated by the University in 2005. The attached photos show that, rather than exacerbating the fire, the fire did not spread once it hit the few tall eucalyptus trees on the north edge of the burning area and the eucalyptus grove to the east across Grizzly Peak Road. *See* Exhibits G, H & I. In the case of the trees across Grizzly Peak Road, when the fire entered that area, it consumed all of the understory fuels, singed the lower parts of the eucalyptus tree trunks, and then went out. Exhibit H. No large trees burst into flame. The north side of Grizzly Peak Road is a eucalyptus forest area managed by East Bay Municipal Utility District ("EBMUD"), which relies extensively on thinning of these areas and removing of ground fuels rather than eradication. Where there was no ground fuel amongst the eucalyptus trees, the fire died out. Exhibit I. O9-19

What did burn in the Grizzly Fire were the dry grasses and chaparral remaining from the University's prior removals of eucalyptus and other trees. See Exhibit G. In addition, the dried out trees left on the ground from the University's previous tree cutting in 2005 did burn. *See* Exhibit J. These are the ignition materials that led to the evacuations and need for assistance from multiple fire departments. Thus, the Grizzly Fire is an example of how removing large numbers of trees from forested areas exacerbates fire risk for all of the reasons identified by the USFS, FEMA staff and Chiefs Close and Maloney. As is the case with those previous expert comments, the University and the DEIR turned a blind eye to this example of the fire risks of cut-over areas and the effectiveness of tree-shaded areas with management of ground fuels. O9-19 cont.

Given the University's failure to reasonably describe the FHR Projects and the type, location and implementation of planned vegetation treatments in those areas, the DEIR does not give itself or the public anything concrete from which to consider the resulting fire risk impacts. Under the vague criteria identified by the University, complete eradication may (and indeed given the University's prior proposals, likely will) be identified as the planned treatment of the FHRs going forward. Ignoring the long-standing, expert concerns regarding fire risks of large-scale tree removal in the Oakland Hills does not reasonably disclose fire risk impacts, never mind address appropriate alternatives and mitigations. "[O]mitting or ignoring contrary information is not the way to produce an adequate informational document." *Madera Oversight Coalition, Inc. v. County of Madera* (2011) 199 Cal. App. 4th 48, 57. For this reason, the DEIR is entirely inadequate. O9-20

IV. The DEIR Fails to Explain How Follow-Up Maintenance Work Will Maintain Any Reduced Fire Risk.

Because the University has failed to describe in any detail the extent of removal of trees within the FHR Projects, it is not possible to evaluate the reasonableness or effectiveness of the monitoring and performance criteria set forth in the WVFMP. Although the descriptions of the FHR Projects do not indicate which specific areas of the FHRs would be subject to thinning or eradication of eucalyptus and pine trees, the performance criteria set an "overall vegetation recruitment and retention goal for native plants is 80 percent." WVFMP, p. 86. Without knowing the extent and mix of vegetation removal, one cannot evaluate the merits of this performance criterion. Likewise, the goal of limiting the return of canopy cover to 10 percent for woody vegetation where it was removed cannot be understood without knowing where such wholesale removals are proposed. *Id*., p. 86. O9-21

In addition, the monitoring and performance criteria focus almost exclusively on maintaining the removals of non-native trees and plants. There are no performance criteria for native species that also pose significant fire risks in the East Bay hills. For example, there is only a stated concern that "exotic woody plant performance standards are being met." WVFMP, p. 81. Indeed, the unprecedented fires currently occurring in many parts of California, especially in and around the Bay area, are in habitats dominated by oak woodlands. The myopic attention to maintaining removals of non-native species omits any criteria for further treatment or removal of any native plants that increase in coverage over treated areas. There is no description of monitoring dangerous fire risk conditions that are posed by native vegetation. For example, native grasses, shrubs and trees have equal or greater flame length than even eucalyptus trees. *See* Close Report, p. 11 (Exhibit D). According to the Hills Emergency Forum, the flame lengths of oak/bay, brushes, and grass plant communities range from 17.5 to 41.5 feet in height compared to 13.5 feet for eucalyptus and 9 feet for Monterey pine. *Id*. In addition, areas treated to remove eucalyptus in Claremont Canyon in the past have not been transformed into no risk fire areas. Indeed, photographic evidence gathered by HCN and others over the years shows that highly flammable materials prone to ignition have been allowed to grow adjacent to active use areas. Exhibit L. To be effective, the WVFMP must address the fire risks of native vegetation as well as non-native. O9-21 cont.

Not surprisingly, this omission is carried over into the DEIR. In addition to failing to provide modeling comparing the effectiveness of selective thinning and eradication, and combinations of those options, there also is no modeling of the subsequent vegetation that would grow subsequent to those treatment options.[3] Selective thinning would have a different type of regrowth than areas where eradication of trees will occur. The DEIR assumes that post-treatment monitoring will be able to keep up with changes in vegetation that will result from tree removal. The DEIR further assumes that wherever native plants emerge, fire risks are addressed. *See* DEIR, pp. 3.12-3 – 4. However, as Chief Close has explained, "[w]ildland fuel complexes are inherently dynamic. Several critical factors will change over time that in turn will change the fire hazard, both in nature and degree of severity." Close Report, p. 15. In order to evaluate the fire risks that will result from, for example, eradicating large areas of trees, model runs looking ahead 5 to 10 years must be done to evaluate and compare the fire risk results of various intensities of tree removal. *Id*. O9-22

V. The DEIR Fails to Reasonably Address Impacts to the Threatened Alameda Whipsnake.

The DEIR's treatment of potential impacts to Alameda whipsnake again demonstrates the University attempting to avoid confronting difficult environmental issues rather than highlighting them, as intended by CEQA. Thus, although the DEIR acknowledges the presence of the threatened Alameda whipsnake, no effort at establishing a clear baseline of the snake's presence and its abundance within the Project area is attempted. In addition, the University fails to explain how it can proceed with the proposed WVFMP and the Identified Treatment Projects without first obtaining an incidental take permit to maintain the University's compliance with the federal Endangered Species Act. O9-23

[3] Notably, the modeling of existing conditions conducted by the University indicates that even the treated areas, such as at Signpost 29, where large trees have been removed, remains a high fire danger area. *See* ____.

A. The DEIR Fails to adequately disclose the environmental baseline for the Alameda whipsnake.

Although the University retained consultants to conduct baseline surveys for various species within the FHRs and other WVFMP areas, no such detailed baseline surveys were conducted for the threatened Alameda whipsnake. Thus, field survey reports have been provided for special status plants (Appendix E-1), vegetation communities (Appendix E-4), California red-legged frog (Appendix E-2), and San Francisco dusky-footed woodrat nests (Appendix E-3). However, for the Alameda whipsnake, the DEIR relies instead on general information and assessments of habitat suitability for the snakes, especially in the FHRs. This is odd given that the Alameda whipsnake poses the greatest challenge to the University's implementation of its vegetation management plans without taking or otherwise harming this federally-listed species. The only survey reports cited by the DEIR regarding the snakes is for two live-trapping surveys done on properties in Dublin and in northwestern Contra Costa County. SBI, 2000; SBI2012.

The CEQA "baseline" is the set of environmental conditions against which to compare a project's anticipated impacts. *Communities for a Better Environment v. So. Coast Air Qual. Mgmnt. Dist.* (2010) 48 Cal.4th 310, 321. Section 15125(a) of the CEQA Guidelines (14 C.C.R., § 15125(a)) states in pertinent part that a lead agency's environmental review under CEQA: O9-24

> "…must include a description of the physical environmental conditions in the vicinity of the project, as they exist at the time [environmental analysis] is commenced, from both a local and regional perspective. This environmental setting will normally constitute the baseline physical conditions by which a Lead Agency determines whether an impact is significant."

See, *Save Our Peninsula Committee v. County of Monterey* (2001) 87 Cal.App.4th 99, 124-125 ("*Save Our Peninsula*.") By failing to ascertain any baseline for the threatened Alameda whipsnake in the FHRs and other areas of the WVFMP, the University cannot properly disclose the impacts of the WVFMP and FHR projects and has failed to address potential impacts to the whipsnake.

B. The Identified Treatment Projects will violate ESA by creating an imminent threat of harm to Alameda whipsnake without obtaining an incidental take permit under the Endangered Species Act.

The most glaring omission in the DEIR of impacts to the whipsnake is its failure to address likely impacts to the snake should the Identified Treatment Projects, especially the FHRs, include the complete eradication of eucalyptus and pine trees. According to the USF&WS, removal of existing canopy in the eucalyptus forests would result in the presence of O9-25 Alameda whipsnakes in these areas. Biological Opinion ("BO"), p. 114. In contrast, thinned eucalyptus forest would not be suitable whipsnake habitat. *See Id*., p. 117. Thus, assuming the University's FHR Projects include eradication of eucalyptus and other non-native tree species, any post-treatment maintenance may adversely impact the whipsnake. USF&WS confirmed this in their Biological Opinion for UC's original FEMA project. "UCB follow-up vegetation treatment and maintenance activities may result in the temporary displacement of Alameda whipsnakes and disruption of feeding, sheltering, and breeding activities over a total of 263.8 acres of restored habitat for the Alameda whipsnake at Strawberry Canyon, Claremont Canyon, and Frowning Ridge for between 4 and 18 days every year over the 10-year period (Table 16)." Biological Opinion, p. 114. In addition, "[h]igh-impact activities involving the use or staging of heavy machinery (*e.g.*, tree and shrub removal) within suitable habitat for the Alameda whipsnake, … may crush Alameda whipsnakes or their burrows resulting in the injury or mortality of Alameda whipsnakes." *Id*., p. 100. These likely impacts are not discussed in the DEIR. Instead, the DEIR only emphasizes the potential benefits of expanding habitat for the whipsnake while completely sidestepping the adverse impacts that would result from repeated subsequent maintenance and incursions into these areas. DEIR, p. 3.5-42. O9-25 cont.

The DEIR also fails to explain how the University will comply with the federal Endangered Species Act ("ESA"), 16 U.S.C. § 1531, *et seq*. A lead agency may not approve a project with significant unavoidable impacts unless it is "otherwise permissible under applicable laws and regulations." PRC § 21002.1(c). The DEIR admits that the Project will have numerous significant unavoidable adverse environmental impacts. *See* DEIR, p. 5-1. Because the University has not applied for an incidental take permit under Section 10 of ESA, 16 U.S.C. § 1539, nor taken any steps to prepare the prerequisite habitat conservation plan for obtaining a permit, the University will not be in a position to approve the WVFMP and the FHR Projects because any eradication of eucalyptus forests would require an incidental take permit under ESA in order to maintain and further treat those areas under the WVFMP. This legal problem would be avoided by the University by clarifying that the FHR Projects and other Identified Treatment Projects employed only selective thinning, ground fuel controls, and maintained the tree canopy. As USF&WS emphasizes, thinned eucalyptus forests would not create suitable habitat for Alameda whipsnakes. *See* BO, p. 117 ("proposed thinning of eucalyptus forest is not likely to result in a significant increase in PCEs because 50 percent of the eucalyptus canopy cover would be retained in EBRPD treatment areas…"). Until and unless the DEIR clarifies and evaluates the actual tree removal proposed for the FHRs, the possibility of complete eradication requires the University to prepare an HCP and obtain an incidental take permit. O9-26

VI. The DEIR's Identification and Discussion of Alternatives is Unreasonable and Contrary to CEQA.

One of CEQA's fundamental requirements is that the DEIR must identify the "environmentally superior alternative." 14 Cal.Code Regs. §1526.6(e)(2); Kostka & Zischke, *Practice Under the California Environmental Quality Act* §15.37 (Cont. Educ. Of the Bar, 2008). As a result, the University may not design the alternatives considered by the DEIR to include elements that would make alternatives easy to reject. "The purpose of an EIR is ***not*** to identify alleged alternatives that meet few if any of the project's objectives so that these alleged alternatives may be readily eliminated." *Watsonville Pilots Assn. v. City of Watsonville* (2010) 183 Cal.App.4th 1059, 1089 (emphasis supplied). "Since the purpose of an alternatives analysis is to allow the decision maker to determine whether there is an environmentally superior alternative that will meet most of the project's objectives, the key to the selection of the range of alternatives is to identify alternatives that meet most of the project's objectives but have a O9-27 reduced level of environmental impacts." *Id*. In *Watsonville Pilots*, the Court of Appeal made clear that it was incumbent under CEQA for the City: O9-27 cont.

> to include within its alternatives analysis a reduced development alternative that would have satisfied the 10 objectives of the project that did not require the level of development contemplated by the project. Analysis of such an alternative would have provided the decision makers with information about how most of the project's objectives could be satisfied without the level of environmental impacts that would flow from the project.

Id.

The DEIR identifies three alternatives to the proposed WVFMP Project, including a no project alternative. There are no alternatives specifically provided to evaluate the FHR Projects. O9-28

Alternative A, entitled the "McBride Plan Alternative," includes the treatment of 400-500 acres of Strawberry and Claremont Canyons and conversion of those areas to native vegetation, various areas of non-shaded fuel breaks, no chipping of trees, and miscellaneous infrastructure improvements. DEIR, p. 6-12. Because it is unclear what the University is proposing for specific treatments to be conducted in the FHRs, it is not possible to determine whether Alternative A differs from the Project. The University does claim, again without specificity, that: O9-29

> UC Berkeley currently removes exotic trees and vegetation, including eucalyptus, Monterey pine, and French broom seedlings, which is similar to the eucalyptus and conifer conversion under Alternative A, although the locations and areal extent of specific treatments may differ.

DEIR, p. 6-13. Assuming that is an accurate statement, Alternative A does not appear to encompass an alternative distinctive from the proposed Project.

Alternative B, entitled the "Reduced Treatment Alternative," would utilize only shaded fuel breaks within 100 to 200 feet from roadways and structures and would be limited to manual treatments, and would not use any herbicides. DEIR, p. 6-20. The DEIR claims that Alternative B is the same as the alternative outlined by HCN in its scoping comments. *Id*. Alternative B does capture some of the key elements of HCN's proposed alternative. These include maintaining the forest canopy, relying on selective thinning within 200 feet of roadways and structures, and removing of ladder fuels and ground fuels in these zones. See HCN Scoping Comment (Dec. 20, 2019). However, nothing in HCN's alternative saddles its alternative with a restriction limiting the work to manual treatments without the aid of mechanical treatment. *Id*. O9-30

Alternative B does provide a true alternative to the proposed Project because it provides clarity that selective thinning will be used for the portions of the FHRs within 100 to 200 feet of roadways and structures. This Alternative would preclude the wholesale eradication of large trees and removal of the existing tree canopy. There would be no treatment more than 200 feet away from roads and structures within the FHRs. The alternative also would implement shaded, rather than non-shaded, fuel breaks and temporary refuge areas.

The University acknowledges that "Alternative B would implement evacuation route treatments, shaded fuel breaks, and fire hazard reduction treatments by thinning vegetation and removing ground and ladder fuels throughout the Hill Campus to reduce the risk of wildfire." DEIR, p. 6-20. The DEIR also acknowledges that "[b]ecause Alternative B would treat the same area as the WVFMP using similar but substantially fewer vegetation treatment types and activities, this alternative is potentially feasible." *Id*., p. 6-21.

However, the additional constraint of only using manual treatment added to HCN's proposal by the University is used to justify reasoning that Alternative B's effectiveness and feasibility are questionable as well as its relative impacts. Thus, by hobbling Alternative B with manual treatment, the University claims it will take substantially longer to implement than the Project, prolonging the areas exposure to fire risk. DEIR, p. 6-20. Rather than allowing mechanical and manual treatment for this alternative, the University has unreasonably set up Alternative B to be easily rejected, contrary to the reasonableness standard and University's duty to craft alternatives that attempt to minimize environmental impacts. *Watsonville Pilots Assn.*, 183 Cal.App.4th at 1089.

The EIR further claims that Alternative B suffers from a lack of specificity compared to the Project. As discussed above, there is no specificity whatsoever in the DEIR or WVFMP describing what types of treatment will occur in what areas of the Plan. Essentially any treatment type could happen anywhere under the Project. To the contrary, Alternative B specifies a selective thinning treatment. This rationale asserted by the University is not supported by the rest of the DEIR or any substantial evidence. O9-30 cont.

Most blatantly, by limiting Alternative B to manual treatment only, the University then relies on that restriction to conclude that Alternative B "would not attain objectives that call for a variety of vegetation treatment activities that could be selected based on effectiveness and other factors because it only includes manual treatment…" DEIR, p. 6-21. This is a blatant poison pill which entirely undermines the point of an alternatives analysis. Alternative B and the use of selective thinning to achieve the Project's fire risk reductions does not preclude the use of any of the various vegetation treatment activities described in the DEIR. Both manual and mechanical treatments should be used. Managed herbivory and controlled burns would not be precluded as tools to achieve selective thinning and shaded fuel breaks. Only the University's decision to arbitrarily include a prohibition on using certain treatments provides it the pretense to reject Alternative B.

The University asserts that, although Alternative B "would reduce the risk of wildfire in the long-term, it would not be as effective as the WVFMP at reducing wildfire risks" and attain the primary objective of the Project. DEIR, p. 6-21. The DEIR then asserts it would not achieve the objectives "to the same degree as the WVFMP" because of its reliance only on manual treatments. "[B]ecause Alternative B would be implemented entirely using manual treatment activities, which would take more time to achieve wildfire risk reduction relative to the WVFMP, it would not increase the pace of implementation. This alternative would not be consistent with this objective to the same degree as the WVFMP." *Id*. Again, only because of that arbitrary restriction – manual treatment – would treatments under Alternative B take longer and require O9-31 larger crews. *Id*. Nor is there evidence to support even that assertion. The areas to be treated would be reduced under Alternative B. The University provides no analysis showing how the numbers of crews would increase under that proposal. Nor is it logical that preventing regrowth of less removed vegetation would be more difficult than preventing regrowth of greater areas of vegetation. O9-31 cont.

While on the one hand adding the "manual treatment only" element to Alternative B in order to manufacture a rationale for the University to try to justify its rejection, the University also omits a few other components from its version of Alternative B – not because HCN said they should not be included or would not make sense to include – but simply to be able to say Alternative B is incomplete and thus, subject to rejection. For example, the University chooses not to include an adaptive management component for Alternative B. Why not? HCN's alternative did not say the University should not apply adaptive management to implement or maintain treated areas. Indeed, logically, the same process would apply as is proposed by the Project. Indeed, under Alternative B, the process of monitoring and need for adjustments over time would be the same as the Project (though fewer problems would likely arise). O9-32

Likewise, the University adds a prohibition of managed herbivory to Alternative B, a constraint not proposed by HCN's original alternative. The University then claims, along with its manual treatment constraint and the proposal not to use pesticides in this alternative, that Alternative B "would require frequent follow-up treatments to maintain treated areas and prevent regrowth of removed vegetation…." DEIR, p. 6-21. Alternative B should include managed herbivory, especially to maintain treated areas. By adding this constraint, the University only seeks to tip the scales towards a blanket "no" of anything but its proposal, rather than a reasonable effort to explore reasonable alternatives that would feasibly achieve its objectives with less impacts on the environment. O9-33

Lastly, the University cites to Alternative B's proposal that no pesticides be used to claim that would be less feasible. In terms of a reasonable alternative, it seems rather obvious that, to the extent the University has evidence to support this claim, the University should be evaluating Alternative B with an adjustment to allow pesticide use. HCN does not believe the University has provided evidence to show that herbicide use is necessary to prevent eucalyptus regrowth or that non-pesticide measures are infeasible. For example, the University's immediate neighbor above Grizzly Peak Road – EBMUD - has been managing the eucalyptus forest using selective thinning and without pesticide applications. EBMUD, East Bay Watershed Master Plan, p. 52 ("Prior to any harvest activities, ensure that adequate stump-sprouting control methods are available to reduce fire hazards and protect water quality. ***Herbicides will not be used to control stump resprouts***") (emphasis added) (https://www.ebmud.com/recreation/east-bay/east-bay-watershed-master-plan-update/) (Exhibit K (excerpt)). As the Grizzly Fire exemplifies, EBMUD's efforts have proven very effective not only to control but, in that case, stop a fire which began on the University's lands where 1,900 trees were removed. O9-34

Nor does the University discuss or provide any evidence showing the relative costs of its proposed Project with Alternative B. Removing large trees is very expensive. Close Report, p. 19 O9-35

(Exhibit D). Ample evidence is available showing that a selective thinning alternative would be much less costly than completely removing all or almost all trees in the FHRs. As Chief Close has pointed out, the cost of EBRPD's vegetation management focused on selective thinning is less than half the per acre cost of completely removing all trees in the Strawberry and Claremont FHR areas. Exhibit D. The DEIR should assess the relative costs in order to reasonably compare the feasibility of its proposed Project and Alternative B. O9-35 cont.

The lead agency is required to select the environmentally preferable alternative unless it is infeasible. Including the arbitrary limitations placed on Alternative B, the DEIR concludes that "Alternative B would be the environmentally superior alternative…." DEIR, p. 6-24. The DEIR focuses on the absence of mechanical treatment and prescribed burning as the basis for the reduced impacts. *Id*. However, the same conclusion would result even with mechanical treatment in Alternative B. Because Alternative B would remove less vegetation and fewer trees from fewer areas within the FHAs, it would still have substantially less impacts from mechanical treatment compared to the proposed FHA Projects. Likewise, for the FHAs, because no prescribed burning is called for in the proposed FHA projects, its absence in Alternative B would not make Alternative B more impactful. Most importantly, by limiting the area of intense tree removal, Alternative B will have substantially fewer impacts on Alameda whipsnakes and other wildlife than the proposed FHR projects. DEIR, p. 6-25 (Table 6-2). And, as discussed above, there is no evidence that a selective thinning alternative would be less effective than whatever range of tree removal (from selective thinning to complete eradication) the University may be proposing for the FHR Projects. Instead, the evidence shows that maintaining shaded fuel breaks and management of ground fuels would create less fire risks than the potential complete eradication that the University is contemplating. Likewise, there is no evidence that the GHG impacts of Alternative B would be greater than the proposed Project. Again, fewer treated areas results in fewer emissions. Likewise Alternative B's lower risk of fire amounts to lower GHG emissions in the future. Thus, because Alternative B is feasible and is the environmentally superior alternative, the University is required by CEQA to select that alternative as the approved FHR Project. O9-36

CONCLUSION

Thank you for this opportunity to comment on the draft EIR and proposed Project. We look forward to reviewing the University's responses to these comments and having an opportunity to review a recirculated DEIR incorporating substantial changes to its discussion and analysis and the proposed Project which address the significant shortcomings identified above. O9-37

Sincerely,

Michael R Lozeau

Michael Lozeau
Lozeau Drury LLP
on behalf of Hills Conservation Network

EXHIBIT A

AMSET Comments following review of issues related to East Bay Hills Hazardous Fire Risk Reduction Draft EIS

Prepared by US Forest Service, Adaptive Management Services Enterprise Team
September 27, 2013

It's evident that the current condition of natural fuels in the wildland urban interface of the East Bay Hills poses a significant risk from wildland fire. Given the increased fire risk brought by the presence of eucalyptus trees in the East Bay Hills, complete removal of this species would seem to be an effective means of reducing such risk. However, complete removal of overstory trees can introduce changes to the environment which increase fire behavior in undesirable ways. First, the removal of the overstory, is likely to result in rapid establishment of native and non-native herbaceous and brush communities, bringing an increase in available surface fuels. Secondly, removal of the overstory will result in changes to environmental factors which are known to cause increases in fire behavior.

Background

The East Bay Hills, like many areas throughout California, are prone to fire which is a natural disturbance force that has shaped the landscape. The East Bay Hills are prone to fast moving, high intensity fires, due to the occurrence of natural shrublands, dominated by naturally occurring coyote brush (*Baccharis pilularison)*, as well as highly flammable blue gum eucalyptus *(Eucalyptus globulus)*, a non-native species which was introduced to the area in the early 1900's. It's our understanding after review of the Draft EIS, and associated comments, that the project proposes to mitigate the risk of wildland fires in the East Bay Hills wildland urban interface by removal of most or all of the eucalyptus overstory within the project area.

Non-native eucalyptus found in the project area undoubtedly contributes to high risk wildfires in this area. Features of bluegum eucalyptus that promote fire spread include heavy litter fall, and flammable oils in the foliage. The bark catches fire readily, and deciduous bark streamers and lichen epiphytes tend to carry fire into the canopy which tends to send out flying embers that area carried by the wind and result in the development of spot fires that ignite in advance of the fire's leading edge (Ashton 1981). While acknowledging these significant issues, there are undesirable effects of removing the eucalyptus overstory which deserve careful consideration.

Increase in Brush

A cursory literature review indicates that removal of eucalyptus stands in the East Bay Hills is likely to result in a colonization of those sites by a combination of native and non-native herbaceous and chaparral communities (native Baccharis, and invasive broom species). A study by Keeley (2005) shows that shrublands are expanding in the San Francisco East Bay region due to limited environmental controls from fire and grazing. According to Keeley's study, fire has never been frequent enough to act as a significant factor limiting brush communities in the area. He states that in the past, grazing pressure has been the force keeping brushlands in check. With reduced grazing pressure during the latter half of the 20^{th} century, grassland communities are being replaced by brushland communities.

Overstory trees limit the ability of understory species to become established by limiting sunlight, moisture, and nutrient resources that are required. Removal of the eucalyptus overstory would increase sunlight, and reduce the competition for moisture and nutrients. Without significant controls in place the result would likely be rapid introduction and expansion of brushland species, and thus, increases in live surface fuel loading into areas where the eucalyptus overstory is removed.

Increase in Fire Behavior

Increases in live surface fuel loads result in increases in potential surface fire behavior. According to Russell and McBride (2003), the natural succession from grasslands to Baccharis shrublands in the East Bay Hills indicates a dramatic increase in fire hazard for those areas. On productive sites, Baccharis often exceeds two meters high (Russell and Thompkins, 2005). According to The U.S. Fire Administration Technical Report on the 1991 East Bay Hills Fire, brush fuel types played a significant role in the progression of the fire: "The brushland would probably make up a large portion of the available fuel, particularly in the northeastern portion of the fire area."

Managing Wildland Fuels

Wildfires pose major risks to people property and ecosystem attributes in many parts of the world. While there are many different facets of management aimed at reducing wildfire risk, the treatment of natural fuel is pivotal to this aim (Reinhardt et al., 2008). Fuel treatments are designed to alter the arrangement and quantity of fuel in order to reduce the likelihood of ignition, rate of spread and intensity of wildfires. Methods vary from clearing vegetation, mechanical thinning of trees to prescribed fire.

Creating more fire resilient stands implies a three-part process of reducing surface fuels, reducing ladder fuels, and reducing crown density (Agee and Skinner 2005). Harvest alone only treats the ladder and canopy fuels and does little to address the surface fuels which are typically the primary carrier of an advancing fire. Slashing, combined with biomass utilization or grapple-piling and pile burning are also effective methods of treating surface fuels, both natural and activity created. However, it is not as effective in reducing the fine fuel loading (the smallest branchwood material) as is prescribed fire.

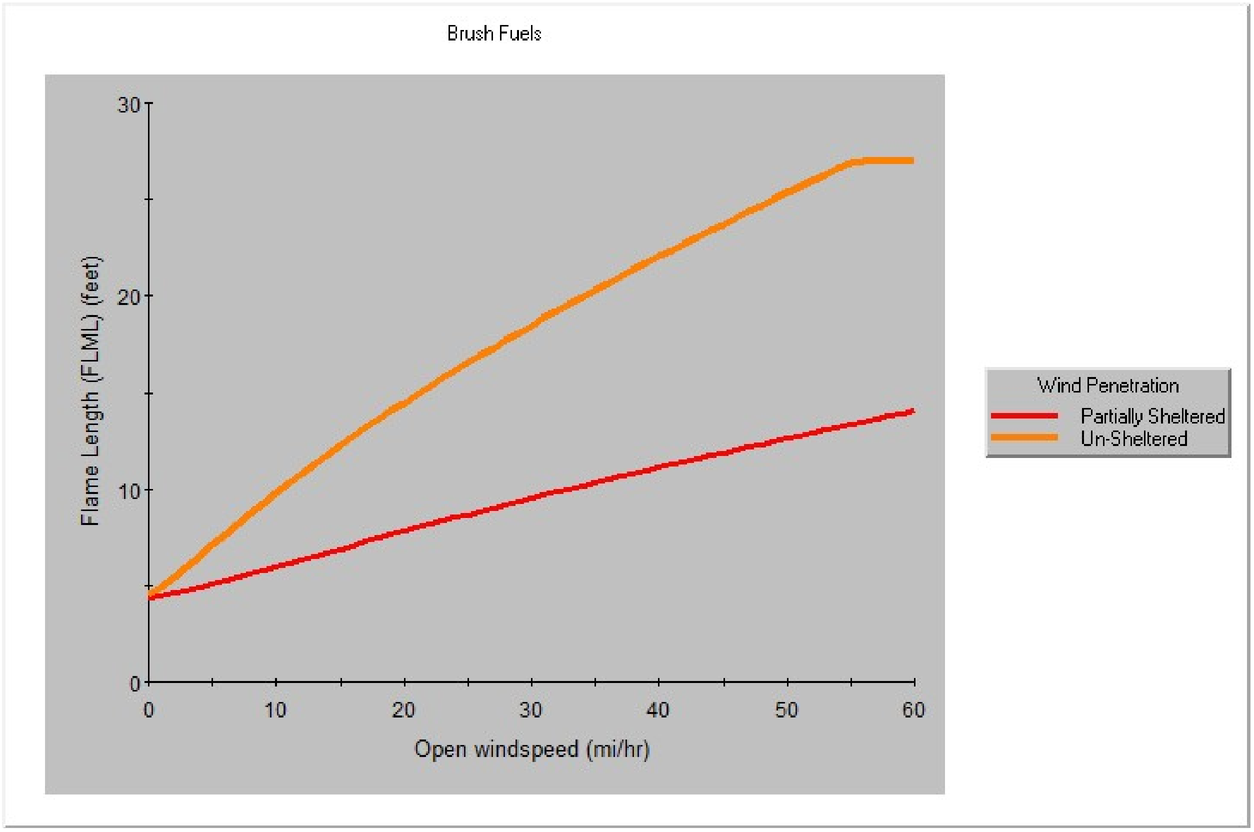
The effectiveness of treatment in reducing fuels and altering fire behavior is dependent on the type and intensity of treatment. The length of individual treatment effectiveness for these types of fuel treatments will range from 7 to 15 years dependent on initial treatment levels (Finney et al. 2007, Graham et al. 2004). Fuel reduction activities that include the use of prescribed fire are generally the most successful in reducing fuels (Graham et al. 1999).

In areas dominated by eucalyptus, studies in Australia suggested that the amount of fine fuel (<6 mm diameter) available on the forest floor (i.e. fuel consumed by the fire) was the most significant fuel variable affecting the behavior of fires in eucalyptus forests. These authors claimed that the rate of spread of the head fire is directly proportional to the load of fine fuel consumed. If the rate of spread is directly proportional to fuel load, then reducing the fuel load by half, halves the rate of spread and reduces the intensity of the fire fourfold. This relationship between fuel load, rate of spread, and fire intensity has provided a simple but powerful argument to support fuel reduction burning in eucalyptus forests for more than 50 years. (Gould et al. 2011). In the Berkeley–Oakland Hills, fuel buildup occurs very rapidly, 95% of equilibrium reached in 27 years in un-managed eucalyptus stands (Agee, 1973). To maintain low fuel levels a fuel reduction program should be implemented.

From a fire behavior standpoint commercial thinning from below that would target smaller diameter trees leaving the largest dominate trees on the landscape, followed by surface and ladder fuel treatments provides the highest level of reduction in potential fire behavior. These treatments and combinations of these treatments would break up the horizontal and vertical continuity from the surface fuels to the canopy fuels, by increasing canopy base height, and reducing canopy bulk density thus reducing the likelihood of crown fire ignition. Aerial fuels separated from surface fuels by large gaps are more difficult to ignite, thus requiring higher intensity surface fires, surface fires of longer duration, or ignition from spotting to ignite the crowns, and of course wind.

Removal of the eucalyptus overstory would reduce the amount of shading on surface fuels, increase the wind speeds to the forest floor, reduce the relative humidity at the forest floor, increase the fuel temperature, and reduce fuel moisture. These factors may increase the probability of ignition over current conditions.

Furthermore, complete removal of the eucalyptus overstory would result in increases in wind speed which result in a more severe range of fire behavior effects as previously mentioned above. The following illustration is an example of predicted or anticipated flame length for a partially sheltered and an un-sheltered brush fuel model to illustrate lower wind speeds for a thinned stand versus higher wind speeds found with complete removal of eucalyptus trees.



Agee, J. K.; Wakimoto, R. H.; Darley, E. F.; Biswell, H. H. 1973. Eucalyptus fuel dunamics, and fire hazard in the Oakland Hills. California Agriculture. 27(9): 13-15.

Agee,J.K., Carl N. Skinner, Basic principles of forest fuel reduction treatments, Forest Ecology and Management, Volume 211, Issues 1–2, 6 June 2005, Pages 83-96, ISSN 0378-1127, http://dx.doi.org/10.1016/j.foreco.2005.01.034.(http://www.sciencedirect.com/science/article/pii/S0378112705000411)

Ashton, D. H. 1981. Fire in tall open-forests (wet sclerophyll forests). In: Gill, A. M.; Groves, R. H.; Noble, I. R., eds. Fire and the Australian biota. Canberra City, ACT: The Australian Academy of Science: 339-366.

Gould, J.S., W. Lachlan McCaw, N. Phillip Cheney, Quantifying fine fuel dynamics and structure in dry eucalypt forest (Eucalyptus marginata) in Western Australia for fire management, Forest Ecology and Management, Volume 262, Issue 3, 1 August 2011, Pages 531-546, ISSN 0378-1127, http://dx.doi.org/10.1016/j.foreco.2011.04.022. (http://www.sciencedirect.com/science/article/pii/S0378112711002374)

Finney, M. A., R. C. Seli, C. W. McHugh, A. A. Ager, B. Bahro, and J. K. Agee. 2007. Simulation of long-term landscape-level fuel treatment effects on large wildfires. International Journal of Wildland Fire, v. 16, no. 6, p. 712-727. 10.1071/.

Graham, Russell T.; Harvey, Alan E.; Jain, Theresa B.; Tonn, Jonalea R. 1999.
The effects of thinning and similar stand treatments on fire behavior in Western forests. Gen. Tech. Rep. PNW-GTR-463. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 27 p.

Graham, Russell T.; McCaffrey, Sarah; Jain, Theresa B. (tech. eds.) 2004. Science basis for changing forest structure to modify wildfire behavior and severity. Gen. Tech. Rep. RMRS-GTR-120. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 43 p.

Keeley, J.E., "Fire history of the San Francisco East Bay region and implications for landscape patterns", International Journal of Wildland Fire, 285-296 (2005) .

Reinhardt, E.D., Keane, R.E., Calkin, D.E., Cohen, J.D., 2008. Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States. For. Ecol. Manag. 256, 1997–2006.

Russell W, Tompkins R., 2005. *Estimating biomass in coastal Baccharis pilularis dominates plan communities. Fire Ecol. 2005;1:20-27.*

Russell, W. H. and J. R. McBride. 2003. Landscape scale vegetation-type conversion and fire hazard in the San Francisco Bay area open spaces. Landscape & Urban Planning 64:201-208.

United States Fire Administration Technical Report, USFS-TR-060/October 1991. The East Bay Hills Fire, Oakland-Berkeley, California

EXHIBIT B

From: Gladwell, Angela
To: DiVittorio, Antoinette
Cc: Blanton, Emily; Leahy, Kristin
Subject: RE: East Bay Hills
Date: Wednesday, October 30, 2013 7:12:08 PM

Great! Thank you for being on and for providing such a timely update.

Sent from my iFEMA mobile device.

-----Original Message-----
From: DiVittorio, Antoinette
Sent: Wednesday, October 30, 2013 06:38 PM Eastern Standard Time
To: Gladwell, Angela
Cc: Blanton, Emily; Leahy, Kristin
Subject: RE: East Bay Hills

Angie,

The discussion went very well today. Theresa and Bill were on the entire call and David joined in later.

In summary:

- Public comments have undergone review and organization. FEMA SMEs and regional environmental staff reviewed and categorized them by whether further action was required by FEMA, other agencies, substantive, nonsubstantive etc. and into six categories: water quality and erosion; herbicide; air quality/climate change; fire modules and fuel; biological resources, and; other alternatives. In order to respond to comments FEMA was unable to respond to in-house, questions were formulated for distribution to the cooperating agencies and applicants/subapplicants in which FEMA expects to receive responses by the end of November. FEMA is formulating responses to all policy related comments.
- Based on the comments received, FEMA evaluated the alternatives to see if they meet the Purpose and Need and grant eligibility requirements. Numerous scientific studies and the fire modeling supported that thinning reduces fire risk and that the eradication approach, or clearing of overstory trees does not, and can in fact, increase different fire risks. FEMA, despite our best efforts, could not find a rational basis to discount the studies and consequently determined that we could not justify the eradication or overstory clearcutting approach and cannot fund those portions of the project. Selective thinning is also preferred because it has less potential for serious negative environmental impacts.
- Three PDM grants from two subapplicants (UC Berkeley and City of Oakland) need revision to a more unified methodology of fire reduction and maintenance plan meeting purpose and need. Scope is the same. UC Berkeley needs to give a new alternative. Location is most important and numbers less. The approach needs to be based on modeling and FEMA cannot provide it, however, we are happy to help. Joan Flack can help. We can provide the comments, SMEs contact info, and talking points. These changes need to first go through

the State. Looking to get new methodology within two weeks. Once received, FEMA can respond to public comments accordingly.

- Reminder to the subapplicants: answers to questions on public comments need to be addressed using the unified approach. Once answers are received from external sources, the contractor will be reengaged to modify the EIS where necessary and incorporate the comments/responses.
- We expect to receive responses to the distributed comments by the end of November. Once we receive the responses and have formulated our legal regulatory responses, FEMA will reengage the contractor to modify the EIS where necessary.
- Once the EIS if finalized, we can publish the Final, wait the 30 days, and develop/publish the ROD.
- Finally, it was noted that this is FEMA's internal review process and nothing will be made public until the ROD is published.

Thank you,

Antoinette DiVittorio
HMA EHP Coordinator
Office of Environmental Planning and Historic Preservation
DHS/FEMA/FIMA
Desk: 202.646.5796
Cell: 202.213.7692

From: Blanton, Emily
Sent: Wednesday, October 30, 2013 2:46 PM
To: DiVittorio, Antoinette
Subject: FW: East Bay Hills

FYI – see below. Would you be available for the call just in case?

From: Gladwell, Angela
Sent: Wednesday, October 30, 2013 2:44 PM
To: Blanton, Emily
Cc: Leahy, Kristin
Subject: RE: East Bay Hills

Kristin and I are talking to Sally at 3:30.
I told her we would not be participating and she understood. Unless something comes out of that call to change our minds, we will not participate.
It would be good to know her availability to participate though in case something changes.

Angie

Angela R. Gladwell
Director/Office of Environmental Planning and Historic Preservation

FEMA/DHS
1800 S. Bell St. Arlington, VA
angela.gladwell@dhs.gov/202-646-3193/202-646-4033 (fax)

From: Blanton, Emily
Sent: Wednesday, October 30, 2013 2:40 PM
To: Gladwell, Angela
Cc: Leahy, Kristin
Subject: FW: East Bay Hills

Hi Angie,
What are your thoughts on this? Antoinette already contacted Sandro to indicate that OEHP HQ will not be participating.

From: DiVittorio, Antoinette
Sent: Wednesday, October 30, 2013 1:31 PM
To: Blanton, Emily
Subject: East Bay Hills

Hi Emily,

Kristin forwarded me the invite for the meeting today with the coordinating agencies as an FYI. Do you know if Angie's expectation is that I not call in, or is our (OEHP) not attending only relative to in-person attendance?

Thank you,

Antoinette DiVittorio
HMA EHP Coordinator
Office of Environmental Planning and Historic Preservation
DHS/FEMA/FIMA
Desk: 202.646.5796
Cell: 202.213.7692

EXHIBIT C

Michael R. Lozeau (CA Bar No. 142893)
Richard T. Drury (CA Bar No. 163559)
Meredith S. Wilensky (Cal. Bar No. 309268)
LOZEAU DRURY LLP
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Attorneys for Petitioner/Plaintiff Hills Conservation Network, Inc.

SUPERIOR COURT FOR THE STATE OF CALIFORNIA

IN AND FOR THE COUNTY OF ALAMEDA

HILLS CONSERVATION NETWORK, INC., a public benefit corporation, Petitioner and Plaintiff, v. THE REGENTS OF THE UNIVERSITY OF CALIFORNIA, an agency of the State of California; NICHOLAS B. DIRKS, in his official capacity as Chancellor of the University of California, Berkeley; EMILY MARTHINSEN, in her official capacity as Assistant Vice Chancellor of the University of California; and JANET NAPOLITANO, in her official capacity as President of the University of California, Respondents and Defendants.	Reservation No. R-1782930 Case No. RG16823477 ASSIGNED FOR ALL PURPOSES TO: JUDGE FRANK ROESCH DEPT. 24 **DECLARATION OF DAVID MALONEY IN SUPPORT OF PLAINTIFF'S APPLICATION FOR A TEMPORARY RESTRAINING ORDER, ORDER TO SHOW CAUSE REGARDING PRELIMINARY INJUNCTION, AND STAY** Hearing Date: September 26, 2016 Time: 4:00 p.m. Dept: 24

I, David Maloney, declare as follows:

1. I am a resident of Contra Costa County. I hold lifetime certifications from the California State Fire Marshall's Office as a Fire Investigator and from the U.S. Department of Defense as a Fire Inspector. From 1989 through 1996, I was employed by the Department of Defense, U.S. Army, as Chief of Fire Prevention at the Oakland Army Base. During my tenure as Chief at the Army Base, the 1991 Oakland Hills Fire occurred, the largest urban fire in the history of the United States. Subsequent to the 1991 Oakland Hills Fire, I was appointed to serve on the Oakland-Berkeley Mayors' Task Force on Emergency Preparedness and Community Restoration, a group that was formed to investigate the 1991 Oakland Hills Fire, determine its causes, and provide recommendations to ensure there would be no re-occurrence of another major fire in the East Bay hills. Prior to my work with the U.S. Army, I was employed as a firefighter with the Oakland Fire Department.

2. Over the last six months and on many occasions in the past, I have visited Claremont Canyon, Strawberry Canyon and the Frowning Ridge area. In preparing this declaration, I have reviewed documents made available by the University of California or other agencies including the Addendum, the environmental impact statement prepared by the Federal Emergency Management Agency, comments on that EIS submitted by the U.S. Forest Service, the U.S. Environmental Protection Agency, URS, Chief Kelly Close and others. Based on my familiarity with the University properties and my review of the project documents, I am thoroughly familiar with the issues at hand.

3. The three project areas are within the University's lands in the East Bay hills. The areas are made up of a mosaic of native and non-native trees, shrubs and grasses that has evolved over the past 150 years to be a complex ecosystem with great plant and animal diversity. From a fire management perspective this area is considered a wildland according to the National Wildfire Coordinating Group. (http://www.nwcg.gov/glossary/a-z#letter_w). Portions of the areas include a Wildland Urban Interface.

4. As an expert in fire risk mitigation I analyzed these areas and the University's vegetation management proposals in light of fire risk mitigation efficacy.

5. In order to understand how the University's vegetation management projects would affect the risk of a disastrous wildfire, it is important to understand some of the basics of fire science.

6. First, moisture content and its impact on the flammability of vegetation is a key determinant in assessing fire risk. Every living tree, regardless of species, offers important functions to prevent or retard wildland fires that smaller forms of vegetation cannot provide. "The moisture content

of any fuel will determine how easily that fuel will ignite and burn." (https://www.nifc.gov/prevEdu/comm_guide/ch2.html). Trees hold a substantial amount of water and for all intents and purposes are small water reservoirs. (https://web.extension.illinois.edu/askextension/thisQuestion.cfm?ThreadID=19549&catID=192&AskSiteID=87). The San Diego Wildfires Education Project states. "Live trees usually contain a great deal of moisture while dead logs contain very little. . . . Lighter, thinner fuels such as grasses, leaves and needles quickly lose moisture and therefore burn rapidly." (https://interwork.sdsu.edu/fire/resources/fire-burns.htm).

7. Trees also collect on their leaves moisture from the air and drip this moisture on the grasses, brush or shrubs beneath the tree. During a recent site visit I conducted on September 1, 2016, I took several photos illustrating the role moisture in the air plays in the East Bay Hills environment. Attached as Exhibit A is a photo I took depicting a typical foggy morning in an area adjacent to the Claremont Canyon project area.

8. Beyond the direct moisture benefits afforded by trees of any species, trees provide shade that prevents or delays the sun from drying out the grasses, shrubs and brush beneath the tree. "Temperature acts upon the spread of wildland fires because the temperature of the fuel affects how quickly or slowly they will reach their ignition point and burn. Because fuels are also heated by solar radiation, fires in the shade will not burn as quickly as those in the direct path of sunlight." (Website of the National Interagency Fire Center, chapter 2. "Wildland Fire Overview, page 2. https://www.nifc.gov/prevEdu/comm_guide/ch2.html).

9. There is an inverse proportional relationship between the amount of tree canopy and the lowering of the probability of ignition of surface fuels, *i.e.*, the more tree canopy the less chance of a wildland fire occurring. This relationship is profound and basic to wildland fire prevention.

10. "The probability of ignition is strongly related to fine fuel moisture content, air temperature, the amount of shading of surface fuels, and the occurrence of an ignition source (human or lighting caused). Dense stands (canopy cover) tend to provide more shading of fuels, keeping relative humidity higher and air and fuel temperature lower than in more open stands. Thus, dense stands tend to maintain higher surface fuel moisture contents compared to more open stands. More open stands also tend to allow higher wind speeds that tend to dry fuels compared to dense stands. These factors may increase probability of ignition in some open canopy stands compared to dense canopy stands." R. Graham, S. McCaffrey and T. Jain. "Science Basis for Changing Forest Structure to Modify Wildfire Behavior and Severity," U.S. Dept. of Agriculture Forest Service, April 2004.

11. Trees act as windbreaks to retard the spread of a grass, brush or shrub fire should one occur. (AMSET Document. Comments prepared by U.S. Forest Service, Adaptive Management Services Enterprise Team following review of issues related to East Bay Hills Hazardous Fire Risk Reduction DEIS. Opinion document of September 27, 2013. Lozeau Declaration, Ex. A, Bates Pages 000123-126.) The moisture-related benefits of trees described above also are discussed at length in the AMSET Document. (*Id*.)

12. The shading and wind-break benefits of trees is substantial in mitigating the risk of wildfire per the Fire Protection Handbook. "The shade and protection afforded by timber stands influence fuel ratings due to favorable conditions that are created. In a dense forest, ground fuels are protected from the sun and wind. Temperatures and velocities are lower so that moisture does not evaporate as readily from the dead fuels situated beneath dense timber canopies…."

13. This is also why the 1991 Mayors' Firestorm Task Force Report states, "The current emphasis on the Blue Gum Eucalyptus and Monterey Pine as primary culprits in the cause of the recent fire and calls for quick removal of them are an oversimplification that can lead to negative environmental consequences. Particular tree species do not pose a significant danger when properly maintained. The most important factor in reducing fire danger from vegetation is not removing specific species but regular ongoing maintenance." (City of Oakland Task Force on Emergency Preparedness and Community Restoration 1992-02-03. Final Report, page 31). A true and correct copy of the Task Force Report is attached as Exhibit B to this declaration.

14. "Two conditions of fuel moisture have major influence on the rating of fuel types. One concerns the greenness, or curing stage, of vegetation. The other relates to the shade and protection furnished by green timber. . . Fires spread only at a low rate, or not at all in grasses that are green, but when the same grass has become cured and dry, fires will race through them at an extremely rapid rate." (Fire Protection Handbook, 20th ed., 2008. Published by the National Fire Protection Association. Vol. II, page 13-63).

15. Beyond the question of moisture content and the generalized benefits of large trees, the idea of managing fuels by cutting trees (and in particular large trees) is called into question by experts in the field. "While fuel is a key ingredient for any blaze, and fuel accumulations can exacerbate fire intensity, most large blazes result from drought and wind - not fuels. Yet, because fuel treatments are emphasized in management prescriptions, the general public is led to believe that fuels are the driving force in large blazes and by inference, that fuel reduction by tree thinning will prevent large fires." (George Wuerther, ed. Wildfire: A Century of Failed Forest Policy, 2006, page xiii).

16. "If too much wood was in the forests, it seemed intuitive, to some people, that cutting down trees must help the situation. Many pointed to the massive fires in the 1990's as evidence that not enough logging was going on. Yet, throughout the 20th century large fires had followed." (David Carle. Burning Questions: Americas' Fight With Nature's Fire. Greenwood Publishing. 2002, page 252).

17. Based on David Carle's work it is clear that the Black Saturday Fires in Australia, which began on February 7, 2009, followed the pattern of logging leading to a large fire. Logging, which removed moisture collecting trees from the terrain, had replaced forests with grasses and chaparral. The resultant fire burned one million one hundred thousand acres. The August 3, 2014, issue of the Melbourne Herald Sun reported, "Professor David Lindenmayer, Australia's leading scientist of forest ecology said, 'Our findings show the severity of the fires on Black Saturday was significantly higher in the areas that had been logged.' The scientists say the study showed conclusively that logging prior to Black Saturday made the deadly blaze much more extreme."

18. The University proposes to focus their wildfire risk mitigation projects on removing three species of tall trees in the Hill Campus: Monterey Pines, Eucalyptus and Acacia. Although no replanting is proposed as part of the project, there is a stated assumption that once these trees are gone the area will become an oak/bay woodland with native grasses and native shrubs. The University asserts that this resulting ecosystem will be more fire safe than the current ecosystem.

19. There are several problems with this proposal. First, there is no question from a professional fire science perspective that Blue Gum Eucalyptus, Monterey Pines and Acacia are far preferable to a landscape dominated with grasses, and brush/chaparral. Not only are the species that might replace the targeted trees more easily ignitable, those new species burn quickly and erratically, and have a much higher fine fuel content than targeted trees. (https://www.nifc.gov/prevEdu/comm_guide/ch2.html). Additionally, average flame lengths of the replacement vegetation are significantly higher than those of the targeted vegetation. The following table from the Hills Emergency Forum illustrates the comparative flame lengths for the various species of vegetation under discussion:

Species	Flame Length Range, ft.	Median Flame Length, ft.
Eucalyptus	6-21	14
Monterey Pine	2-16	9
Acacia	Not stated	---
Mixed hardwoods (incl. oak and bay)	1-34	18
Brush	14-69	41
Grasses	12-38	25

Source: http://www.hillsemergencyforum.org/MgmtRecmdtn.html

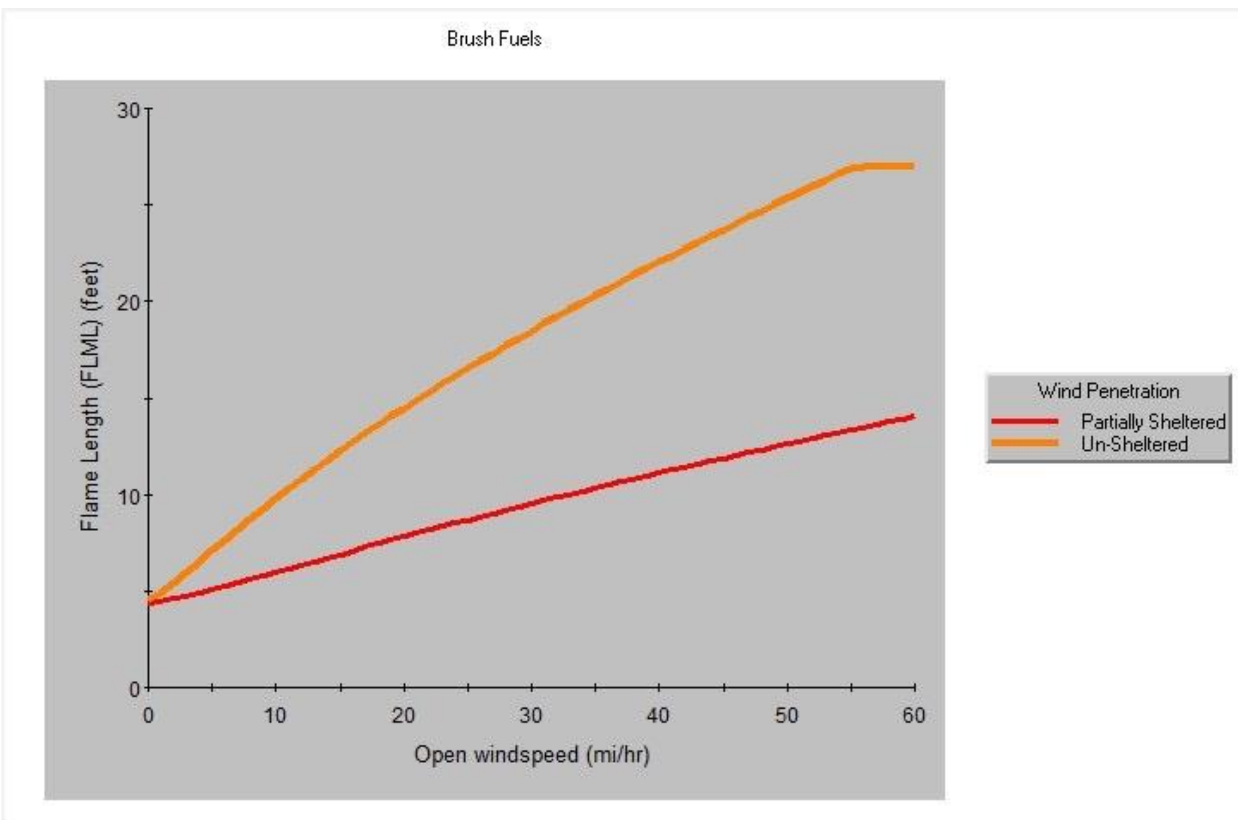
20. In fact, in reviewing the aftermath of a roadside-originated fire in a eucalyptus forest on Grizzly Peak Blvd. on June 30 of this year, what was seen is exactly the same result that happened in the much larger Broadway Terrace fire of June 2007. Both of these fires were set by humans near roadways. Both of these fires started with the ignition of understory fuels and burned with great intensity. In both cases, however, the eucalyptus overstory did not ignite. I visited the site of the recent Grizzly Peak fire. Although signs of the fire are still apparent on the ground, I did not observe any significant fire damage to the eucalyptus trees.

21. The elimination of shade canopy is a serious fire risk concern as this canopy offers a number of significant benefits from a wildfire risk perspective. First, the shade itself is helpful as the resulting lack of sunlight inhibits the growth of ground fuels, and ground fuels are the biggest wildfire risk component. Second, the ground under these trees is substantially cooler and moister than the same land without the tall tree canopy. (AMSET Document. Lozeau Declaration, Ex. A, Bates Pages 000123-126.) Third, tall trees inhibit the spread of fire, inhibiting the horizontal spread of fire during a wildfire. From a fire science perspective tall trees act as a windbreak. Not only do they have high water content, but their sheer bulk makes them relatively difficult to ignite, and they break up potentially dangerous wind patterns that are a big problem for firefighters in a wildfire. (AMSET Document. Lozeau Declaration, Ex. A, Bates Pages 000123-126.)

22. In short, the University's project proposal simply doesn't make sense from a fire risk mitigation perspective. As a retired professional firefighter who fought over 300 fires, whose focus was to save lives and property, I am certain that the present shaded understory environment is far preferable to the proposed oak, bay, grass, and shrub environment.

23. In its AMSET document, the U. S. Forest Service is clear in concurring with this assessment. "Removal of the eucalyptus overstory would reduce the amount of shading on surface fuels, increase the wind speeds to the forest floor, reduce the relative humidity at the forest floor, increase the fuel temperature, and reduce fuel moisture. These factors may increase the probability of ignition over current conditions.

24. The AMSET document also expresses concerns regarding the loss of existing wind breaks: "Furthermore, complete removal of the eucalyptus overstory would result in increases in wind speed which result in a more severe range of fire behavior effects as previously mentioned above. The following illustration is an example of predicted or anticipated flame length for a partially sheltered and an unsheltered brush fuel model to illustrate lower wind speeds for a thinned stand versus higher wind speeds found with complete removal of eucalyptus trees." (AMSET Document (Lozeau Declaration, Ex. A, Bates Pages 000123-126.) The AMSET document presents the following illustrative graph:



25. While there may be reasons unrelated to fire risk mitigation for replacing non-native (or semi-native) species with species that existed here 200 years ago, this is not a fire risk mitigation

strategy. It is in fact a strategy that will significantly increase the risk of and severity of wildland fires in this area.

26. It is my expert opinion that a far more effective approach to reducing fire risk in the East Bay Hills is aggressive, species-neutral vegetation management focused on removing surface fuels, fire ladder components, tree limbs less than 8 feet off the ground, and trees with a diameter at breast height ("DBH") of less than 6" adjacent. These fuel removal and thinning activities should be focused initially on those parts of the project areas within five hundred feet from roadsides and structures. This approach would leave mature, healthy trees greater than 6" DBH standing and continuing their fire reduction benefits which will be enhanced when coupled with this surface and ladder fuel removal.

27. The benefits to this approach are significant. This approach would be far more effective in reducing wildfire risk than the University proposal due to the elimination of ignitable fuels adjacent to roadsides and structures (which the University proposal does not do). Additionally, the remote possibility of a large tree crown fire would be effectively mitigated by the aggressive management of surface fuels and fire ladder components. Again, the University proposal simply ignores this important consideration, instead increasing the amount of easily ignitable and highly flammable surface fuels. Finally, the benefits of maintaining tall trees for their ability to prevent the growth of undesirable surface fuels and to provide shade-cooling, fog drip, water storage and windbreaks cannot be overstated.

28. Given the remaining time left in this year's fire season, there is only so much vegetation management the University can perform between now and February 2017. By focusing on removing surface and ladder fuels near roads and structures over the next few months, the University would actually achieve far more fire risk reduction than if it proceeds with large-scale removals of eucalyptus, Monterey pines and acacias.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct. Executed at WALNUT Creek, California on September 15, 2016.

David Maloney

David Maloney

EXHIBIT A

EXHIBIT B

Task Force

On

Emergency Preparedness
&
Community Restoration

Final Report

Elihu M. Harris
Mayor of Oakland

Loni Hancock
Mayor of Berkeley

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February 3, 1992

TASK FORCE ON EMERGENCY PREPAREDNESS AND COMMUNITY RESTORATION

MEMBERS

Elihu Harris	Mayor, City of Oakland (Co-Chair)
Loni Hancock	Mayor, City of Berkeley (Co-Chair)
Marge Gibson-Haskell	City Councilmember, City of Oakland
Warren Widener	Alameda County Supervisor
Dick Spees	City Councilmember, City of Oakland
Henry L. Gardner	Oakland City Manager
Michael F. Brown	Berkeley City Manager
Jim Brown	Alameda Building Trades Council
Gay Cobb	Private Industry Council
Admiral Robert Toney	Oakland Chamber of Commerce
Jeffrey Leiter	Business Representative, Berkeley
Ed Blakley	U.C. Berkeley, Dept. of City & Regional Planning
Gary Hambly	Building Industry Association
Maureen O'Neill	Oakland Development Council
Peter Smith	City of Oakland Planning Commission
Bob Harris	Pacific Gas & Electric
Doug Jones	Pacific Bell
Artis Dawson	East Bay Municipal Utility District
Jack Neureuter	Oakland Association of Insurance Agents
Brooke A. Levin	Office of the Mayor, City of Oakland
Constance M. Hosemann	Homeowners Representative, Oakland
Thad Kusmierski	Homeowners Representative, Berkeley
Claude Hutchinson	Civic Bank of Commerce

EXECUTIVE SUMMARY

The Task Force on Emergency Preparedness and Community Restoration, co-chaired by Berkeley Mayor Loni Hancock and Oakland Mayor Elihu Harris, was convened shortly after the October 20th firestorm to develop recommendations to help both communities facilitate restoration of the affected neighborhoods, mitigate against future fire hazards, and improve emergency preparedness and response. Over the past three months, the Task Force has been examining the lessons learned to improve the ability of both communities and their residents to prepare for, respond to, and recover from a major urban wildland fire.

On November 21, 1991, the Emergency Preparedness Committee of the Task Force, chaired by Oakland City Councilmember Marge Gibson-Haskell and County Supervisor Warren Widener, held a Public Hearing to solicit the concerns, experiences, and ideas of those who had experienced the fire. Over 200 residents attended the meeting signifying a strong desire on the part of the affected community to participate in the development of policy recommendations to prevent future disasters of this magnitude. Residents expressed a willingness to work with the City to mitigate fire hazards in the area, improve emergency response and recovery, and prepare for a swift rebuilding of the destroyed neighborhoods.

To facilitate the work of the Task Force and include citizen input in the policy-making process, six committees were established to develop policy recommendations in the following areas:

Emergency Preparedness: Marge Gibson Haskell (Co-Chair)
Warren Widener (Co-Chair)

Issues: emergency service plans and coordination; preventive actions; citizen training; warning and alert systems; animal care and rescue.

Communications: Constance Hosemann (Chair)
Jeff Leiter (Co-Chair)

Issues: citizen training; emergency response systems; providing information to residents and the media; emergency operations plans.

Forestry and Vegetation: Ed Blakely (Chair)
Elan Shapiro (Co-Chair)

Issues: vegetation management; plant selection and design; watershed, open space, and land management; assessment district.

Infrastructure and Development: Bob Harris (Chair)
Dick Spees (Co-Chair)

Issues: undergrounding utilities; street widening and evacuation planning; traffic management; water supply; employment and contract opportunities.

Planning, Zoning and Design: Peter Smith (Chair)
Fred Collignon (Co-Chair)

Issues: zoning regulations and permit process; design guidelines and review process; secondary units; architectural diversity; neighborhood participation; safety standards; parking requirements;

Each of the six committees was comprised of Task Force members, experts with specialized technical, legal, and administrative backgrounds, interested citizens, and residents of the fire area (a list of participants is included in the Appendix). City staff attended the meetings to update participants on current City policies and programs. Since early December 1991, each committee has met on a weekly basis and the Committee reports included in this document summarize the broad range of issues discussed and the major policy recommendations developed.

Although each committee met separately, many issues were discussed by more than one group since it is difficult to separate emergency planning, response, and recovery efforts. Throughout the process, several key concerns were emphasized including the need for increased citizen training in emergency preparedness and response; the need to upgrade firefighting equipment to improve response; the need to mitigate against future fires in the Hills; and the need to expedite the rebuilding process to the greatest extent possible. The Committees also recommend the use of a Citywide General Obligation Bond and assessment districts in the Oakland and Berkeley Hills to fund necessary improvements.

COMMITTEE RECOMMENDATIONS

Each committee has prepared a detailed summary of their findings, discussions, and policy recommendations which is included in the body of this report. The following list highlights some of the key recommendations covered therein:

EMERGENCY PREPAREDNESS

A. Incident Command System (ICS):

- Increase the regularity of ICS use to increase familiarity with the system.
- Expand the practice of ICS to include regular use by all levels of City and County government.
- Increase the number of ICS drills.

B. Planning for Infrastructure:

- Tailor C.O.R.E. (Citizens of Oakland Respond to Emergencies) evacuation planning to a street and neighborhood level.
- Expand CORE evacuation planning to account for the needs of bilingual and handicapped populations, as well as the needs of those temporarily disabled by illness or injury.
- Expand CORE training and informational efforts.
- Coordinate CORE training with PTAs, church groups, Phoenix associations, and other community groups.

C. Public Hearing:

- Convene a Public Hearing to receive valuable information about their experiences from homeowners and other participants in the October 20th fire.

D. Aerial Support:

- Encourage parallel structure familiarity between local military commanders and Police and Fire chiefs.

- Formalize the emergency response roles of military personnel with regard to utilization of military aircraft for firefighting.

- Determine the availability of private vendors as well as County and State resources to provide on-call emergency aerial support.

E. Terrain Familiarity:

- Expand the information on the Oakland Hills fire hazard area that is currently on file in the Geographic Information System (GIS) of the California Department of Forestry.

- Expand firefighter training programs to include operation of the GIS system.

- Encourage or require homeowners to improve the visibility of house number identification.

- Increase the number of multi-jurisdictional drills.

- Encourage mutual aid agreements between neighboring jurisdictions.

- Equip fire hydrants with 2.5-inch adapters.

F. Volunteers:

- Provide options regarding appropriate levels of volunteer participation.

- In Berkeley, establish a volunteer disaster council.

- Encourage fire departments to develop procedures for using volunteers in emergency response.

G. Early Warning Systems:

- Fund installation of a system to integrate Cities into state Office of Emergency Services satellite communications system.

- Request that the state Legislature establish the East Bay urban-wildland interface as a special study zone.

- Establish critical weather conditions for initiating emergency response procedures.

- Develop a localized system for citizen reporting of severe weather conditions.

H. Funding:

- Develop a special assessment district for fire prevention activities in the East Bay Hills.

- Investigate the Fire District Consolidation Study to determine the best form of an assessment district for unincorporated areas.

- Establish a Joint Powers Agency to manage the special assessment district and request funding from the FEMA Hazard Mitigation Program.

I. Animal Care and Rescue:

- Develop a plan to address preparedness, response, and recovery activities pertaining to animal/pet care and rescue.

- Standardize pet information forms for lost and found pet information.

- Develop and maintain a database of volunteers interested in animal care and rescue.

- Allow residents needing temporary shelter to bring pets to shelters for first few hours after an emergency.

COMMUNICATIONS:

A. Citizen Training:

- Encourage and facilitate citizen training in emergency preparedness and fire prevention.

- Distribute information about city services, hazard mitigation, and emergency preparedness procedures to all citizens.

- Develop neighborhood evacuation maps and procedures.

- Educate Hill area residents on the value and necessity of vegetation management and brush removal.

B. Emergency Management Structure/Plans:

- Establish an appointed Emergency Management Board or Commission to help coordinate emergency preparedness activities and projects.
- Empower the Office of Emergency Services with lead responsibility for emergency information during and after an emergency.
- Update, implement and maintain existing Emergency Preparedness Plans including the Public Information Operations Manual.
- Establish a new position (or assign tasks) of "Neighborhood Liaison Officer to maintain neighborhood emergency preparedness plans and communications networks.

C. Improved Communications Systems:

- Complete the installation of Oakland's new 800 MHz Trunk System.
- Create a protocol to adequately train staff for "911" emergency dispatch operations.
- Investigate the use of computerized automatic telephone dialing systems to aid in alerting and warning.
- Establish an operational Emergency Incident Command Center.
- Establish an annual Emergency Preparedness Drill.
- Periodically test all communications equipment, plans, and procedures.

D. Providing Information to the Media and the Public:

- Neighboring cities should deploy compatible technologies in order to collect all information in an organized and useful fashion.
- Trained Public Information officers should be available at the emergency command centers and be prepared to talk with residents and the media.
- The media should have access to emergency sites in order to accurately provide information to the general public.

FORESTRY AND VEGETATION

A. Immediate Erosion Control:

- Minimize tree removal, grading, and debris removal in areas of significant erosion or landslide potential until the end of the rainy season (mid-April).

- Reinstate a simplified Tree Removal Permit process (no fee, 10 day processing period, no appeals) in the fire damaged area and inform insurance companies that deadlines for tree and debris removal in areas of landslide and erosion potential must wait until mid-April.

- Make detailed slope stability maps showing areas of high erosion and landslide potential available to the general public.

- Minimize the use of loose hay on slopes with extensive storm drain systems; avoid using jute or other netting on slopes containing unstable soils; avoid clearing or removing vegetation from stream corridors until after the rainy season.

B. Public Education:

- Implement a long-term public information program on vegetation management; immediately form a multi-disciplinary task force to develop this program.

- Develop a Design Handbook tailored to the East Bay Hills which outlines landscape design and vegetative management guidelines.

- Encourage homeowners associations to be involved in setting and maintaining vegetation management standards; support such organizations with enabling policy and technical assistance.

C. Vegetative Management Planning:

- Develop a coordinated vegetation management plan which includes design and maintenance standards for the entire fire hazard area; immediately form a technical advisory committee to develop this plan.

- For Urban Neighborhoods:

  *Develop maintenance standards which mandate the regular mulching or composting of dead vegetative matter on the ground and in trees and shrubs; provide regular debris chipping and brush removal services.

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*Do not target particular species such as Blue Gum Eucalyptus or Monterey Pine for eradication or exemption from tree regulation policies, but require regular maintenance to reduce fire hazard.

- For Public Wildlands:

  *Create and maintain fuelbreaks on wildlands along the urban-wildland interface to reduce the potential spread of wildfires.

  *Use broad area treatments such as prescribed burning to reduce the buildup of surface fuels and undergrowth.

  *Create a Joint Powers Agreement between East Bay jurisdictions to coordinate fuel management activities.

  *Require a Special Fire Assessment District to periodically monitor public wildlands to insure that effective maintenance is employed.

D. Environmental Regulation and Enforcement:

- Establish a Special Fire Assessment District to promote fire safety and fund vegetation management plan enforcement activities.
- Centralize responsibility for vegetative management plan administration and enforcement in a single department.
- Improve regulation and enforcement of vegetative management plans; require annual inspections of all properties in fire hazard areas to insure compliance.
- Implement codes to require landscape and maintenance plans as part of the building permit process.
- Require fire hazard inspections of all properties City-wide at the time of sale to insure compliance with fire safety codes.

INFRASTRUCTURE AND DEVELOPMENT

A. Street Widening and Evacuation Planning:

- Identify a minimum unobstructed street width for evacuation routes, emergency response routes, and residential streets. Implement through parking restrictions or street widening.

- Identify designated evacuation routes and emergency response routes through appropriate signage.

- Notify homeowners of decisions regarding parking restrictions and potential street widening projects.

- Conduct further analysis of the Fire Hazard Area to determine where special evacuation problems may lie.

B. Undergrounding of Utilities:

- Mandate that all homeowners underground the service laterals.

- Identify available funding sources to underground all utilities on the public right-of-way throughout the fire-damaged area.

- Work with PG&E to investigate the possibility of installing automatic gas valve shut-offs.

C. Water Supply:

- In cooperation with EBMUD, work to implement a modern firefighting strategy. Conduct a study to analyze fire flows; water pressure; the need for additional hydrants; reservoir capacity; and the need for backup power for pumps.

- Identify alternative sources of water for firefighting activities.

- Investigate use of above ground portable water delivery systems.

- Study the possible retrofit of hydrants with universal hose couplings.

D. Building Codes:

- Upgrade the current Building Code requirements for roofing materials, siding materials, and projections to prevent the spread of any future fires.

- Require Class A roofs for any re-roofing project in the designated Fire Hazard Area.

- Recommend the installation of sprinklers in extreme fire hazard areas in the Oakland Hills.

E. <u>Employment Opportunities</u>:

- Work with the Chamber of Commerce and the Private Industry Council to identify employment and business opportunities for Oakland residents and businesses as a result of the rebuilding effort.

- Work with the Private Industry Council and the Oakland Development Council to target training programs to the building trades.

PLANNING, ZONING AND DESIGN

A. <u>Neighborhood Involvement</u>:

- Design guidelines for individual neighborhoods should be developed.

- Neighborhood associations should be encouraged to develop voluntary architectural standards and design guidelines.

- All Homeowners' Associations within the fire area should receive copies of the "Applications on File" at the Community Restoration Development Center.

- Implement notice requirements for all applications for use permits and variances.

- Develop a process for conflict resolution.

B. <u>Density</u>:

- Develop mechanisms to help retain the existing density in neighborhoods.

- Illegal secondary units should not be automatically legalized.

- Develop new parking solutions to help alleviate parking problems associated with secondary units.

- Establish guidelines for the residential use of trailers and mobile homes during reconstruction.

C. Lot Coverage:

- Investigate the use of a Floor Area Ratio (F.A.R.) to limit the size of "new" structures.

D. Setbacks/Slope/Coverage:

- Conduct further analysis regarding zero lot lines.
- Encourage diversity in roof designs.
- Reduce the bulk of upslope lots at the front setback.
- Encourage diverse front setbacks.

E. Parking:

- Encourage homeowners to include additional on-site parking to alleviate problems that will be created by new parking restrictions in their neighborhoods.
- Conduct a comprehensive parking analysis for streets in the fire area.
- Investigate tandem parking for areas with steep lots and limited parking.

F. Construction Phase:

- Develop a plan to coordinate construction activities.

G. Additional Resources:

- Create a model of the entire fire area to demonstrate the design and progress of housing development.

H. Permit Processing:

- Exempt homeowners seeking to rebuild the "same size" structure from design review.
- Ensure that permits will be processed expeditiously.

- In developing a new permitting process, do not differentiate between current owners and new residents.

- Permit applications for Hiller Highlands and the Parkwoods Apartments should be subject to existing regulations for design review, environmental review, and planning.

CONCLUSION:

On February 5, 1991, the Task Force on Emergency Planning and Community Restoration will present its final recommendations to a joint working session of the Oakland and Berkeley City Councils. These citizen recommendations will serve to inform the Council-members as they debate policy issues relative to the immediate reconstruction of the fire area and as they deliberate long-range planning solutions to the problems identified by the Task Force. Following this presentation, City staff will respond to each of the recommendations and provide a written report for City Council review in early March.

This report of the Task Force on Emergency Preparedness and Community Restoration is a reflection of the hard work, energy, and dedication of a broad cross-section of our community in response to an unprecedented planning challenge. Over 150 participants, some of whom lost their homes in the October 20th fire, have made an important contribution to the difficult decision-making process which confronts both Berkeley and Oakland as the Cities work to reconstruct the damaged neighborhoods, mitigate against future wildland fires, and improve emergency response systems. Once again, this process of community participation has confirmed that the Cities of Oakland and Berkeley must draw upon the special resources and creative energy of their citizenry to rebuild, restore, and plan for the future.

FORESTRY AND VEGETATION COMMITTEE

I. Introduction

Overview

Graphic television images of exploding Monterey pines and reports of fast flying eucalyptus debris during the recent catastrophic fire have focused public debate on the role of vegetation in spreading fire.

The purpose of this report is to identify how vegetation actually contributed to the recent fire, and to make recommendations to the Oakland and Berkeley City Councils about specific steps that should be taken to reduce the danger from fire and and to insure the long term viability of the hills environment.

Fires in this area are inevitable. The challenge is to minimize damage as much as possible. In the Committee's view little progress has been made in managing fire because of a lack of understanding about wildfire; lack of coordination and planning to reduce the danger of wildfire; and lack of enforcement to insure that measures recommended to reduce fire danger are actually implemented.

To address these needs it is recommended that the City Councils focus on three items:

(1) Education,
(2) Planning, and
(3) Regulation.

Significant changes in standard operating procedures will be required to lessen risk from fire, drought, and erosion, and maintain a healthy environment, but without these changes we are increasing our vulnerability to natural forces. Regional and local cooperation is essential for success, and both Councils are urged to take the lead in this regional effort.

6

Primary Findings

All of the following factors are critical to consider when examining the role of vegetation in fire:

- The most important factor in reducing fire danger from vegetation is not removing specific species, but **regular on-going maintenance.**

- The **high density of flammable structures** contributed significantly to the spread and intensity of the Oakland hills fire. **Trees did play a role in** spreading the fire, but in many cases the trees caught fire from the houses, not vice versa.

- **Design** is very important; all plants can be rendered more or less flammable, depending on how far apart they are spaced, arranged, kept clear of structures, and irrigated.

- The current emphasis on Blue gum (*Eucalyptus globulus*) and Monterey pine (*Pinus radiata*) as primary culprits in the recent fire, and calls for quick removal of them, are an oversimplification that can lead to negative environmental consequences. Species selection can be important in reducing fire danger, but should not be overstressed.

Finally, the committee found that surface and gully erosion is currently taking place within the burned area, as well as in the rest of the hills. The potential for future erosion and landslides is significant, despite remedial actions taken to date. The committee made several recommendations regarding improvements to the post fire response effort which should be acted upon **immediately**.

Primary Policy Recommendations

- **Implement a long term far-reaching public education program** on vegetation management that is targeted to a wide range of audiences.

- **Develop a coordinated vegetation management plan** for the entire fire hazard area (public and private lands) that addresses safety, beauty and environmental protection.

- **Improve regulation and enforcement of design and maintenance standards.** Design and maintenance standards developed in the vegetation management plan should be enforced by specific City ordinances and regulations. These regulations should be easily understood, and compliance encouraged and enforced in a variety of ways.

- **Immediately minimize tree removal, grading, and debris removal** in areas of significant erosion or landslide potential until the end of the rainy season. Reinstate a simplified tree removal permit process and inform insurance companies that deadlines for tree and debris removal in areas of landslide potential must wait until mid-April.

Immediate Implementation Recommendations

- **Form a multi-discipline action group** with education, communication and technical expertise to immediately develop a detailed public education plan.
- **Create a technical advisory committee** of representatives of public agencies, professionals, and homeowners to develop a vegetation management plan, and design and maintenance standards that can be easily understood.
- In accord with existing government codes, **establish a Special Fire Assessment District** to promote fire safety and environmental maintenance, and help fund the extra services required in this higher risk environment.

The Committee's recommendations represent an essentially unanimous opinion of the Committee. Participants included experienced fire ecologists, firefighters, foresters, arborists, landscape architects, park naturalists, geologists, writers, editors, and homeowners. A complete list of Committee members is included in the report.

These findings and recommendations are based on the empirical observations of Committee members, extensive research, information from other California municipalities that have survived major fires, and the experience of homeowners and others before, during, and after the fire. The Committee also worked with the American Society of Landscape Architects Fire Task Force and other relevant groups.

II. Vegetation Management

Selecting, designing and maintaining plants is an important responsibility of all homeowners and public agencies. In the past, this responsibility has been largely unregulated, with little educational information or support provided to landowners. Given the important role vegetation plays in the safety and enjoyment of residents, this is clearly an opportune time to begin making vegetation an important priority.

It is essential to link efforts to reduce fire danger with other environmental considerations, including water conservation, erosion control, slope stability, wildlife habitat, recreation, and solid waste management. Without this linkage, some recommendations to reduce fire danger could exacerbate water supply problems, increase the risk of erosion and landslides, add waste disposal problems and eliminate wildlife habitat. It is also important to consider financial impacts and implementation requirements when evaluating potential actions. Solutions to fire management must take into account all these variables.

It is also important to distinguish between individual lot landowners in urbanized areas, and large, institutional landowners of open space and wildlands. Each of the several zones in the hills (urban, wildlands, and urban/wildland mix) have different conditions and require different management techniques. The recommendations in this report recognize the critical differences between zones and separate them where appropriate.

The following findings and recommendations are organized by topic:

A. Education

The single most effective way to achieve greater compliance with appropriate landscaping and vegetation management is education. Education and public outreach programs must be developed if cities in the East Bay are to meet their mandate to provide for public safety and environmental protection.

Findings

- Education is necessary to modify both public perception and behavior related to urban/wildland fire hazards and vegetative management practices.
- Individual homeowners and the general public have an important role to play in reducing fire hazards. Even if unlimited personnel and funds were available, public agencies and city governments cannot address these problems alone.

- Several groups are currently providing some public education and technical information, but the effort is not coordinated. No central clearinghouse is readily available to the public to coordinate activities and disseminate technical support.

- There are several successful public education programs on other environmental issues that can serve as role models for the development of a comprehensive fire/vegetation program (e.g. EBMUD's water conservation, the CORE earthquake preparedness program).

Policy Recommendations

- Implement a long term far-reaching public education program. The program should:

  - Provide information to a wide range of audiences (homeowners, nurseries, landscape contractors, allied professionals and public agencies.)

  - Use a variety of methods including:
    - written materials (*Design Handbook*, pamphlets, lists etc.)
    - demonstration projects
    - clean-up campaigns
    - design video
    - local radio, TV (e.g. KTOP) and newspaper media
    - educational/interpretive programs

  - Cover the full range of relevant topics, including post-fire recovery, emergency planning and procedures, hazards evaluation, management considerations (such as water conservation, erosion control, freeze resistance, deer resistance), maintenance standards and methods, and landscape design.

- Encourage existing related public education programs to incorporate fire hazard reduction information. Support the programs and efforts of other public agencies.

- Support homeowner associations, neighborhood and grassroots education efforts by providing both enabling policy and technical assistance. Recognize the success of several homeowner association programs, for example projects sponsored by the Phoenix group, and other neighbor based projects such as Crimewatch.

- Encourage homeowner associations to be involved in setting and maintaining standards for vegetation. Provide incentives for common ownership of and responsibility for individual lots of open space in neighborhoods.

Implementation Recommendations

- Form a multi-disciplinary action group with education, communication and technical expertise to immediately develop a detailed public education plan. The plan would outline programs and implementation strategies, and capture the momentum of existing emergency response efforts (such as the Ad hoc Council on Replanting Needs (ACORN); individual volunteers, homeowner groups, local professional organizations and public agencies).

- Assemble a team of experts to develop a *Design Handbook* that would outline landscape design and vegetation management guidelines relevant to different property conditions and plant types specific to the hills. The handbook should be easy to understand and use, and include lists of more or less fire prone plants, along with information about the arrangement and maintenance of plants and their critical role in reducing fire risk. The list should include guidelines for the effective maintenance of different plant species, as well as the role of plants in water conservation, wildlife habitat and slope stability.

- Identify a central location and staff to act as a clearinghouse and to pro-actively distribute information and facilitate local groups' education efforts. Consider the use of the University of California Cooperative Extension for this purpose.

- Actively pursue existing funding sources to develop the education program. Consider sources such as the California Department of Forestry Forest Stewardship Program; local corporations or manufacturers of related products; state and national environmental associations; state level Consumer Affairs Boards; and professional organizations.

- Solicit the local scientific community, industries and professionals to develop and contribute information on reducing fire danger. Encourage their participation in education programs at local nurseries, extension offices, garden clubs etc, where the general public often obtains landscape related information.

B. Planning

Thoughtful, informed planning is essential to unite the numerous public agencies and private landowners in a coordinated effort to reduce fire danger. A comprehensive vegetation management plan will provide the structure and direction for regulations that all can agree to implement.

Policy Recommendations

- Develop a clearly illustrated vegetation management plan for all developed and undeveloped land, based on scientific principles and accepted wildfire management practices. The plan should:

  - Consider overall environmental impacts (such as water conservation, air quality, erosion control and landslide prevention, seismic safety, and preservation of plant and wildlife species diversity). Adhere to the California Environmental Quality Act (CEQA) environmental review process;

  - Develop design and maintenance standards that allow for maximum diversity and personal expression in landscape materials and design. A high level of flexibility and sensitivity must be built into the review and enforcement process.

  - Include maps of the developed and undeveloped lands in the hazard zone.

  - Consider creation of fire management zones similar to those developed in other areas of California.

  - Recognize the need for site specific recommendations that take into account specific conditions and landowner needs.

Because the conditions and ownership patterns between urban neighborhoods and public wildlands differs so markedly, additional recommendations and findings for each area have been separated in this section.

Urban Neighborhoods

Findings

- There are a wide variety of landscape designs through which homeowners can create beauty, serenity, privacy and neighborhood character, and at the same time reduce the potential for damaging fire, and be ecologically responsible.

- Some plants are more fire prone than others; however the arrangement and maintenance of plants is a more critical factor in determining fire hazard than are specific species.

- Plant selection and design should take into consideration site specific factors, such as property size, slope, aspect (which way the slope faces), soil and water conditions, and the arrangement of structures.

- The danger of fires spotting between wildlands and urban areas can be reduced through the use of fire resistant building materials---especially roofs. Shake or shingle roofs are not only easily ignited by windblown firebrands, but they produce large numbers of firebrands themselves as a structure burns. These firebrands in turn start other fires.

Policy Recommendations

- Develop maintenance standards to be followed by all public agencies and private property owners in designated fire areas. These standards should require shrubbery and fast growing grasses to be regularly cleaned of dead matter, and trees to have dead matter and fuel ladders (undergrowth and lower branches) removed as appropriate. The standards should educate landowners about how to remove dead matter, and how to use debris in mulching, and composting.

- Encourage moisture and water retention in landscaping through drip irrigation systems, mulching, gray water systems, and cisterns for storing rain water. Emphasize mulch and compost as means of increasing soil fertility and water retention, and to protect the watershed and preserve water quality.

- Do not target specific species, such as Blue gum eucalyptus, or Monterey pine, for eradication or exemption from tree regulation policies. Existing stands of pine and eucalyptus must be regularly maintained, and debris processed to substantially reduce susceptibility to fire. Rapid conversion of these stands could cause negative ecological impacts, such as significant soil erosion and possible landslides, and be very costly. Substitute ~~trees should~~ only be phased in gradually if appropriate and cost effective.

- Encourage appropriate species selection with respect to reducing fire danger in replanting and reforestation in the fire burn area.

Implementation Recommendations:

- Create a technical advisory committee to develop a regional vegetation management plan based on sound practices and principles, and to define design and maintenance standards. The committee should also develop short and long range plans to minimize future erosion and landslide problems.

- Rescind Berkeley's eucalyptus eradication policy. This policy is contrary to sound fire prevention practices and could be very costly and environmentally detrimental. It also misleads the public about effective vegetation management for fire protection.

- Improve overall cooperation between the cities and the scientific community. Minimize reliance on a few consultants, and broaden the base of advice on key decisions.

- Provide regular brush removal as well as mulching/composting services to encourage residents to maintain vegetation.

Public Wildlands

Several of the recommendations listed above, such as developing a comprehensive vegetation management plan, apply to public wildlands as well as urban neighborhoods. In addition, there are findings and recommendations specific to public wildlands in the East Bay hills:

Findings

- Numerous variables in fuel, weather and terrain all interact to contribute to the rate of spread and intensity of a wildfire.

- Vegetation management to reduce wildfire danger focuses on reducing *available* fuel. Fuels which are fine, dry, continuous (but not compacted) and plentiful are most available to a wildland fire and contribute to its spread and intensity.

- Wildland fires can endanger urban areas in two ways: rapidly spreading, intense flame fronts, and/or firebrands blown ahead of the main fire that start fires. This is called 'spotting.' In urban/wildland mix areas much spotting is caused by burning materials from structures.

- Fuelbreaks (low available fuel buffer strips) and fire breaks (no fuel strips) help control the spread of flame fronts, but are often ineffective in that fire can "jump" these breaks.

- Particular tree species do not pose a significant fire danger when properly maintained. The selection, arrangement and maintenance of vegetation around a structure to reduce available fuel is also important in reducing the danger of spot fires.

- Some stands and species of trees in the fire area have created litter and not been adequately maintained to insure fire safety. A greater effort by public and private property owners is needed and should be encouraged.

- Broad area treatments, such as prescribed burning, are effective in reducing the build-up of surface and ladder fuels in wildlands. The periodic reduction of these fuels greatly reduces the chance that a wildland fire will become intense enough to burn the crowns of trees and cause long distance spotting.

Recommendations

- Evaluate and implement fuel management alternatives based on effectiveness in reducing fire danger, and on environmental impacts, financial costs, and implementation requirements.

- Create fuel breaks on undeveloped land along the urban-wildland interface to reduce the spread of fire, and to serve as a base against which to anchor other broad area treatments; with the understanding however, that fuel breaks can be almost completely ineffective in extreme fire conditions.

- Use broad area treatments such as prescribed burning to reduce the build-up of surface fuels and undergrowth.

- Create a Joint Powers agreement to coordinate fuel management objectives and treatments between the numerous jurisdictions that have authority over public wildlands.

- Require either the Cities or the Fire Assessment District to periodically monitor wildland areas to insure that effective maintenance is carried out.

C. Regulations

Education and planning are effective ways to encourage compliance with landscape and vegetation guidelines, but regulations and enforcement are still needed to insure actual change. There are existing laws that can be adapted or augmented to increase fire prevention and protection activities. The committee is recommending additional ordinances and code changes in order to maintain an environment that reduces fire hazards on both private and public properties. This can only be accomplished through a combination of incentives and penalties with active enforcement and education.

Findings

- Currently, neither Oakland or Berkeley has a regular program that promotes or enforces fire safety practices.

- Existing codes that might be used to regulate vegetation are inadequate and insufficiently enforced. (For example, P.R.C. Section 4291 has apparently not been adopted by the cities, and therefore is not City policy.)

Recommendations

- Investigate the North Oakland Hills Area Specific Plan Zone S-11 (site development and landscaping) regulations as a possible model ordinance for the entire Oakland/Berkeley fire hazard area.
- Designate a lead department in each City to be responsible for all enforcement mechanisms relating to vegetation management.
- Implement city codes that would require all homeowners to submit a landscape plan and ongoing maintenance plan as part of the building permit process. Insure that the code is easy to understand, supported by clear educational materials, and that review and approval is done by qualified experts in a 'user friendly' process.
- Require annual inspections of all property in fire hazard areas to insure compliance with vegetation management codes. Inspections would be based on specific site conditions, design and maintenance standards developed in the vegetation management plan, and would be clearly defined.
- Require a reasonable area, adequate to the site, around each home or structure to have plants that are selected, arranged, and maintained to minimize fire hazard, as well as take into consideration other environmental factors such as water conservation, wildlife habitat, slope stability and plant diversity. Emphasize that this does not necessarily mean a loss of privacy and aesthetics, but can be achieved in a way that preserves beauty, privacy and variety. Those homeowners wishing to retain more vegetation close to their homes must assume a higher level of maintenance to reduce fire hazard. (Information about how to landscape in this way would be available in the *Design Handbook*, which should be readily available to all homeowners.)
- Develop a mandatory home inspection program (city wide) at the time of sale to insure that the home and associated environment meets city fire safety codes. The cost of these inspections would be borne by the home seller and must be completed by authorized fire safety professionals or fire department officials prior to the close of escrow (similar to termite inspections.)
- Establish a Fire Prevention Assessment District that covers the entire East Bay hills from Richmond to San Leandro. This recognizes the fact that fire is a regional problem and must be addressed on a regional scale. Present a plan for implementation of the Assessment District and real estate transfer tax plan (see the Funding section) using joint powers agreements.

- Use the Assessment District to stimulate the formation of community based associations that could serve as vehicles for implementing many of the above policies. This approach would place more responsibility on homeowners, encourage community cohesiveness and reduce costs. It might have the additional effect of reducing crime and promoting community harmony.

- Investigate the use of positive incentives to encourage compliance, such as using funds from the Fire Prevention District and/or the real estate transfer tax to advertise applicable insurance discounts for maintaining fire safe environments; and developing a program of community group (block) rebates from the Fire Assessment District for maintaining community fire safe areas. These rebates could be used for additional fire protection or community improvement activities or received by individual homeowners, depending on the decision of the group.

- Initiate a periodic, independent review of the performance of the Fire Prevention Assessment District.

D. Funding

Recognizing the fact that cities and public agencies have tight budgets and little discretionary resources for devoting to these recommendations, we strongly recommend the use of self-financing implementation methods, and creative applications to other funding sources. Time prevented development of this area, but we strongly encourage additional research to be done.

Findings

- Financial costs - both short term and long term - can vary considerably between fuel management techniques. For example, the prescribed burning every five years of accumulated surface fuels under a large grove of eucalypts is far more cost effective than converting and maintaining the area as native grassland or native trees.

Recommendations

- Make use of assessable liens for non-compliance with fire codes.

- Investigate the possibility of an addition to the real estate transfer tax dedicated to fire prevention education. The funds from this tax would be made available in part to community based associations to develop volunteer training programs in fire prevention, landscape design and maintenance, enforcement of fuel buildups and fire watch programs.

- Pursue joint applications from the Cities of Oakland and Berkeley for the State of California Department of Forestry Stewardship program grants.
- Investigate grants and other funding sources to support the development of a comprehensive vegetation management plan for the East Bay hills.

III. Immediate Erosion Control

The committee reviewed the actions taken by the Cities of Berkeley and Oakland after the fire to reduce soil erosion and the danger of landslides. We also reviewed policies relating to the removal of vegetation from burned lots, and determined the following:

Findings

- Erosion (surface and gully) is occurring, and landslides are apparent in the fire-damaged area, despite preventative measures taken to date.
- The potential for further erosion and landslide activation is significant. Landslide potential is greatest in areas exhibiting previous slope instability, steep slopes, and in areas that may receive uncontrolled runoff. In areas where trees or deep rooting brush have been killed and removed, landslide potential may increase in future years.
- Further assessment and action is required to minimize further erosion and landslide activation.
- Some post-fire, surface erosion control measures that have been applied to the hills are inappropriate in this urban landscape.
- Many storm drains throughout the Berkeley and Oakland hills are antiquated, or in such poor condition that they are creating erosion problems or exacerbating existing landslides.

Policy and Implementation Recommendations

- Minimize excessive soil and site disturbances **in areas of significant erosion or landslide potential** until the end of the rainy season (mid April). This includes tree removal, grading, and debris removal.

- Re-regulate tree removals using a simplified, no-cost, ten day Tree Removal Permit process. Eucalyptus should not be exempt during the rainy season as they can increase slope stability by removing soil water and can increase soil strength by the effect of their roots.

The majority of committee members felt that eucalyptus should not be exempt from the Tree Preservation Ordinance even after April 15. However, there were two members that felt strongly eucalyptus should be exempt from the Tree ordinance as is currently the case.

- Work immediately with insurance companies to assure that they understand why tree removals should be delayed until the end of the rainy season. This action is intended to minimize homeowner costs.

- Make slope stability maps available for public use at City offices. Use the media to inform people about availability of the maps.

- Implement the following recommendations related to soil erosion:
  Avoid spreading loose hay for soil erosion on hillslopes with extensive storm drain systems. This causes a maintenance problem as hay will clog the inlets.

  In landslide areas, do not apply jute and/or other types of erosion control netting or hay bales, each of which can increase the amount of water into the unstable soils.

  Avoid clearing or removing vegetation along stream corridors, particularly riparian species, for application of erosion control measures, (such as debris racks and erosion control netting) until appropriately assessed by an arborist following the end of the rainy season.

Other erosion control measures

- Develop procedures for mulching and hydro seeding that allow for maximum germination using agreed upon ecological principles. Analyze what caused difficulties in germination of the seeding of the hills after this last fire.

- Maintain and monitor storm drains during and following storm events. Correct problems that are observed.

- Develop a long-term solution to fixing, modifying or replacing storm drains at the source of where they have created erosion or exacerbated slope stability problems (rather than applying short term remedial actions to gullies created by storm drains).

- Based upon the new geotechnical mapping prepared by city consultants, property owners should be notified when public lands that are in a natural condition could potentially be affected by land failure and impact private property. This notification is in accord with Government Code 831.25.

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EXHIBIT D

Hazardous Tree Reduction Draft Environmental Impact Statement (DEIS)

East Bay Hills, CA

Fire Behavior Commentary; June 17, 2013

Kelly Close, Fire Behavior Analyst
Fire Progression, LLC

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I. SUMMARY

I was asked to evaluate the Hazardous Tree Reduction Draft Environmental Impact Statement (herein referred to as "the DEIS") and provide feedback regarding fire behavior and fuel treatment options. This feedback includes assessment of the fire behavior modeling in the FEMA proposal, the alternatives considered, the efficacy of the proposed alternative selected, and the potential fire behavior and landscape impacts post-treatment.

I have reviewed all available components of the East Bay Hills DEIS for Hazardous Fire Risk Reduction and the East Bay Regional Park District (EBRPD) Wildfire Hazard Reduction and Resource Management Plan (WHRRMP). The discussion that follows also includes other reference material pertaining to fuels and fire behavior. These are cited in the References section (Appendix B).

Opinions and conclusions included in this document are based on the above sources of information, standard accepted fire behavior modeling methodology and procedures, and professional experience and observations.

II. SCOPE AND SPECIFIC ISSUES

Scope

This report focuses on the proposed fuel treatments described in the 2013 East Bay Hills Hazardous Fire Risk Reduction Draft EIS. A synopsis of the specific issues to be addressed in Section IV is provided below.

Specific Issues to be Addressed:

Detrimental effect of the proposed fuel treatments in the DEIS on wildfire hazard mitigation.

The immediate effect of the proposed fuel treatments will be to reduce the potential for torching, crown fire, and spotting. However, the proposed treatments will also increase the surface fuel loading substantially by converting non-fuels (standing trees) into surface fuels (lop-and-scatter treatment of branches). In the absence of any continued long-term maintenance beyond what is specified in the DEIS, it is my opinion that this change in fire hazard is temporary, valid only for a short period of time post-treatment, and trades one problem for another.

Removing all eucalyptus, Monterey pine, and acacia trees will be a severe site disturbance. Such catastrophic site disturbances that include extensive canopy removal do not favor the less invasive native species such as oak or bay trees, but rather favor more invasive species. As noted above, this phenomenon has been documented on numerous mechanical fuel treatments in the California Bay Area that are similar to actions proposed in the DEIS. In my opinion, that without further long-term maintenance that includes extensive planting of other species, the proposed actions will not differentially favor native species, but will simply favor invasive, highly flammable brush species, both native and non-native, leading to dangerous, intense, and destructive wildfires. It is further my opinion that the actions proposed in the DEIS will lead to dangerous, intense and destructive wildfires. The net effect is essentially trading one fire hazard for another, at a significant dollar cost and detriment to the local ecosystems.

The DEIS states that removal of the tree canopy would increase the amount of rainfall that reaches the ground, rather than being intercepted by trees, and also acknowledges that precipitation reaching the ground by fog drip during the summer months, up to 10 inches annually, would be reduced or eliminated. The DEIS does not acknowledge the critical impact the reduced precipitation from fog drip would have on fire danger and the greater potential for catastrophic fires due to reduced summer precipitation. This is a serious omission that incorrectly downplays the impact of tree canopy removal.

Effect of depositing up to 24 inches of eucalyptus mulch on the ground surface.

The DEIS justifies depositing up to 24 inches of mulch, primarily from eucalyptus trees, on the ground surface based on research involving decomposition and fire hazard posed by no more than 6 inches of mulch. It fails to acknowledge research that highlights the high potential for spontaneous combustion in deeper accumulations of mulch, the difficulty of fire suppression in such fuels, the severe long-term damage to soils by the intense heating in mulch and wood chip fires, and the documented spotting danger posed by mulch and other forms of masticated fuels. In my opinion, deposition of this much woody material on the surface of the ground in any form does not follow sound fire management practices and has the net effect of increasing surface fuel loads.

Issues with fire behavior modeling conducted for the DEIS.

Fire behavior modeling conducted for the DEIS (FlamMap) included an assessment of the no-treatment alternative and the chosen, aggressive treatment alternative involving removal of all eucalyptus, Monterey pine and acacia trees. No modeling was done to assess the effectiveness of any alternative, less aggressive strategy – the Combined Alternative Program (DEIS, 3.3.1.4) in particular – nor any longer-term post-treatment fire hazard conditions. FlamMap has powerful features that facilitate determining the optimum fuel treatment strategy, and timing of treatments, for an area. Contrary to this, the FlamMap modeling in the DEIS was done *after* the chosen alternative was designed and selected.

Additionally, none of the fire behavior modeling in the DEIS addressed the Vesta model developed by Australian researchers specifically for use in eucalyptus fuel types. This is a serious oversight considering the majority of the proposed hazard reduction work involves eucalyptus.

In my opinion, FlamMap was used in the DEIS simply to justify the chosen alternative, not to compare alternative strategies and determine the optimum fuel treatment strategy.

Further, FEMA could not, or would not, provide the data used for fire behavior modeling. This made independent assessment of alternative strategies, and comparison of those to the “no-Treatment” option and the chosen option, impossible.

Failure of the proposed action to meet all mandatory FEMA criteria.

The proposed action fails to meet all of the mandatory criteria as specified by FEMA’s Hazard Mitigation Program grant programs (DEIS, Section 2.2). In particular, for reasons described further in this document, it is my opinion they do not meet specific requirements for long-term effectiveness in reducing wildfire risk.

Viability and feasibility of an alternative hazard mitigation strategy.

The EBRPD fuel treatments for many polygons, planned and supported in part by the FEMA grant, use a less aggressive approach than the chosen fuel treatment strategies of the UC Berkeley or City of Oakland, and are similar to the Combined Alternative Program rejected in the DEIS. The proposed EBRPD treatments cost approximately $4,444/acre compared to over twice that cost per acre for the proposed UC treatments, and over three times that for the Oakland treatments. Given that, and the numerous detrimental factors of the proposed actions (UC-Oakland) in the DEIS, it is my opinion that the Combined Alternative Program approach is clearly a preferable alternative to the actions proposed by the UC and City of Oakland. It meets all FEMA’s mandatory criteria, accomplishes FEMA’s stated hazard reduction objectives, follows sound forestry practices, does not result in an increase in invasive brush species post-treatment, deposits far less flammable woody material on the treatment sites, and is more economically sound.

III. INTRODUCTION

Terminology

For the purpose of the discussion to follow, clarification of some basic fire behavior terminology is provided below. Fire behavior terminology was adapted from NWCG, 2012. Fuel treatment descriptions were from Section 3 of the DEIS.

Fire Behavior Terminology

Fire Behavior - The manner in which a fire reacts to the influences of fuel, weather, and topography. Fire behavior is further described by the following types of fire propagation:

> *Ground Fire* – Fire that consumes the organic material beneath the surface litter ground, such as a peat fire. Spread is primarily by smoldering combustion with low spread rates.
>
> *Surface Fire* – Fire that burns loose debris on the surface, which includes dead branches, leaves, and low vegetation.
>
> *Torching* – The burning of the foliage of a single tree or a small group of trees, from the bottom up.
>
> *Crown Fire* – A fire that advances from top to top of trees or tall shrubs more or less independent of a surface fire. Crown fires are sometimes classed as running or dependent to distinguish the degree of independence from the surface fire. Dependent crown fires are by far the most common form of crown fire, as the conditions required to sustain a crown fire independent of a supporting surface fire are very unusual.
>
> *Spotting* – Behavior of fire producing sparks or embers that are carried by the wind and which start new fires beyond the zone of direct ignition by the main fire.

Crown Base Height – The vertical distance from the ground surface to the lowest available crown fuels.

Fireline Intensity – The product of the available heat of combustion per unit of ground and the rate of spread of the fire, interpreted as the heat released per unit of time for each unit length of fire edge. The primary unit is Btu per second per foot (Btu/sec/ft) of fire front.

Flame Length – The distance between the flame tip and the midpoint of the flame depth at the base of the flame (generally the ground surface), an indicator of fire intensity.

Fuel Model – Simulated fuel complex for which all fuel descriptors required for the solution of a mathematical rate of spread model have been specified.

Rate of Spread – The relative activity of a fire in extending its horizontal dimensions. It is expressed as rate of increase of the total perimeter of the fire, as rate of forward spread of the fire front, or as rate of increase in area, depending on the intended use of the information.

Wildland/Urban Interface (WUI) – The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.

Fuel treatment terminology and descriptions

Canopy removal – The removal of all large trees to greatly reduce or eliminate overstory (crown) fuels.

Limbing – The removal of all branches of a tree to a specified height for the purpose of eliminating vertical fuel continuity (ladder fuels) and reducing or eliminating the risk of torching or crown fire.

Thinning – Selective removal of a portion of the trees, often favoring the removal of smaller trees, to create a more open stand of larger trees and reduce horizontal continuity of crown fuels.

Proposed Actions – For the purpose of this document, this term describes the proposed actions in the DEIS wherein eucalyptus, Monterey pine and acacia trees would be eliminated from treatment areas. Woody debris from removed trees up to 24 inches dbh would be mulched and spread over 20% the ground surface to a depth of up to 24 inches. Trees larger than 24 inches dbh would be cut to 20-30 foot lengths and left intact on the site as woody debris. Branches of trees larger than 24 inches would be lopped and scattered on the site. The stated objective is to leave all downed material on site (DEIS, 3.4.2).

Combined Alternative Program – The hazard fuel treatment method referenced in 3.3.1 of the DEIS, which includes: removal of brush and surface fuels; removal of lower tree limbs; species-neutral removal of small trees and understory trees to remove ladder fuels, increase tree spacing and maintain shade to suppress brush and grass; removal of eucalyptus debris that falls off trees after a freeze; keeping grass short by mowing or grazing. This treatment methodology is sometimes referred to as the “Selective Thinning Alternative” (Lozeau, 2013, pers. comm.).

Hazard Mitigation and Fuel Management

The primary purpose of hazard fuel treatments in WUI areas is to change the potential fire behavior in a way that lessens the destructiveness of wildfires and provides less dangerous working conditions for firefighters. A basic tenet of wildland fuel management is to use various tools, models and data to determine the optimum treatment type and frequency, given site conditions, desired post-treatment conditions, and economic and other constraints. Fuel treatment can consist of mechanical treatment, prescribed fire, herbicide application, or a combination of these.

Wildland Fire Behavior Modeling

In Rothermel (1972) described a means of modeling wildland surface fire spread and intensity through a set of mathematical equations and quantitative, stylized fuel models.

This system became known as BEHAVE (Rothermel, 1981) and has been a central component in fire behavior modeling for the past several decades. Like any model, BEHAVE has its inherent assumptions and limitations, and is intended as simply an approximation of real-world fire behavior that must be validated by observation and experience (Stratton, 2006). BEHAVE is a deterministic model, consisting of numerical inputs and outputs, and for many years was primarily a tabular model.

In 2007, Australian researchers produced a system, known as Vesta, which was developed specifically for assessing fire behavior in eucalyptus fuel types (Gould et al., 2007). Vesta was developed based on extensive field research in which 104 fires were set in eucalyptus forests to study fire behavior under an array of variables.

Vesta determines a separate hazard rating for surface and near-surface fuels and bark fuels. It then determines the rate of spread based on surface and near-surface fuel characteristics, and fuel moisture. Rate of spread and firebrand production are directly related to surface and near-surface fuels, as well as bark fuels. Finally, the surface fuel hazard rating is combined with the bark hazard rating and wind speed to determine the spotting potential. Vesta's real strength is that it is the only fire behavior prediction system that is specific to eucalyptus fuel types.

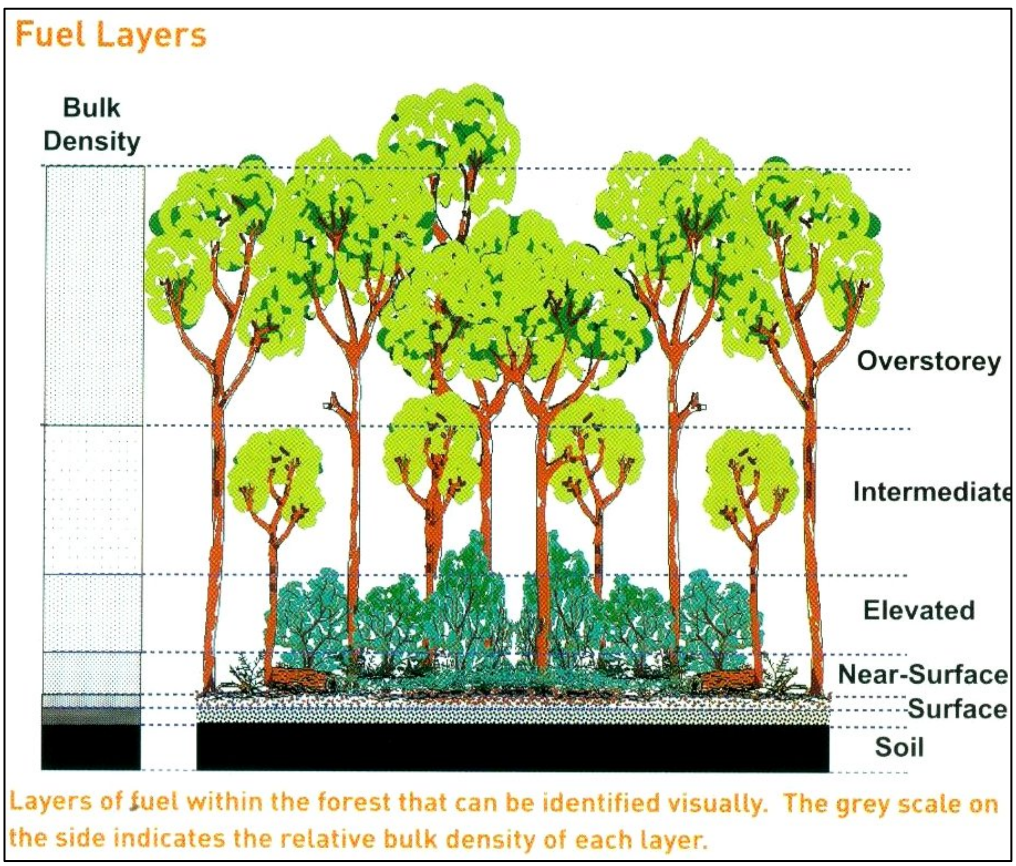

Figure 1. Fuel Layers in eucalyptus forests. From Vesta, 2008.

Spatial Wildland Fire Analysis and Modeling

The growth in the prevalence of geographic information systems (GIS) and associated data enabled the development of spatially-based fire growth models that simulated fire spread and fire behavior across a landscape. Unlike BEHAVE, these spatially-based models consider all the various combinations of inputs at each point in a digital landscape in assessing fire growth and behavior. The two prevalent spatially-based fire modeling systems are FARSITE, which simulates fire growth in a temporally and spatially variable environment, and FlamMap, which displays potential fire behavior across an entire landscape for a given set of spatially-variable inputs. Both FARSITE and FlamMap also have the capability to produce a variety of tabular and graphical outputs as well.

FARSITE and FlamMap are not models per se, but rather a system of models that provides a variety of types of outputs. Each incorporates BEHAVE for surface fire modeling, along with several other fire behavior and fuel moisture models to enable assessment of crown fire and spotting, and fuel treatment planning (Rothermel, 1991; Van Wagner, 1993; Albini, 1981; Stratton, 2006).

Critical Thresholds for Initiation of Crown Fire

Crown fire has two stages of development. The first is initiation wherein surface fire spreads into tree canopies (crowns) via vertical ladder fuels. This is commonly known as torching. The second phase is propagation of fire through the crown fuels. This requires critical measures of wind, slope, or both to occur (Van Wagner, 1977 and 1993).

There are three critical thresholds that must be met for crown fire to occur. First, there is a critical minimum surface fireline intensity needed to initiate crown fire for a given crown base height. This critical threshold increases exponentially with increasing crown base height (Fieldhouse, 2003). Second, continued propagation of a crown fire front typically is dependent on surface fire. Third, there is a critical threshold of crown spacing for a given wind speed. Above this critical crown spacing, propagation of a crown fire front will not occur (Schaaf et al., 2007).

Fuel Treatment Planning - FlamMap

FlamMap allows the user to display potential fire behavior in a spatially variable environment, and provides useful tools for planning fuel treatments. FlamMap allows the user to quantify the impacts of varied landscape-level fuels treatments (Finney, 2006). FlamMap also enables the user to compare the effect of different fuel treatments on potential fire behavior (hazard), and FlamMap's Treatment Optimization Model helps determine the optimum fuel treatment objective, and treatment timings, to minimize fire spread in a given project area (USDA Forest Service, 2012).

In addition to FlamMap, other companion tools area available – the Forest Vegetation Simulator and its Fire and Fuels Extension (FVS-FFE) provides a means of visualizing proposed fuel treatments. Another tool, MAGIS helps assess operational constraints related to maintenance of treatments. A project currently nearing completion, OptFuels, incorporates fire modeling capabilities of FlamMap, vegetation simulation capabilities of FVS-FFE, and land management components of MAGIS into a comprehensive tool for fuel treatment planning and management (Jones and Chung, 2011).

IV. DISCUSSION OF SPECIFIC ISSUES IN THE DEIS

Detrimental effect of the proposed fuel treatments in the DEIS on wildfire hazard mitigation.

High-disturbance impact of the proposed fuel treatments

The immediate effect of the proposed fuel treatments will be to reduce the potential for torching, crown fire, and spotting. However, this is only a temporary reduction in fire hazard. Removing all eucalyptus, Monterey pine, and acacia trees will be a severe site disturbance. Such catastrophic site disturbances do not differentially favor less invasive native species, but rather favor more invasive species (Kerns, 2005; Owen, 2010). Martinson et al. (2008) pointed out that common hazard reduction treatments involving mechanical thinning or prescribed fire often result in the invasion of non-native species.

Further, the proposed treatments would convert non-fuels (standing trees) into available surface and ground fuels though a combination of mulching woody material and lop-and-scatter treatment of branches. This introduces a very significant amount of fuel onto the ground surface that was not there pre-treatment and creates a new fire hazard posed by the heavy accumulation of wood chips and other woody debris that was not present precviously.

In other fuel treatments in the Bay Area similar to the proposed actions, canopy removal in similar vegetation types in fact encouraged rapid invasion of the treated sites by aggressive exotic species such as English ivy, acacia, *vinca* sp., French broom, and Himalayan blackberry (URS, 2009). The National Park Service (NPS) also states that treating eucalyptus fuels in California necessarily entails continued site maintenance, including planting native species, to avoid site invasion by aggressive non-native species (NPS, 2006).

It is my opinion that, in the absence of any continued long-term maintenance beyond what is specified in the DEIS, the stated reduction in fire hazard is temporary and only valid for a short period of time post-treatment. The proposed actions will cause severe site disturbance that will not differentially favor native species as claimed, but will favor aggressive, invasive non-native species. Without further long-term maintenance that includes fuel reduction and extensive planting, the proposed actions will result in development of brush fields with characteristics much like native chaparral, leading to dangerous, intense, and destructive wildfires. The net effect is essentially trading one fire hazard for another – at a significant economic cost, detriment to the local ecosystems, and endangerment to the public.

Impact of overstory removal on rainfall, fog drip and site conditions

The DEIS (5.6.2.3) states that the amount of precipitation reaching the ground surface will increase after the proposed actions are implemented, largely due to less rainfall being intercepted by tree canopies. This will happen largely in the winter months when rain is most prevalent. The DEIS also states that canopy removal will result in decreased precipitation that reaches the ground during the dry summer months due to drastic reduction or elimination of fog drip. According to the DEIS, precipitation from fog drip is an important source of water in the summer months, producing up to 10 inches of precipitation each year. The DEIS also correctly states that sunlight reaching the ground surface will greatly increase after canopy removal, increasing the peak daytime temperatures.

The DEIS fails to mention that the combination of reduced precipitation and increased temperatures in the summer months will increase fire danger on treated areas. Thus, the fire danger will actually increase after the proposed actions are implemented. This is a serious and critical omission from the DEIS.

It is my opinion that removal of the canopy will result in hotter, drier conditions on treated sites that will support more intense fire spread with flame lengths well in excess of the stated FEMA objective of less than eight feet.

Increased fire intensity in post-treatment vegetation

The stated goal of the DEIS is to reduce wildfire hazard to acceptable levels by converting the current vegetation mix to one comprised largely of oaks, bays, grasses, and chaparral. As pointed out in the URS report (2009), in the absence of any post-treatment re-vegetation plan, all possible vegetation types for the treatment areas need to be considered. These include grasslands, chaparral, shrub/scrub communities, and oak-bay forests.

Per the Hills Emergency Forum, expected flame lengths in plant communities in the area are as follows:

Table 1. Fire hazard associated with six plant communities of the East Bay Hills.

Species	Flame Length Range, ft.	Average Flame Length, ft.
Eucalyptus	6-21	13.5
Monterey Pine	2-16	9
Acacia	Not stated	---
Mixed hardwoods (incl. oak and bay)	1-34	17.5
Brush	14-69	41.5
Grasses	12-38	25

Source: http://www. hillsemergencyforum. org/MgmtRecmdtn. html

The stated acceptable hazard level is defined in the DEIS by surface fires having flame lengths of no more than eight feet. However, the vegetation that the DEIS states will result from the proposed actions would result in median flame lengths that are significantly greater than 8 feet, and maximum flame lengths many times the stated DEIS objective of eight feet. Clearly, if the objective is to reduce the average flame length to less than 8 feet, the proposed actions fail to accomplish this goal and in fact have the net effect of increasing the long-term wildfire hazard in treated areas.

Variance of proposed actions from standard hazard reduction practices in eucalyptus vegetation types

In Australia, where eucalyptus forests are widespread and comprise much of the native vegetation, hazard reduction treatments do not entail total canopy removal. Rather, the typical treatment is reduction of surface fuels, usually by prescribed fire (Bradstock et al. 2012). In eucalyptus forests, the greatest hazards are intense surface fires and long-range spotting from bark. Reducing surface fuels has been found to be greatly successful in reducing these hazards, as well as minimizing the potential for crown fire.

Further, it has been found that eucalyptus trees actually help *reduce* fire hazard by breaking up turbulent flow dynamics of strong winds and reduce the hazard from flying embers. “Clear cutting gum barks reduces safety from firestorms, both along the Urban Wildland Interface as well as internal defensible space areas where they assist with high-risk ground fuel mitigation” (Lofft, 2010). For this reason, taller eucalyptus trees such as blue gum are now used for wind and fire protection in many locations.

The DEIS cites no evidence to support the contention that tree thinning and surface fuels management is not a viable alternative to the proposed actions, and in fact acknowledges that thinning and removal of understory fuels is an acceptable approach to fire hazard mitigation (DEIS, Section 3.3.1). The approach of thinning and surface fuel treatment, outlined in the DEIS under the Alternative Treatment Program, has been used successfully by the EBMUD in adjacent properties for years, and has been increasingly favored by EBRPD as well. Further, The DEIS completely ignores widely accepted hazard reduction practices in eucalyptus forests of Australia.

In my opinion, the DEIS fails to justify the proposed actions as a better option than one based on thinning and surface fuel reduction. Moreover, the proposed actions in the DEIS completely ignore, and deviate substantially from, widely accepted hazard reduction practices in eucalyptus and would actually *increase* the fire hazard in the long-term.

Effect of depositing up to 24 inches of eucalyptus mulch on the ground surface.

Effects of mulch on remaining vegetation

The DEIS justifies depositing up to 24 inches of mulch and wood chips on the ground surface based on research involving decomposition and fire hazard posed by no more than 6 inches of mulch. It fails to acknowledge the detrimental effect a 24-inch depth of mulch will have on the remaining vegetation. Appleton and French (1995) recommended no more than 2-3” depth of mulch in landscaping to minimize detrimental effects on the remaining trees. 24 inches is far in excess of this. In contrast, the DEIS claims that the mulch generated by the proposed actions will actually preferentially favor native plant growth, yet fails to provide any scientific evidence of this. The research publications cited in the DEIS describe depths of no more than 12. 5 cm (5 inches).

Fire hazard posed by wood chips

Wood chips and mulch pose a significant fire hazard in and of themselves. The Ohio Dublin Villager noted that mulch fires are common in landscaping (2013), and mulch fires can pose a serious risk of devastating fires (Escobar, 2013). As previously pointed out by the URS Corporation in their report to FEMA (2009), "Studies have shown that mulch layers actually can pose a fire risk depending upon the type of material, the depth of the mulch, and the climate at the mulch site.” Studies have demonstrated that ignition by cigarettes or matches can result in a subsurface smoldering fire in a variety of mulch materials 4 inches deep (Steward et al. 2003).

Deep accumulations of mulch are also highly susceptible to spontaneous combustion. Fire Engineering describes the potential for catastrophic fires posed by spontaneous ignition in mulch piles (Finucane, 2008). This same article also noted the greater ignition potential of mulches high in oil. When a pile of wood chips spontaneously ignited in Everett, WA, the pile continued to smolder for months and workers battled flare-ups 24 hours a day (Chircop, 2013). In Phoenix, AZ, smoke from a mulch fire burning for an extended period of time caused health concerns to the point that a nearby high school was forced to relocate classes (Bierman and Stout, 2013). Fires that ignite through spontaneous combustion or by other means of ignition may smolder and spread beneath the surface for days before being detected, making suppression of those fires extremely difficult and time-consuming.

With hot, dry weather and strong winds, mulch fires – particularly those not yet detected – pose a serious threat to surrounding wildlands. In 2012, the Lower North Fork Fire in Colorado originated from a prescribed burn of masticated fuels (essentially a coarse mulch) varying from 3-6" in depth. In subsequent days of patrol and mop-up, the burn appeared to be cold and dead. The fourth day post-burn, a strong, dry wind caused these "cold" fuels to begin actively burning again, resulting in an catastrophic escaped wildfire that destroyed 23 homes and killed three people (Bass, 2012).

Given the warmer, drier conditions on the treated sites after canopy removal, the high oil and volatile chemical content of eucalyptus fuels, and the frequent occurrence of strong winds in the proposed treatment areas, it is my opinion the deposition of eucalyptus mulch outlined in the DEIS will pose a very significant fire hazard for a number of years post-treatment.

Soil damage caused by mulch fires

Another issue with the extensive mulch deposition proposed in the DEIS is the potential for long-term damage to soils by mulch fires. Fires burning as smoldering combustion in mulch fuels expose underlying soils to intense, prolonged heat. This potential for excessive, lethal soil heating is very real and particularly problematic when soils are dry (Busse et al., 2005). Fires in mulch and ground fuels burn slowly and release a significant amount of heat in doing so (Frandsen and Ryan, 1986). Heating of the soil from mulch fires can damage roots of plants on the site (Stephens and Finney, 2001). Smoldering surface combustion causes more long-term damage to the soil itself by killing beneficial microorganisms in the soil and by actually altering the physical characteristics of soil – much like kiln-fired clay. This effectively sterilizes the soil, reduces water infiltration (DeBano, 1999), and leads to excessive runoff and erosion (Hungerford et al., 1991).

The DEIS fails to address the very real risk of permanent soil damage and other deleterious effects on vegetation posed by smoldering mulch fires. This risk is exacerbated even further by the warmer, drier conditions expected with canopy removal and the high oil and volatile chemical content of eucalyptus mulch.

Failure of the proposed action to meet all mandatory FEMA criteria.

The proposed action fails to meet all of the mandatory criteria as specified by FEMA's Hazard Mitigation Program grant programs (DEIS, Section 2. 2). In particular, the proposed actions are a one-time treatment, with follow-up actions limited to herbicide application to reduce eucalyptus stump sprouting. Nowhere does the DEIS address longer-term (5-10 years or more) maintenance to keep the fire hazard from increasing due to invasion by native and non-native brush species. Two of the specific criteria which are not met by the proposed actions:

> "Alternatives to a proposed action must also meet these criteria to be eligible for funding. To be eligible for funding, the proposed action or alternative must:
>
> 3. Be cost effective and able to substantially reduce the risk of future damage, hardship, loss, or suffering resulting from a major disaster, consistent with 44 CFR § 206. 434(c)(5) and related guidance
> 5. Provide for long-term effectiveness and benefits (between 5 and 10 years, depending on the type of action). "

For reasons previously discussed in this report, the proposed actions fail to meet the required criteria specified by FEMA as they relate to reducing future risk and providing for long-term effectiveness. .

Issues with fire behavior modeling conducted for the DEIS.

Fire behavior modeling conducted for the DEIS (FlamMap) included assessments of the no-treatment alternative, the proposed alternative involving removal of all eucalyptus, Monterey pine and acacia trees, and the connected actions of the EBRPD. The fire behavior modeling included in the DEIS is incomplete, vague, and fails to demonstrate the proposed actions are preferable to any alternative action, including the Combined Alternative Program (section 3.3.1.4).

Fire modeling is incomplete

For the proposed treatment areas, no modeling was done to assess the effectiveness of any alternative, less aggressive strategy – the Combined Alternative Program in particular. This treatment alternative was simply dismissed as expensive and difficult without any evidence to support this claim. In fact, the fire modeling Rice conducted for the DEIS (2011) showed that the a number of EBRPD treatments, which are similar to the Combined Alternative Program, are very effective in reducing fire intensity to acceptable levels (flame lengths below 4 feet) and in minimizing or eliminating the potential for torching or crown fire (DEIS, Appendix M-2, pp. 17-39). The DEIS failed to acknowledge this in eliminating the Combined Alternative Program from consideration. This is puzzling in that the DEIS incorporated the EBRPD hazard reduction plan as a viable part of the overall strategy of reducing wildfire hazard in the East Bay Hills, yet the Combined Alternative Program, similar to the proposed actions in many polygons of the EBRPD's plan, was not considered in DEIS.

The modeling of post-treatment conditions presented in the DEIS is invalid because it modeled a state of vegetation and fuels that is irrelevant in the long term. Modeling done for post-treatment conditions shows in many cases that the proposed actions do in fact reduce the fire hazard to acceptable levels as specified in the DEIS. However, these conditions exist only immediately post-treatment. Wildland fuel complexes are inherently dynamic. Several critical factors will change over time that in turn will change the fire hazard, both in nature and degree of severity. The modeling as presented in the DEIS did not assess any potential conditions of the proposed treatment sites 5-10 years in the future, and thus fails to show that one of the key FEMA criteria for funding – long-term effectiveness – will be met. The DEIS clearly states that the intended vegetation mix that will exist upon completion of these projects is an oak, bay, chaparral, and grasses environment, this is the environment that should have been modeled rather than one immediately post-treatment that was only very transitory, and would not exist for more than a few months after the current trees are removed.

Fire and fuels discussion minimizes the hazards inherent in mulch depositions

Further, there was little mention in any of the fire and fuels discussion about the potential and real fire hazard posed by the extensive areas of mulch, up to 24 inches deep. As standing, live trees, eucalyptus trunks and large branches are not available as fuel. However, under the proposed actions, they would be ground up and redistributed onto the ground surface, thereby making them available as fuels. One of the stated objectives of the DEIS is to reduce the fuel load, and this action would actually *increase* fuel loads. The only mention of fire potential in mulch from the proposed actions is limited to one paragraph in section 5.2.1.

Though mulch fires cannot be modeled per se in any of the existing fire modeling systems, the fire modeling and related discussion of fire and fuels in the DEIS did not adequately address the increase in fuel loading due to mulching, the very real potential for mulch fires, nor their potentially deleterious impacts on the treatment sites and surrounding areas. This is a very significant omission in assessing the post-treatment fire hazard and efficacy of the proposed actions.

Vesta model not considered

The Vesta model was developed by Australian researchers specifically for use in eucalyptus fuel types (Gould et al., 2008 and 2009). Unlike the U.S. fire modeling systems (BEHAVE, FlamMap, FARSITE), Vesta addresses the unique characteristics of eucalyptus fuels and provides a system for assessing fire behavior in these fuels.

The fire modeling presented in the DEIS did not include any assessment using Vesta, and did not even mention the existence of Vesta, which has been in use since 2007. While FlamMap can provide a general idea of the spatial distribution of fire behavior, it does not include any fuel models involving eucalyptus fuels. Thus, it must necessarily be used with caution and a great deal of adjustments based on user experience.

There is a definite difference in how Vesta handles spotting and how the U.S. fire modeling system does so. In both cases, there is a rising column of hot air that initially comes from an intense surface fire. Once the base of the tree crown ignites, it adds to the intensity and vertical lift of the firebrand, which eventually is lofted above the tree tops and carried some distance by wind.

In the U.S. system (which FlamMap, BEHAVE and other programs use), the firebrand is generated in the tree canopy low in the crown fuels, then lofted vertically. Surface fuels initiate the process, but most of the fire dynamics happen in the burning tree crown.

In Vesta, the firebrand is generated mostly from surface and near-surface bark fuels, and to a lesser extent by near-surface and elevated fuels (see attached diagram). Spotting is strongly tied to a factoring of surface fire spread rate and wind, which generates the surface fire intensity necessary for vertical rise. However, unlike the U.S. model, the tree canopy does not significantly contribute to firebrand production. Its primary role is in adding to the intensity of the rising column of hot air and keeping the piece(s) of bark burning.

The omission of modeling using Vesta is a serious oversight considering the majority of the proposed hazard reduction work involves eucalyptus. The Vesta model is considered state-of-the-art science in eucalyptus fuel types, and its omission in the DEIS fire modeling calls into question many of the conclusions in the DEIS that are based on fire hazard assessment using only the U.S. models.

Fire modeling was not done to determine the optimum treatment(s)

FlamMap has powerful features that facilitate determining the optimum fuel treatment strategy (Treatment Optimization Model), and timing of treatments, for a given area. Alternative strategies can also be assessed and compared with FlamMap. Other available tools previously mentioned in this report allow for consideration of economic and other constraints in determining optimum fuel treatments. This is a standard approach to fuel management – identifying objectives, and developing treatment strategies to best meet those objectives.

The fire modeling in the DEIS goes counter to this. The FlamMap modeling in the DEIS was done *after* the chosen alternative was designed and selected. No modeling was done to proactively determine the appropriate strategy. In my opinion, FlamMap was used in the DEIS simply to justify the chosen alternative, not to compare alternative strategies and determine the optimum fuel treatment strategy. Had fire modeling with

FlamMap been done to assess alternative treatments, such as the Combined Alternative Program, it would have been clear that the proposed actions are not the only viable fuel reduction actions, and other actions might in fact be more effective and appropriate in meeting the stated goals for hazard reduction.

Fire modeling results are vague and possibly erroneous

The fire modeling outputs from the Anchor Point work are vague and do little to support the proposed actions. In Table 5.2.2 in particular, there are many cases where the fire hazard actually *increases* after treatment. No additional or corrected information was issued following a May 16, 2013 request for clarification of this from Anchor Point (Grassetti, 2013, pers. comm.). Therefore, one can reasonably conclude that the proposed actions will actually increase fire hazard in many cases.

Additionally, no numerical results were provided in Table 5.2.2. Instead, the reader is provided flame length categories with qualitative descriptions (Low, Moderate, High, Extreme) with no explanation of how these categories were defined. Therefore, the reader has no way of knowing what any of these classifications actually mean, making it impossible to properly ascertain whether the project objectives were met.

Given the many, significant shortcomings and omissions in the fire modeling, and subsequent discussion of fire and fuels, the DEIS as a whole should be invalidated. The fire modeling provided in the DEIS is core to the DEIS justifying that the proposed actions will accomplish the objectives of the grant, and it fails to do this.

Inability to conduct additional fire behavior modeling to evaluate alternative treatment strategies not considered by the DEIS

In order to conduct fire behavior modeling for the proposed alternative not chosen, or to determine parameters of other alternative fuel treatment strategies, the same data must be used as was used for the modeling included in the DEIS. FEMA has been unable or unwilling to provide data requested to properly analyze this DEIS. Despite a timely FOIA request, FEMA has failed to provide any of the documents or data that were requested from FEMA. This includes opinion documents from consulting agencies, updated/corrected fire modeling documents, and the electronic files that were used to run the fire modeling simulations.

The methodologies for three different fire modeling reports were described in some detail in the DEIS. However, the time and effort it would take to re-create these data would be prohibitively excessive, given the short period for comment. Thus, it was not possible to examine the chain of facts and logic FEMA used to construct the DEIS, and difficult to validate that FEMA's conclusions were warranted based on the inputs used. That FEMA did not provide the requested data files for fire behavior modeling made independent assessment of alternative strategies, and comparison of those to the “no-Treatment” option and the chosen option, impossible.

In fact, in FOIA documents received in earlier requests, the URS Corporation clearly stated that the UC projects made little sense from a fire risk mitigation perspective, and that the US made assertions that were not supported. In light of this this one document that surfaced, one has to wonder how many others exist came to similar conclusions but were not released.

This in and of itself should invalidate the DEIS as NEPA requires that source documents be made available, but they were not.

Viability and feasibility of alternative hazard mitigation strategies.

Reasonable alternatives to the proposed actions were not considered in the DEIS and received only cursory discussion. No data or analyses were provided to support the dismissal of any of these alternatives. While the DEIS dismisses alternative approaches to the proposed UC methodology (proposed actions), in fact EBRPD and the East Bay Municipal Utility District (EBMUD) are planning on using many of these alternative approaches on their properties. It is puzzling that within the same document an approach is argued to be unfeasible and too expensive yet accepted as feasible and economically viable elsewhere in the same document. If thinning, and ladder fuel removal meet the fire hazard mitigation objectives for one agency, they should also do so for other agencies.

The DEIS dismisses removal of ladder fuels as expensive, and sometimes difficult on steep slopes. There are two issues with this statement. First, the proposed actions involve extensive logging activities on these same slopes. The degree of tree removal proposed on steep slopes would itself have a significant destabilizing effect on soils and itself lead to erosion. Second, no economic analysis was provided as to why removal of ladder fuels would be “expensive” and no comparison of any cost estimates was provided to support these claims.

The URS Corporation (2009) did not agree with FEMA’s assertion that thinning and ladder fuel removal was not a feasible treatment. The 2009 URS report to FEMA stated, "The UC accurately cites increased costs and a longer time period to implement as reasons that this alternative is not preferred, but the UC does not provide information that demonstrates that the increased costs or longer implementation period make this alternative infeasible. This alternative would not be as effective as the proposed project at reducing the fire hazard. However, this alternative would reduce the fire hazard and would thus meet the purpose and need. This alternative should be evaluated in future NEPA documents. "

Ultimately, the stated objective of the DEIS is to reduce fuel loads. In the case of the UC projects, the surface fuels – as well as aerial fuels and woody material – would in fact not be removed, but instead be chipped and scattered on-site. By comparison the Combined Alternative Program approach advocated by HCN would cause these fuels to actually be removed, thereby accomplishing what the DEIS says needs to be done.

V. EFFICACY OF AN ALTERNATIVE STRATEGY

Efficacy of alternative treatments in meeting the hazard reduction goals of the grant

Some of the EBRPD and ongoing EBMUD fuel treatments (proposed and connected treatments) planned and supported in part by the FEMA grant use a less aggressive approach than the proposed actions advocated by the UC and City of Oakland, are similar to the Combined Alternative Program (DEIS, 3.3.1) rejected in the DEIS, and effectively accomplish the stated goals of the FEMA grant.

Economic viability of the Proposed Alternative Treatment

The EBRPD treatments cost approximately $4,444/acre compared to over twice that cost per acre for the proposed UC and City of Oakland treatments, and over three times that for the Oakland treatments:

Table 2. Allocated funding and treatment costs per acre.

Project Area	Actions	Grant Funding, $	Matching Funding, $	Total Funding, $	Treated Acres	Cost per Acre, $
UC Strawberry Canyon	Proposed	450,000	150,000	600,000	56	10,714
UC Claremont Canyon	Proposed	350,000	116,000	366,000	43	10,840
Oakland	Proposed	1,329,018[1]	443,006	1,772,024	121.9	14,536
EBRPD	Proposed[2]	1,800,000	600,000	2,4000,000	540.2	4,444

1. Assuming the same cost per acre for Frowning Ridge as for Strawberry and Claremont, the UC would spend a total of $1,998,000 to treat Frowning Ridge, of which 75%, or $1.498m would come from Oakland. EBRPD is getting paid for treating 51.9 acres for Oakland, which based on an average cost per acre for the rest of the EBRPD projects (540.2 acres/$1.8m equals $3,333/acre + 25% matching, or $4,444/acre). This leaves Oakland with:

$3,000,000 starting
less UC Frowning $1,498,000
less EBRPD 51. 9 $172,982
Net to Oakland is $1,329,018 for 121. 9 acres, plus 25% matching=$1,772,024 total or $14,536/acre

2. EBRPD's vegetation management methods are based on its Wildfire Hazard Reduction and Resource Management Plan (EBRPD 2009) and follow the same treatment methodology as Connecting areas described in the DEIS.

High Fire Hazard: Coyote Brush Scrub

Low Fire Hazard: Coyote Brush Scrub

Figure 2. *Figure V-5* from EBRPD Wildfire Hazard Reduction and Resource Management Plan. These photos demonstrate the reduction in hazardous brush fuels achieved by treatments comparable to the Combined Alternative Strategy**.**

High Fire Hazard: Mature Eucalyptus Forest

Low Fire Hazard: Mature Eucalyptus Forest

Figure 3. *Figure V-9, b* from EBRPD Wildfire Hazard Reduction and Resource Management Plan. These photos demonstrate the reduction in surface fuel continuity and elimination of ladder fuels achieved through treatments comparable to the Combined Alternative Program. For the "Low Fire Hazard" scenario (right), surface fires would be of low intensity and trees would not be susceptible to torching or crowning. Further, reduced eucalyptus bark on the ground surface and lower tree trunks minimizes the risk of spotting.

The Combined Alternative Program is a more effective and more viable treatment methodology than no-action or the proposed actions

The stated goal of the DEIS is to reduce wildfire hazard by treating hazardous fuels. While the proposed actions would reduce the risk of torching, crown fire and spotting immediately post-treatment, this approach would not necessarily reduce the fire hazard in the long term. It would introduce new hazards from increased surface fuel on treatment sites, hotter, drier conditions, and invasion of flammable, aggressive exotics. Even if the vegetation in the treatment areas eventually did revert to a more native state, this does not come without significant fire hazards. As previously discussed, the native plant communities of the East Bay Hills, and of the western U.S. in general, carry significant fire hazards as they are almost universally fire-adapted or fire-dependent. In considering the average flame lengths shown in Table 1 for each of the native and non-native plant communities prevalent in the vicinity, it is clear that even with periodic maintenance, the resultant fire hazard would be well in excess of the stated objective of the DEIS.

In considering all the factors discussed in this report, the Combined Alternative Program is the best alternative for accomplishing that objective. Figure 3 provides a dramatic example of the fuel complex resulting from the Combined Alternative Approach as described in the DEIS. This approach reduces the fire hazard immediately post-treatment, and long-term, by:

- Maintaining the overstory, providing increased precipitation during the dry summer months and reducing understory growth through shading

- Minimizing understory fuels, thereby minimizing surface fire flame lengths to well below four feet and minimizing or eliminating the potential for torching, crown fire and spotting

- Removing ladder fuels, eliminating vertical fuel continuity and minimizing or eliminating the potential for torching, crown fire, and spotting

Recommendation for the Combined Alternative Program approach to fuel treatments

Given the demonstrated effectiveness of treatments similar to the Combined Alternative Program, and the lower cost per acre associated with such treatments, as well as the the numerous detrimental factors of the proposed UC and City of Oakland actions in the DEIS, it is my opinion that the Combined Alternative Program approach is clearly a preferable alternative. It meets all of FEMA's mandatory criteria, follows sound forestry practices, is consistent with current accepted hazard fuel reduction practices for eucalyptus, does not result in an increase in invasive brush species post-treatment, deposits far less flammable woody material on the treatment sites, and is more economically sound.

The Combined Alternative Program approach should be used as the preferred action on all areas to be treated in order to meet the stated objectives of the DEIS in reducing the fire hazard in the East Bay Hills. Additionally, to maintain a lower level of wildfire hazard, periodic maintenance should be performed following the approach of the Combined Alternative Program. This is necessary to prevent accumulation of surface and ladder fuels over time (Agee et al., 1973)

In my opinion, more reasonable and economically responsible alternatives have been dismissed or ignored in this DEIS. Based on the factors discussed in this document, it is my opinion that the DEIS as written is fatally flawed and should be retracted. Until a thorough and balanced assessment of treatment strategies and alternatives can be conducted, no further actions should be pursued beyond the planned actions currently being implemented by the EBRPD.

VI. APPENDICES

Appendix A – References

Appendix B – Professional and Educational Background

Appendix A – References

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Rothermel, R.C. 1983. How to predict the spread and intensity of forest and range fires. Gen. Tech. Rep. INT-143. Ogden, UT: U.S. Department of Agriculture, Forest Service, Intermountain Forest and Range Experiment Station. 161 pp.

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Appendix B – Professional and Educational Background

Expertise

My primary areas of expertise are fire behavior analysis, wildland fire program management, hazardous fuel response and mitigation planning, and wildland fire operations. I have served as Fire Behavior Analyst (FBAN) and Long Term Analyst (LTAN) on numerous large, complex wildland fires. I have extensive experience working on incidents with complex suppression and management strategies, and with a diversity of land management and public safety considerations.

I have 26 years of experience in wildland fire and emergency services with federal, state, and local government fire organizations. This includes a breadth of wildland fire experience ranging from initial attack to support of large, complex fire organizations as an FBAN and LTAN, and prescribed fire and fuels management.

My fire behavior knowledge and expertise includes broad experience in wildland fire investigations, including origin and spread analysis, fire behavior and movement in complex terrain, firefighter burnover investigations, and fire loss litigation cases. I have helped teach a national-level course, Advanced Fire Behavior Interpretation (S-590), for 12 years.

I possess extensive expertise in the use of geographic information systems, analysis of spatial information, and geospatial fire analysis and interpretation. In particular, I have performed numerous complex analyses of fire behavior, potential fire growth, forensic fire behavior analysis, and hazard fuel treatment effectiveness. For this, I made extensive use of tools that include FARSITE (Fire Area Simulator), FlamMap, FireFamily Plus, BEHAVE, FSPro (Fire Spread Probability) and RERAP (Rare Event Risk Analysis Process).

My experience in fire program management includes five years as the Wildland/Urban Interface (WUI) program coordinator for my current employer, and five years as the Rural Fire Coordinator for the state of Montana. In both of these positions, I worked with teams and working groups in hazard mitigation and pre-response planning, and in coordinating response to large, complex WUI wildfire incidents.

Professional Experience

I am currently a Battalion Chief with the Poudre Fire Authority (PFA) in Ft. Collins, CO. In my current role, I oversee the daily operations of a Battalion covering approximately 120 square miles with complex planning and emergency response needs that include structural fire suppression in urban, suburban and rural areas; WUI operations;

whitewater rescue; mountain rescue; and emergency medical response.

Prior to that, I served nine years as a Captain. In that role, I supervised and managed the operations of an emergency response crew, served as the Operations liaison of the WUI Team, manage the department's Wildland Incident Qualification System for 140 personnel, and was part of the core hazmat response and planning team.

For nine years previous to my position as Captain, I served as Firefighter, Driver/Operator, and EMT with the PFA.

From 1990 to 1995, I was the state-wide Rural Fire Coordinator with the Montana Dept. of Natural Resources (DNRC) based in Missoula, Montana. I was the primary liaison between local and county fire organizations and the various state and federal agencies in the state of Montana.

From 1988 to 1990, I was a fuels technician, engine boss, and firefighter with the USFS on the Clearwater National Forest, ID.

From 1987 to 1995, I served as a volunteer firefighter and EMT with the Missoula Rural Fire District in Missoula, MT.

Education

I received a Master of Science degree from the University of Montana, School of Forestry, in 1995. My degree was in Forestry, with emphasis in wildland fire management. Thesis topic: GIS Applications in Wildland/Urban Interface Fire Management and Planning in Missoula County, MT. 198pp.

I received a Bachelor of Science degree in Botany from the University of California, Davis 1980.

Professional Affiliations

I served for five years as a subject matter expert as a member of the National Wildfire Coordinating Group (NWCG) Fire Behavior Subcommittee (2007-2012).

I currently serve on the Core Fire Science Advisory Committee, an interagency group providing fundamental guidance and oversight to the national fire behavior research needs in the U.S.

Fire Experience

I have worked on over 200 wildland fires in my career as a firefighter, fireline supervisor, and Fire Behavior/Long Term Analyst.

My experience as FBAN and LTAN includes two to three week assignments on large, complex fires burning under extreme conditions:

Fire	**Agency**	**State**	**Year**	**Size**	**Duration**
High Park	U.S. Forest Service	CO	2012	136 mi^2	3 weeks
Station	U.S. Forest Service	CA	2009	250 mi^2	7 weeks
Zaca	U.S. Forest Service	CA	2007	375 mi^2	6 weeks
Day	U.S. Forest Service	CA	2006	255 mi^2	5 weeks
Bar Complex	U.S. Forest Service	CA	2006	164 mi^2	4 weeks
Hayman	U.S. Forest Service	CO	2002	215 mi^2	3 weeks
Clear Creek	U.S. Forest Service	ID	2000	322 mi^2	12 weeks
Cerro Grande	U.S. Forest Service and National Park Service	NM	2000	73 mi^2	4 weeks

Qualifications – Wildland Fire

I currently maintain the following fire line qualifications, per the National Wildfire Coordinating Group (NWCG) Incident Qualification System:

Fire Behavior Analyst - 12 years.
Division/Group Supervisor - 14 years.
Strike Team/Task Force Leader- 16 years.
Engine Boss - 22 years.
Incident Commander, Initial Attack - 21 years.
Firefighter, Type 1 and 2 (advanced and basic) – 24 years.

Other Qualifications

I currently maintain additional qualifications:
Hazardous Materials Technician - past 7 years.
Swift Water Rescue Technician I - past 7 years.
EMT-A, Basic Emergency Medical Technician - past 21 years.

Additional Training

As a part of achieving and maintaining my wildland fire qualifications, I have successfully completed the following NWCG (National Wildfire Coordinating Group) courses:

S-590	Advanced Fire Behavior Interpretation (1999)
S-300	Incident Commander, Extended Attack (1997)
S-339	Division/Group Supervisor (1997)

I-300	Intermediate Incident Command System (1997)
S-234	Firing Methods and Procedures (1997)
S-330	Strike Team/Task Force Leader (1997)
RX-90	Prescribed Fire Burn Boss (1997)
S-490	Advanced Fire Behavior Calculations (1994)
I-347	Demobilization Unit Leader (1994)
S-300	Incident Commander Extended Attack (1993)
J-346	Situation Unit Leader (1993)
J-348	Resource Unit Leader (1993)
S-336	Fire Suppression Tactics (1992)
S-205	Fire Operations in the Wildland/Urban Interface (S-215)
S-260	Fire Business Management (1989)
I-220	Basic Incident Command System (1988)
S-211	Portable Pumps and Water User (1988)
S-212	Power Saws (S-212)
S-230/231	Single Resource Boss/Engine Boss (1988)
S-270	Basic Air Operations (1988)
S-130/190	Basic Wildland Firefighter, Intro. to Wildland Fire Behavior (1988)

Teaching

Advanced Fire Behavior Interpretation, S-590. 2002, 2004, 2006, 2008, 2010. Two-week course. Lesson instruction and student mentoring.

NWCG Firefighter Safety Refresher, national curriculum. Conducted two Unit Lessons on fire behavior, and human factors in fire behavior, for the national course curriculum. Distributed on DVD. 2008 and 2009.

Intermediate Wildland Fire Behavior, S-290. 2000, 2002, 2003, 2005. 32-hour course. Lead Instructor.

Introduction to Fire Behavior Calculations, S-390. 2002, 2004, and 2005. 24-hour course. Lead Instructor.

Advanced Wildland Fire Behavior Calculations, S-490. 1999, 2001, 2003. 40-hour course. Lead instructor.

Fire Operations in the Wildland/Urban Interface, S-215. 2003, 2004. 32-hour course).

Firing Methods and Procedures, S-234. 2001 and 2003. 24-hour course.

Single Resource Boss/Engine Boss, S-230/231. 2002. 32-hour course.

Annual Safety Refresher training for local county, state, and U.S. Forest Service personnel. Annually since 2001.

Other Presentations

International Fire Behavior and Fuels Conference; Spokane, WA. Extreme Fire Behavior. 2010.

Colorado State University, Forestry Dept. ; Ft. Collins, CO. Extreme fire behavior and critical fire weather. Invited guest lecture for upper-level Fire Management courses. 2003, 2004, 2009 and 2010.

U.S. Forest Service, Arapaho-Roosevelt NF; Ft. Collins, CO. Critical Fire Weather. Training session for US Forest Service seasonal personnel (2 hrs). 2007.

Annual Wildland Fire Refresher Training; Tahoe NF, CA. Human factors, line officer roles, and tactical decision making exercises for US Forest Service Fire Staff personnel. 2007.

Southern CA Training Officer's Association; Orange County, CA. Presentation on human factors and the fire environment (2 hrs). 03/2007.

Fire Behavior Analyst Workshop, Missoula, MT. Two presentations – FBAN involvement in investigations, and a case study of the Day Fire in S. CA (4 hours total). 2007.

Montana DNR Line Officer Workshop; Helena, MT. Organized and presented training on implications to line officers of firefighter burn over incidents on wildfires. 05/2006.

Redding (CA) Wildland Fire Workshop. Human factors on wildland fires (2 hrs). 2006.

Wildland Fire Safety Summit, Pasadena, CA. Presentation on the interaction of human factors and fire behavior (1 hr). 2006.

Canadian Forest Service, Fire Behaviour Specialist course; Hinton Training Centre, AB. Keynote address. 2006.

Wildland Fire Safety Summit; Missoula, MT. "Fire Behavior vs. Human Behavior: Why the Lessons from the Cramer Fire Matter" (1.5 hrs). 2005.

Regional Hotshot Crew Workshop, Southwest Region, U.S. Forest Service. Presentation of fire behavior and human factors in wildland fire fatalities. 2005.

Colorado State University, Forestry Dept.; Ft. Collins, CO. Wildland fire behavior and the fire environment; guest lecture for an upper-level Fire Management course. 2003 and 2004.

American Planning Association conference; Denver, CO. Facilitator for a field training session for wildland/urban interface planning and hazard mitigation. 2003.

Colorado Mitigation Conference; Denver, CO. Weather, Climate, and Fire Behavior – the effect of short-term and long-term atmospherics on fuels, firefighter safety, and risk. Panel discussion. 2002.

Publications – Primary and Contributing Author

Close, K. 2006. 20 Minutes at H-2: Linear Decision Making in an Exponential Fire Environment. In: Proc. 9th Wildland Firefighter Safety Summit; 2006 April 25-27, Pasadena, CA. Intl. Assoc. of Wildland Fire, Hot Springs, SD.

Close, K. 2005. Fire behavior vs. Human Behavior: Why the Lessons from Cramer Matter. In: Butler, B. W., et al. Eds. 2005. Wildland Firefighter Safety Summit – Human Factors; 2005 April 26-28; Missoula, MT. Intl. Assoc. of Wildland Fire, Fairfax, VA.

Interior West Fire Council. 1998. "Fire Management Under Fire – Adapting to Change." K. Close and R. Bartlette, eds. Proceedings of the 1994 Interior West Fire Council meeting and symposium, Coeur d'Alene, ID, 1-3 November, 1994. ISBN: 1-887311-02-5.

Close, K. and R. Wakimoto. 1995. Geographic Information Systems: Applications in Wildland/Urban Interface Fire Management Planning in Missoula County, MT. M. S. Thesis. School of Forestry, University of Montana, Missoula, MT. 198 pp.

Close, K, and R. Wakimoto. 1993. GIS Applications in wildland/urban interface fire planning: the Missoula County (Montana) project. In: 7th Annual Symposium on Geographic Information Systems in forestry, environmental and natural resource management. Feb. 15-18, 1993. Vancouver, BC. Pp 131-140.

Donoghue et al. 2003. Accident Investigation Factual Report: Cramer Fire Fatalities (U.S. Forest Service, 0351-2M48-MTDC). Provided fire behavior input to the main report, and authored Appendix C - Fire Behavior and Weather (24 pp.).

Graham, R.T., Technical Editor. 2003. Hayman Fire Case Study. Gen. Tech. Rep. RMRS-GTR-114. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 396 pp.

National Wildfire Coordinating Group (NWCG). 2008. Fire Behavior Analyst/Long Term Analyst task book revision. Provided input and content for a major revision of task books (national-level training criteria) for Fire Behavior Analysts and Long Term Analysts.

Walsh Environmental Scientists and Engineers, LLC. 2006-2009. Provided fire behavior and weather content for comprehensive Community Wildfire Protection Plans for the communities of Coal Creek Canyon, Evergreen, Fairmount, Golden, Golden Gate, Indian Hills, Inter-Canyon, and Clear Creek County.

Special Projects

Fire behavior of the McIntyre Hut and Bendora Fires on January 18, 2003 (Canberra, Australia). Expert witness on fire behavior for the Norton Rose law firm (representing the Australian Capital Territory government). Case pending.

Origin and spread of the EID and Cigarette Fires. Expert witness for a legal firm (McLachlan, McNab and Hembroff) in fire behavior, providing extensive and detailed analysis of the spread and behavior for two fires burning in proximity to each other. 2009. Case pending.

Growth and fire behavior of the Witch and Guajito fires. Expert witness for Travelers Insurance (Denenberg Tuffley, LLP), regarding the 2007 Southern California Fires. Analysis of fire behavior and spread from multiple ignitions. 2008-2009.

Burroughs v. U.S, "X" Fire. Expert witness, fire behavior. Assessment of fire origin, behavior and spread. 2008.

Brown and James, LLP. Expert witness, fire behavior and structural ignition from wildland fires. 2008.

U.S. Attorney's Office, District of Montana. *Backfire 2000 et al. vs. U.S. Government.* Expert witness, fire behavior. Provided comprehensive fire behavior analysis and re-construction of the fire chronology. 2005-2006.

Community Wildland Fire Protection Plans. Assisted in development of plans for multiple local jurisdictions in Colorado, primarily in providing fire behavior assessment. 2006-2009.

Larimer County, CO. Completed a federal matching-funds grant project involving the research, analysis, and development of practical applications for local WUI response, pre-planning, and hazard assessment for the northern Front Range of Colorado. 2006.

U.S. Forest Service, National Office. Cramer Fatality Investigation Team. Provided a detailed re-construction of the fire behavior leading to two firefighter fatalities; made several recommendations for organizational improvement that were implemented from this. 2003.

U.S. Forest Service, Rocky Mountain Research Station. Review Panel, Hayman Fire Case Study. Contributed input regarding fire behavior and fire suppression operations for a comprehensive written review of the Hayman Fire of 2002.

U.S. Forest Service, Angeles NF. Leona Fire arson investigation. Expert witness, fire behavior, and testimony in Los Angeles District Court. 2004.

Montana DNRC. Missoula, MT. Ryan Gulch Fire investigation. Expert witness, origin and fire behavior assessment. Analysis to determine the likely ignition location based on detailed fire behavior modeling and analysis. 2001.

National Park Service, National Office. Monument Fire Entrapment Investigation Team, Pecos National Historic Monument, NM. Provided detailed fire behavior analysis to the investigation of a firefighter entrapment. 2001.

EXHIBIT E

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

June 17, 2013

Alessandro Amaglio
Regional Environmental Officer
FEMA Region IX
U.S. Department of Homeland Security
1111 Broadway, Suite 1200
Oakland, California 94607-4052

Subject: Draft Environmental Impact Statement for the Hazardous Fire Risk Reduction Project; Alameda and Contra Costa, Counties, California. (CEQ# 20130114)

Dear Mr. Amaglio:

The U.S. Environmental Protection Agency (EPA) has reviewed the Draft Environmental Impact Statement (DEIS) for the Hazardous Fire Risk Reduction Project, (Project); East Bay Hills, California. Our review is provided pursuant to the National Environmental Policy Act (NEPA), the Council on Environmental Quality's NEPA Implementing Regulations (40 CFR 1500-1508), and Section 309 of the Clean Air Act.

The EPA appreciates the Federal Emergency Management Agency's (FEMA) commitment to protect people and structures from hazardous fire risk in the East Bay Hills. The DEIS articulates well the difficult decisions involved in reducing wildfire risk. EPA recognizes the need to minimize threats to public safety from wildfire, and we support this goal. Based on our review of the proposed action alternative, we have rated the DEIS as *Environmental Concerns – Insufficient Information* (EC-2) (see enclosed "*Summary of Rating Definitions*"), due to our concerns regarding potential impacts to natural resources and herbicide use. Our detailed comments are attached.

We are concerned that some of the aspects of the project could result in degradation of natural resources and may not provide for natural regeneration. We also note that extensive use of herbicides is proposed for the project and much of the DEIS is devoted to descriptions of herbicide use and assessment of risks posed to human health and the environment from that use. In the attached detailed comments, we recommend providing additional information regarding natural resource impacts and more information in the Final Environmental Impact Statement (FEIS) about the location, type, amount, and application method for herbicide use.

EPA appreciates the communication between our offices and the opportunity to review this DEIS. When the FEIS is released, please send one hard copy and 3 cd's to the address above (mail code: CED-2). If you have any questions, please contact me at (415) 972-3521, or have your staff contact James Munson, the lead reviewer for this project. James can be reached at (415) 972-3852 or Munson.James@epa.gov.

Sincerely,

Connell Dunning

for

Kathleen Martyn Goforth, Manager
Environmental Review Office
Communities and Ecosystems Division

Enclosures: Detailed Comments
Summary of the EPA Rating System

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)'s DETAILED COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT (DEIS) FOR THE HAZARDOUS FIRE RISK REDUCTION PROJECT, (PROJECT); ALAMEDA & CONTRA COSTA, COUNTIES, CALIFORNIA. (CEQ# 20130114)

Impacts to Natural Resources

The document assumes that areas will naturally regenerate, once rid of non-native species. We are concerned that some of the aspects of the project could result in degradation of natural resources and may not provide for natural regeneration. Further, while the DEIS includes a discussion of climate change, it does not include a detailed discussion of the potential impacts of climate change on the Project area. Current research indicates that climate change could impact the amount, timing, and intensity of rain and storm events; increase the length and severity of the fire season; modify the rate and distribution of harmful timber insects and diseases; and aggravate already stressed water supplies. A significant change in the weather patterns could have important implications for management of the Project area.

Recommendations:

EPA recommends that the FEMA consider whether more aggressive restoration efforts may be necessary to return such areas back into a natural state. We also suggest that the FEMA consider whether the 24 inches of wood chips, (page: ES-13) would alter the natural regeneration process and possibly retard native species' ability to repopulate the area. It may be prudent or necessary to replant native saplings to promote habitat restoration and avoid erosion, especially in light of changing temperatures and precipitation rates associated with climate change.

We also encourage FEMA to provide information in the Final Environmental Impact Statement (FEIS) regarding the decommissioning of skid trails after the project objectives have been met. Decommissioning should include scarifying the surface to break up compacted soils, seeding with native vegetation, and blocking these areas from hydrologic runoff.

EPA encourages the FEMA to consider the potential direct and cumulative effects of climate change on the resources that would be affected by the Project, including groundwater resources, sensitive species and the ability of native species to repopulate the treated area, and describe how the grant applicants will adaptively manage affected resources.

Noxious Weeds

Page 3-27 identifies the noxious weed species such as poison oak as common within the project area and states that the weeds would be treated by spraying their leaves; however, little information is given regarding mitigation measures to reduce the spread of noxious weeds prior to cutting and spraying.

Recommendations:

Clean all off-road logging and construction equipment prior to entering the project area to remove dirt, plant parts and material that may carry weed seeds. Avoid the use of construction equipment in weed infested area as much as possible and monitor all weed treatments for effectiveness.

Use certified weed-free seeds and plants for re-vegetation and erosion control.

Herbicide Use

Application

Appendix F and Appendix L present summaries of chemical characteristics for the herbicides being considered for use in the project areas: Garlon products, Stalker, and Roundup; however, the document does not identify the type of Roundup nor clearly identify which herbicides would be used where and on what plants or when they would be used. Also, triclopyr BEE (Garlon 4 Ultra) and triclopyr TEA (Garlon 3) have very different physical characteristics. Consequently, each needs an environmental fate assessment. For example TEA is very water soluble and has a low octanol/water partition coefficient (K_{ow}). BEE has low water solubility (although the DEIS incorrectly states that it is highly water soluble) and high K_{ow} Page 5.4-9 states "herbicide applications would be rotated for best impact during the growing season;" however, it does not describe specifically what would be rotated or how, or how decisions will be made in the field.

Recommendations:

The FEIS should state which herbicides (including which type of Roundup) will be applied to which plant species and identify which areas the herbicides will be used in. Clarify planned application rates of herbicides and explain how these will be adjusted as needed.

Discussions of fate and effects should clearly distinguish between active ingredients and formulated products[1] and the environmental fate of both triclopyr BEE and triclopyr TEA should be disclosed.

The FEIS should clearly state when species of concern reproduce and raise their young, and commit to not using herbicides during these seasons.

Water Quality

[1] For example, page L-5 states; "Garlon® 4 is reported to have low to moderate potential for bioaccumulation (Marin Municipal Water District 2008) based on the reported log K_{ow} (about 4).[1]" The bioaccumulation potential and log K_{ow} are for the active ingredient (triclopyr), not the formulated product.

Page 5.1-9 states; "foliar application of herbicides would not be allowed within a 60-foot buffer zone adjacent to ephemeral or permanent surface water bodies." From the document it is unclear what type of application method would be used to ensure protection of the proposed 60-foot buffer. Furthermore; page F-8 talks about the mixing of the herbicides that would take place but does not clearly state where mixing and storage of herbicides will take place or what measures would be taken should a spill occur.

Recommendations:

The FEIS should be clear that foliar applications will be done with backpack sprayers not aerial applications or other type of equipment that could result in more drift.

The FEIS should state that mixing and storage of herbicides will occur only outside of the proposed 60-foot buffer.

The FEIS should state if and where pesticides will be stored within the project area. \

Impacts to Species of Concern

Appendix Section 7.2, "Ecological Risk", states that it is "assumed that protection of the five listed species provides adequate protection of other less sensitive species. This assumption is based on the expectation that these five species are sufficiently sensitive to the proposed herbicides to serve as surrogates for other less sensitive but closely related species." However, listed species are not necessarily the most sensitive to herbicides. The risk assessment needs to be based on data for the most sensitive species available, which may or may not be the listed species.

Recommendations:

The FEIS should use toxicity data for the most sensitive species for which reliable data are available to ensure appropriate protections are in place and should be updated to include a discussion of chronic or sub-lethal effects.

EPA has completed a Pacific Salmon and Steelhead species risk assessment for triclopyr BEE (including one specifically for forestry use) and glyphosate. These documents should be part of this literature discussion. For more information go to: www.epa.gov/espp/litstatus/effects/index.htm

Page F-107 states that surveys should be conducted prior to herbicide application to identify all individual plants present in potential treatment areas, to the extent possible. This includes the pallid Manzanita. The DEIS states that buffer zones should be of sufficient size to ensure manzanita plants are protected from spraying and spraying drift; however, the root zones also need protection from triclopyr and imazapyr, which can migrate through soil.

Recommendation:

The FEIS should be expanded to reflect that herbicides triclopyr and imazapyr can migrate through soil with water.

Herbicide application should be avoided in root zones for both the pallid Manzanita and the Presidio clarkia.

Page F-12 of Appendix F states that "separate evaluation of risk to these species was conducted. Species of concern include California red-legged frog (CRLF)"; however, this section could benefit from incorporation of the EPA CRLF assessment.

Recommendation:

The FEIS should incorporate the EPA's California Red-Legged Frog risk assessments for the chemicals proposed for the project. Those documents should be part of this literature discussion. These assessments can be found at: www.epa.gov/espp/litstatus/effects/redleg-frog/index.html

Human Health and Safety and Exposure to Contaminated Vegetation

Toxicology Assessment

Table 4-1 of Appendix F lists toxicity categories as: Category I Highly Toxic to Eyes, and Category IV for skin, practically non-toxic. Table 4-1 also depicts Roundup as irritating to upper respiratory tract, but no Toxicity Category is noted. In addition, EPA questions inclusion of a cancer discussion in Section in 4 of the DEIS when page F-77 states, "None of the herbicides proposed for use in this project were identified as carcinogens." EPA agrees that the herbicides proposed for the project are not carcinogens.

Recommendations:

The FEIS should include a toxicity category for glyphosate due to upper respiratory irritation.

The FEIS should be modified to eliminate any confusion and state that there is no cancer risk from herbicides proposed for use in connection with this project.

Page 5.10-7, discusses four parts of a human exposure pathway. One of the parts says, "A transport mechanism for movement of chemicals to a point of human contact...." and we note there is a potential for human contact even if the chemical does not move after application). Page F-50 goes on to state that "for workers, general exposure involves handling and application of herbicide",yet little is said about other non-applicator workers in the project area that could come into contact with the applied herbicides after the fact. Further, Section 3.2.2.1 states that "residents could also be exposed to herbicides directly during application and indirectly after application if herbicides migrate from the original application area." Yet the document does not sufficiently address the possibility of people and or animals entering the treated area and coming in contact with herbicides already applied. Page 5.10-11 states that the risk to the general public from exposure to herbicides would be reduced by limiting access to treated areas such as. "slashing of fruit bearing species prior to herbicide application (Appendix F)" as a way to reduce exposure; however, it's unclear if this will be done as part of the project.

Recommendations:

The FEIS should describe what type of exposure could occur should people and or animals come in contact with previously applied herbicides in the treatment areas and should clarify that there is potential for human exposure even if the chemicals do not move from the application site.

The FEIS should be expanded to include all workers in the project area such as those conducting timber removal and other fuel reduction activities and should clearly state if workers are also covered in the "Maximum Exposed Individual," (page: 5.10-7) scenario.

The FEIS should include a mitigation measure to remove fruiting or other edible vegetation.

Induced Growth

Section "4.13 Land Use and Planning" lists the grant applicants' broad-spectrum land use plans. It appears that some of the infrastructure development projects may overlap with areas planned for tree removal, such as "faculty housing, campus retreat center, recreational use and mixed-use development in the southern shoreline area". Given that development is not included in the purpose and need for this Project, it is unclear whether the trees in these overlap areas would be removed for construction purposes regardless of whether they are removed as part of the proposed Project or not. If the development would not occur if not for the groves being removed, then the development should be evaluated as induced growth impacts of the proposed Project.

Recommendation:

The FEIS should describe the reasonably foreseeable future land use and clarify the relationship between the proposed action and the future development activities. The document should provide an estimate of the extent of development, likely location, and the biological and environmental resources that would be affected if the proposed vegetation removal is inducing additional development.

Herbicide Labeling Clarification and Minor Edits and Clarifications

EPA provides the following additional recommended clarifications and minor edits to the document.

Labeling Requirements

The table on page F-79 implies that instructions on the herbicide labels are considered mitigation practices for this project. However, following the label is a requirement for use of the product. If personal protection equipment (PPE) requirements are on the label, they must also be followed. Actions taken to further reduce risk from exposure should only be considered mitigation if they are above and beyond the printed label on the herbicide.

Recommendations:

The FEIS should state that herbicides will be used according to product labels and should ensure that numbers and rates of annual applications allowed by herbicide labels will not be exceeded.

The FEIS should clearly state that "unmitigated", for this project, means following the label with no further measures taken to reduce or offset impacts.

If "without mitigation, (Table 5-1.)" means not following the label, then this should be removed from the document and not considered as a viable practice for the federal action.

Page F-80 incorrectly states that Best Management Practices (BMPs) "to be implemented include use of appropriate PPE and requirements for specific safety training for all applicators."

Recommendation:

The FEIS should clearly state that use of PPE is not a BMP; rather PPE is a requirement on the printed herbicide label.

Page F-10 of Appendix F on General BMPs states: "to prevent drift – wind must be less than 3 to 5 mph" while Ecological BMPs on the same page states "Apply on windless days to reduce drift". Furthermore, Section 3 of the DEIS on page 3-28 states "No spraying of foliage would occur within 60 feet of standing or flowing water or when wind speed is greater than 10 mph or less than 2 mph.." Appendix L includes the BMP "apply on windless days, (page: L-6)." That is inconsistent with other guidance about not applying if wind speed is "less than 2 mph", stated on page: F-8.

Recommendation:

Wind speeds for application of herbicides should be consistent throughout the FEIS and the FEIS should be modified to ensure that Appendices F and L are consistent.

(Page F-96) states: "a No-Observed Adverse-Effect Level (NOAEL) is often estimated from an experimentally derived Lowest Observed Adverse Effect Levels or (LOAELs), by applying a factor of ten to the LOAEL (NOAEL =LOAEL/10). Similarly, a LOAEL can be estimated from an experimentally derived NOAEL, often using the same factor of ten (LOAEL = NOAEL * 10)." No reference is given for this approach for aquatic species.

Recommendation:

The FEIS should provide a reference to support using this approach for estimating LOAEL from NOAEL (and vice versa) for aquatic species.

Page 5.4-8 states that "stump application of all herbicides (e.g., Garlon 4 Ultra, Roundup, Stalker, or Garlon 3A) would be conducted by a State of California Qualified Applicator or by staff under their supervision." The title "Certified Pesticide Applicator" is used on page 4.5-19. The inconsistency in terminology should be changed because they come with different authorities. "California Qualified Applicator" is the correct terminology. "Certified Pesticide Applicator" is reserved for those licensed to use Restricted Use Pesticides (RUP, per EPA) or Restricted Materials (per CA). None of the pesticides proposed for use in this project is an RUP.

Recommendation:

Terminology should be consistent throughout the FEIS using the title California Qualified Applicator.

Page F-15 states, "In this report the term pesticide can refer to both pesticides and herbicides. Current use of pesticides and herbicides by sub-applicants is limited and chemicals are used only as a backup to other control methods in most areas." Pesticides are all of the "-icides": insecticides, herbicides, rodenticides, etc. It's unclear what "pesticides" means here because there is no need to say "pesticides and herbicides."

Recommendation:

Revise wording in the FEIS to specify if only herbicides are used. If other "-icides" (e.g., insecticides) are planned for the project than this should be stated in the FEIS.

Table 2-1 summarizes the proposed herbicide applications for implementation of the proposed and connected actions by project area. The table shows that the adjuvant, Hasten, planned to be used in many of the project areas, yet little description is given regarding how it affects behavior of the herbicides in the environment, and any potential environmental or human health concerns from the adjuvant itself.

Recommendation:

The FEIS should describe Hasten and any potential environmental and or human health concerns from its use.

Page F-65 states that "a post-marketing risk assessment takes place during the use of pesticides and aims at assessing the risk for exposed operators. Results of these risk assessments are the bases for the health surveillance of exposed workers." It is not clear what "post-marketing risk assessments" is referring to. There is no routine post-marketing risk assessment work done by EPA after a pesticide is registered, nor is there routine worker health surveillance.

Recommendations:

The FEIS should provide a reference for this statement and clarify what risk assessments and surveillance this refers to.

Page F-72 states "EPA (IRIS 2012) determined a reference dose (RfD) of 0.1 mg/kg/day for glyphosate based on a 3-generation rat reproduction study." However, the IRIS is out of date for glyphosate. Results of this study are described as "spurious" in EPA's Re-registration Eligibility Decision and in Registration Review documents. The RfD of 2 mg/kg/day, which was selected for the EIS, did not come from this rat study. The 2mg/kg/day value comes from a rabbit developmental toxicity study not a rat study.

Recommendations:

Remove the in accurate IRIS reference and include the correct rabbit reference.

Table 4-2 (Page F-74 - F-76) is very hard to interpret. EPA suggests that the table should be modified to reflect the data more clearly and in some cases with updated information.

Recommendations:

The FEIS should specify if the amphibian toxicity values are expressed as concentrations in water. The table should also reflect how "safe level" was determined and if this "safe level" is for all stages of species development or just fully developed adults.

The FEIS should confirm whether or not the toxicity values for glyphosate selected for the EIS mesh with 2008 EPA CRLF assessment.
http://www.epa.gov/oppfead1/endanger/litstatus/effects/redleg-frog/glyphosate/determination.pdf

EXHIBIT F

UC Berkeley - Completed Vegetation Management Projects						
Date	Location	Acres	Eucs	Pines	Acacia	Other
Sept-Oct 2000	Panoramic Hill	30		840		
July-Aug 2001	Claremont Canyon	2	X			
Aug-02	Claremont Canyon	8	X			
Sep-03	Claremont Canyon	20	X			
	Claremont Canyon		950			
2006	Claremont Canyon		1000	?		
	Claremont Canyon	14	3200	?	?	
2004	PG&E Transmission Line		546	?		
2004	Frowning Ridge		210			
2006	Frowning Ridge	11	1900	?		
Mar-04	Frowning Ridge/Chaparral Hill					
Apr-04	Frowning Ridge/Chaparral Hill	25	1400	45		
	Chaparral Hill	9	1800	36		
	Claremont Canyon	14	3200			
Sep-07	Lower Strawberry Canyon	8	1000	50		
Nov-07	Clark Kerr Track	5	800		50	
Nov-07	Chaparral Hill	4	600	100		
		150	16606	1071	50	17727

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Fire Mitigation

Fire Mitigation Program
Annual Workplan
Large Projects
Fire Mitigation Committee
Committee Reports
Claremont Canyon Conservancy
Hills Emergency Forum (HEF)
Fire News

Fire Mitigation Program

The campus Fire Mitigation Program is responsible for planning and directing the vegetation management efforts required to mitigate the threat of a wildland fire. The Office of Emergency Preparedness, a unit within the University Police Department, administers the program. In carrying out the program, the manager of OEP is guided by the campus Fire Mitigation Committee, Chaired by Professor Scott Stephens of the College of Natural Resources.

The Fire Mitigation Program develops and implements the annual fire management workplan and plans and executes large projects as set forth in the the 2020 Fire Plan (4077Kb). The annual workplan involves the clearing of light fuels (annual grasses and brush) from building perimeters, roadsides and turnouts. Both hand crews and goat herds are used to conduct this work. Additionally, prescribed fire is also available as a tool that may be used as conditions warrant.

In 2006, UC Berkeley opened the Center for Fire Research and Outreach, including the ongoing work of directors, faculty and researchers, collaborators and staff. The primary mission and goals of the Center are to:

- Become a focal point for science-based solutions to fire-related challenges.
- Encourage and facilitate collaboration on fire-related research questions among academics, practitioners, decision-makers, and government agencies.
- To provide the diffuse land-holding public with a centralized clearinghouse for information needs before, during and after wildfires.

For additional information on media coverage of the UC Berkeley Fire Mitigation Program and its projects, please refer to the News Section of this website.

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Annual workplan

Hand crews Hand Crew Workplan (5,166Kb) consist of contracted workers using gas powered weed whackers and light chain saws to remove grass, brush , limbs and small trees from prescribed areas. The crews move from site to site following a prioritized site map, and are typically active from mid- June to early August. The crews are able to be more selective than goats and can conduct more complex arbor work, herbicide application and selective removal than can the goats.

Project maintenance involves the ongoing management of the large-scale projects (557Kb) – typically the conversion of eucalyptus forests and maintenance of large scale fire breaks along the ridge line. Several times each year contracted crews, UC employees and volunteers visit past project sites to perform specific maintenance activities. The work includes the removal of eucalyptus re-sprouts and seedlings, as well as the reduction of brush, annual grasses, invasive exotics and toxic weeds.

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Large projects

The Hill Campus is designated by CalFIRE and by the Cities of Oakland and Berkeley to constitute a Very High Hazard Severity - the most dangerous rating of state land. To manage this threat, the Fire Program develops large projects -- strategic fuel reduction efforts intended to create fire safety improvements over many years. Typically, large projects remove invasive eucalyptus trees, acacia trees and pine trees and decadent brush from locations necessary to fight or contain a wildfire. For campus lands, these locations area found along the upper canyons, roughly parallel to Grizzly Peak Blvd. Additional strategic sites include the ridgeline between Strawberry and Claremont Canyons, neighborhood interface zones near the Panoramic hill and North Berkeley neighborhoods, and the Hill Area management zone protecting the UC hill facilities and the Lawrence Berkeley National Laboratory. A map of projects (Map - strategic projects - 670 Kb) both underway and in planning shows the location of these strategic efforts.

"DURING THE AGE OF EXPLORATION, CURIOUS SPECIES from around the world captured the imagination, desire and
enterprising spirit of many different people. With fragrant oil and massive grandeur, eucalyptus trees were imported in great
numbers from Australia to the Americas, and California became home to many of them. Eucalyptus globulus, or Tasmanian blue gum, was first introduced to the San Francisco Bay Area in 1853 as an ornamental tree. Soon after, it was widely planted for timber production when domestic lumber sources were being depleted. Eucalyptus offered hope to the "Hardwood Famine", which the Bay Area was keenly aware of, after rebuilding from the 1906 earthquake." Taken from a 2006 informational brochure (1,831 Kb) on the issue of eucalyptus management, prepared by the Golden Gate National Recreation Area, a unit of the National Park Service.

Completed Projects

- FEMA Panoramic Hill (23Kb)
- Claremont Phase 1 (364Kb)
- Claremont Phase 2 (329Kb)
- Claremont Phase 3 (11Kb)
- Claremont Phase 4 (253Kb)
- Claremont Canyon Phase 5 (781Kb)
- Claremont Canyon Phase 6 (385 Kb)
- Frowning Ridge Phase 2 - PGE Transmission Line (440Kb)
- Frowning Ridge Phase 3 (320Kb)
- Frowning Ridge Phase 4 (1285Kb)
- Brontosaurus – Chaparral Hill (127Kb)
- Chaparral Hill Phase 1 Report (898Kb)
- Chaparral Hill – Phase 2A,B&C (977Kb)
- Claremont - Phase 6 (385 Kb)
- Lower Strawberry Canyon (424Kb)
- Clark Kerr Campus Track (384Kb)
- Chaparral Hill Phase 3 (841Kb)

In planning

- FEMA - PDM 2005 - Strawberry Canyon (1,048Kb)
- FEMA - PDM 2005 - Claremont Canyon (1,024Kb)
- FEMA - PDM 2006 - Frowning Ridge (883Kb)

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Fire Mitigation Committee:

The Fire Mitigation Committee (29Kb) is charged by the Vice Chancellor for Administration on behalf of the Chancellor to formulate and recommend policy that will support the management of fire hazards within the U.C. Berkeley Hill Campus. The Committee (21Kb) is composed of students, academics and administrative staff who have a professional concern for or interest in the Hill Campus and its wildlands. The Committee, chaired by Professor Scott Stephens, is charged with the following tasks:

- Recommend policy and strategies to manage fire hazards in the wildland/urban interface areas;
- Review campus compliance with existing and pending Federal, State, and Local laws and regulations relating to wildland fire issues, including but not limited to Clean Water Act, Migratory Bird Treaty Act, and Endangered Species Act codes;
- Provide the Vice Chancellor with recommendations on appropriate measures and costs to minimize fire hazards in the Hill Area;

- Review and recommend changes to activities that impact fire safety of wildland areas owned by the University that are adjacent to the Berkeley central campus; and,
- Verify that the Berkeley campus 2020 Hill Area Fire Fuel Management Program and any future or updated Fire Mitigation Programs are implemented and are effective

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Committee Reports

- 1999 Annual Report (98Kb)
- 2001-2002 Bi-Annual Report (84Kb)
- 2003-04 Bi-Annual Report (4,795Kb)
- 2005 Annual Report (6,108Kb)
- 2006 Annual Report (4,016Kb)
- 2007 Annual Report (4,035Kb)
- 2020 Hill Area Fire Fuel Management Program (4,077Kb)
- Eucalyptus Brochure (648Kb)
- Claremont Canyon Erosion Study (1,766Kb)
- Fire Road Best Management Practices (1,350Kb)
- Alameda Whipsnake Recovery Plan (2,959Kb)
- Hill Area Plant Inventory (112Kb)

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Claremont Canyon Conservancy

The Claremont Canyon Conservancy (http://ccconservancy.homestead.com/home.html) is dedicated to reducing wildfire hazards in the canyon, improving public access, and understanding the ecosystem health of the entire watershed - then preserving or restoring it consistent with public safety. "

Background
In order to mitigate the risk of wildland/urban fires, the University is continually performing vegetation management projects on its land holdings in the East Bay hills. The vegetation management work in Claremont Canyon, overseen and conducted by the Campus in collaboration with members of the Hills Emergency Forum, seeks to transform the canyon into a more fire-safe condition. Past University projects have focused on removing re-sprouted eucalyptus trees along the upper reaches of the canyon. In order to complete the conversion of these sites to a sustainable and fire-safe vegetation type, ongoing maintenance -- including plantings of desirable species -- will be necessary. The Claremont Canyon Conservancy and the University have developed a memorandum of understanding to guide an ongoing collaboration in this stewardship. This MOU sets forth a process by which the University and the Conservancy will work together toward achieving the common objective of creating a sustainable, environmentally sound and fire-safe landscape. The evolution of this partnership was covered in a story by Andrea Pflaumer in The Monthly, October 2006.

Under this MOU, the Conservancy is authorized to conduct vegetation plantings and associated landscape maintenance on University lands. The University also conducts plantings and maintenance in the same locations; thus there is a joint stewardship of the canyon wildlands. The Claremont Conservancy carried out a Redwood Planting project and several Yellow Star Thistle Removal projects in 2005, with additional projects planned for 2006 and beyond. The Redwood reforestation effort, targeting a portion of the area cleared of eucalyptus, has been active for several years. Conservancy Vice President Joe Engbeck, redwood project manager, has composed an overview of the history of the reforestation project through 2007. For those interested in volunteering on a project, please contact the Conservancy and bring a signed release waiver before beginning your activities.

A written work plan is jointly developed by the University and the Conservancy, and serves as the guide to vegetation restoration and maintenance work. The work plan is expected to evolve and adapt over time and is subject to mutually determined revision on a periodic basis.

In 2004, the membership of the Claremont Canyon Conservancy generously supported the Claremont Canyon Phase 4 (253Kb) eucalyptus removal project by contributing funds derived through its membership. Through its contribution of $14,000, the Conservancy partnered with the University and Pacific, Gas and Electric Company in the removal of 1150 eucalyptus trees on the ridgeline of Claremont Canyon.

Complementing the Claremont Canyon Conservancy's stewardship effort is the web site: WILD LIFE in the NORTH HILLS - **Flora and Fauna of Claremont Canyon, Oakland, California** This website documents wildlife and wild plants found in the hills on the border between Oakland and Berkeley, California. The area covered is roughly bounded by Tunnel Road, Domingo Avenue, Claremont Canyon, and Grizzly Peak Blvd., with emphasis on Claremont Canyon and the surrounding hillsides. The website is a work in progress by dedicated webmaster **Kay Loughman.** The site includes pictures of birds, insects, mammals, reptiles, etc. Currently, new photographs documenting wild plants and pictures of fungi are being assembled.

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Hills Emergency Forum (HEF)

The Hills Emergency Forum exists to coordinate the collection, assessment and sharing of information on the East Bay Hills fire hazards and, further, to provide a forum for building interagency consensus on the development of fire safety standards and codes, incident response and management protocols, public education programs, multi-jurisdictional training, and fuel reduction strategies.

The HEF is comprised of the following members:

- University of California, Berkeley
- Lawrence Berkeley National Laboratory
- City of Berkeley, Office of Emergency Services
- City of Oakland
- City of El Cerrito
- East Bay Municipal Utility District
- East Bay Regional Park District
- California Department of Forestry and Fire Protection
- Moraga Orinda Fire District

The Manager of the Office of Emergency Preparedness represents UC on the Staff Liaison Committee (SLC), and the Vice Chancellor for Administration represents the campus on the executive board. The SLC is responsible for developing and monitoring progress on the Forum's annual work plan, maintaining liaison with agency executives on HEF issues, identifying issues for possible legislative support, and coordinating the HEF annual public meeting. The HEF SLC also serves as a forum for the development of collaborative work agreements and for the development of joint grant applications.

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Panoramic Hill Fuel Reduction Project

From early September to mid-October 2000, UC Berkeley will continue its project to decrease the threat of significant property damage from wildfires by thinning the density of woody materials on university property east of the campus in the Panoramic Hill area.

The 30-acre project area has been identified as a high-risk priority area. The condition of the brush and trees requires a higher level of treatment than the annual low brush and grass clearing by hand crews and goats. About 840 of the approximately 2,400 trees in the area are slated for removal. Most are non-native conifers (planted in the 1920s and 30s for teaching and research) that are weak, diseased, and dying. The project will be conducted in phases. Phase I is scheduled for this Fall; Phases II and III are planned to begin in Spring 2001.

The project is partly funded by the university, with a matching grant for hazard mitigation from the State of California Office of Emergency Services (OES) and the Federal Emergency Management Agency (FEMA). The project has the support of the Hills Emergency Forum members, local government officials, and the Panoramic Hill Association.

Detailed Information

Phase I

Phase I will focus on a 10-acre area near the end of the Lower Jordan Fire Trail (see map for detail), and includes the following measures:

- Trees will be pruned or cut into lengths of 24 feet or less. There will be no clearcutting. The contractor will donate healthy wood to PAL (Protect All Life) for lumber and artistic projects. Unhealthy pines will be disposed of locally so as not to spread pitch canker to the Sierra Nevada.
- Small material will be chipped and spread to help prevent erosion.
- Disturbed soils will be seeded with indigenous grasses and wildflowers.
- The project will generate noise and dust. If warranted, the contractor will implement dust containment measures.

Project Benefits

-
- Reduces fire hazards where wildlands meet residential areas.
- Reduces threat of spot fires spreading to the surrounding community.
- The resulting shaded fuel break reduces the threat of burning embers being cast into nearby residential neighborhoods and will help provide defensible space for fire crews working along the ridge between Strawberry and Claremont Canyons.
- Pruned trees reduce the threat of fire spreading by way of treetops.
- Removes diseased trees and heavy fuels.
- Returns the area to a more natural state.
- Existing wooded skyline will remain.

Phase I Schedule

- **Timeframe** First week of September- mid-October 2000
- **Work Hours** Hills area: Monday-Friday, 8:00 am-5:00 pm.
  Hauling: 9:00 am-4:00 pm, to avoid peak traffic hours.

Parking and Accessibility

- The Lower Jordan Fire Trail will be closed Monday-Friday, 8:00 am-5:00 pm. It will be accessible on weekends.
- A parking lot on the south side of Centennial Road near the base of the fire trail that will be used for staging and equipment will be closed from the end of August to the end of October.

The Alameda Whipsnake

The Alameda Whipsnake (Alameda striped racer) (*Masticophis lateralis euryxanthus)* was designated as an endangered species in December 1997. The whipsnake is slender, fast-moving, and sooty black with distinct yellow-orange stripes on each side. It is non-venomous. It can reach a length of up to four feet and feeds almost exclusively on lizards. As biological studies have indicated that whipsnakes may be present in the project area, the University is working with a biological consultant to monitor their activity and measures have been included to protect and redirect them away from the affected areas.

Environmental Review

The environmental consequences of the fuel management and removal activities have been reviewed in accordance with the California Environmental Quality Act (CEQA). The University circulated a Tiered Initial Study/ Mitigated Negative Declaration for this project in Fall 1999. The campus responded to comments received and formally adopted the project on April 4, 2000. As part of the project's environmental compliance efforts, a Mitigation Monitoring Committee consisting of area residents, campus faculty and staff, and local fire protection agencies has been established to review the project during implementation.

2001 Claremont Canyon Headslope Fire Fuel Mitigation Project

In July-August 2001, the Campus will perform the major clearance of roughly 80,000 square feet (almost 2 acres) of eucalyptus in a particularly high-ignition prone grove at the headslope of Claremont Canyon. The grove sits on a low saddle between higher East Bay hills topography and acts as a natural funnel to direct hot easterly Diablo winds westward and down through the dense chaparral of Claremont Canyon.

The eucalyptus grove resprouted after the 1972 freeze and features a very dense growth with an understorey of mature poison oak. Within the grove, however, are scattered 30-year-old redwoods and bays. With removal and inhibition of the eucalyptus, the considerably less fire-prone redwood/bay community will dominate – with the added enhancement of bay views previously blocked by the eucalyptus.

The grove is sited along the west side of Grizzly Peak Boulevard in the City of Oakland on University property. The approximate cut area is 80,000 square feet (c. 150' x 600'), with some flexibility in determining the exact width and length of the cut zone. Under contract to Physical Plant and Campus Services, a contractor will fell all eucalyptus (with the possible exception of any few mature trees within the site) and remove all poison oak and other ladder fuels.

Following standard procedure of local and state public agencies, trunks will be immediately treated after cutting with an inhibitor to prevent resprouting. Limbs will be stripped from felled trees and chipped in place, along with undergrowth ladder fuels. Trunks may be left where felled, section-sawn and left, or removed at contractor's discretion. Redwood and bay trees in the site will not be cut and will be protected from damage during the project.

Existing Physical Condition

- The ridgetop at the head of Claremont Canyon along which Grizzly Peak Boulevard runs forms a low saddle between higher East Bay hills topography.
- When seasonal conditions foster the occurrence of easterly Diablo winds, the lower elevation of this saddle funnels the hot Diablo winds westward and down through Claremont and Gwin Canyons.
- A dense campus-owned eucalyptus grove on the steep canyon headslope along the west edge of this saddle is directly in the path of any such Diablo wind action.
- The grove is immediately adjacent to the Grizzly Peak Boulevard right-of-way.
- Many California wildfires start from ignition of roadside detritus by discarded cigarettes from passing vehicles or hot catalytic converters of parked autos.
- While eucalyptus itself is not a particularly high-grade fire fuel, it produces large amounts of flammable detritus – shredded bark, leaves, and nuts – which can act as flaming ignition torches easily carried by the typically 25 mile-per-hour or faster Diablo winds.
- Thus, the Claremont saddle's roadside grove is a considerable ignition risk.
- The Campus Arborist notes that resprout removal is cost-effective for fire mitigation but agrees that thinning of this grove and reduction of its adjacent ladder fuels and detritus is appropriate under the above-described conditions.

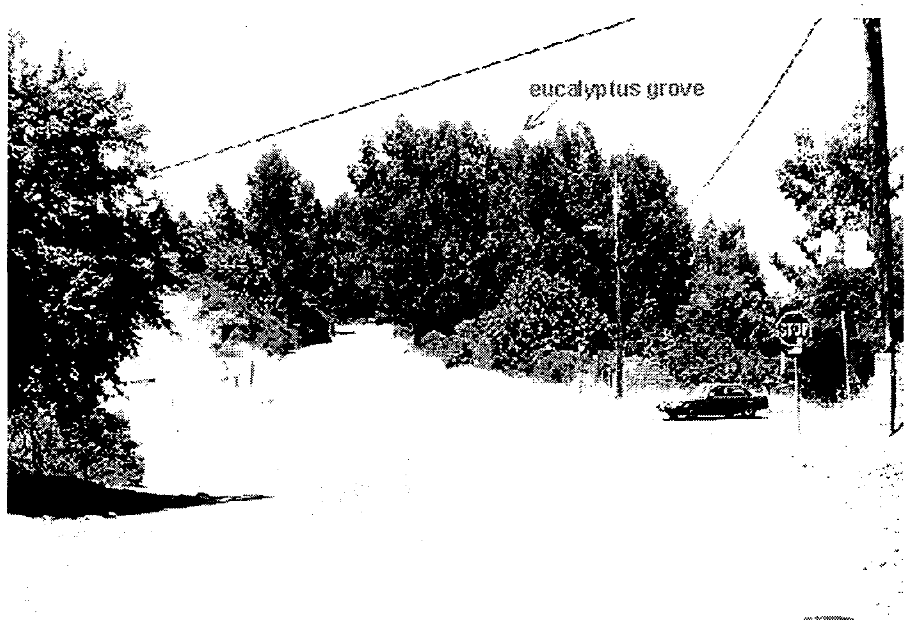
Community Relations Considerations

- Two separate reports are pending from Claremont Canyon residential neighbors; both reports call for increased campus fire mitigation stewardship and specifically target the eucalyptus grove described above.
- Residential neighbors are critical of what they characterize as years of costly discussion but little physical fire mitigation by Claremont Canyon public landowners.

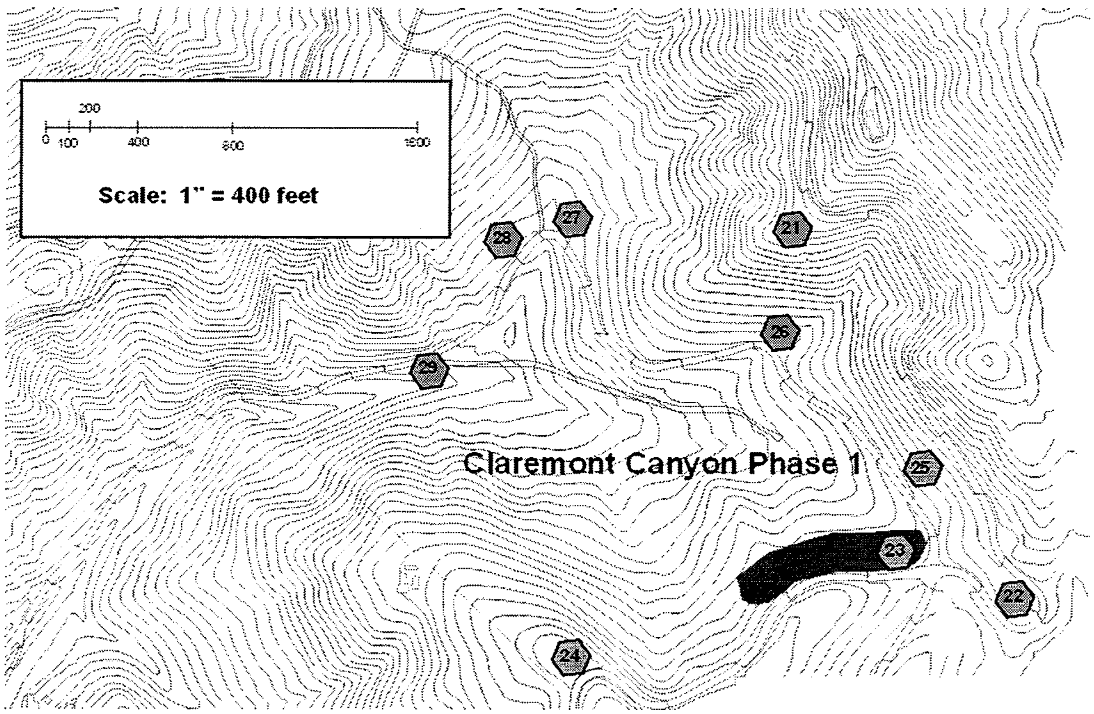
- City of Oakland Fire Chief has requested that the campus demonstrate a strong 2001 fire mitigation effort in Claremont Canyon, in addition to existing and ongoing campus fire mitigation programs.

LONG-TERM FIRE AND LANDSCAPE PLANNING CONSIDERATIONS

- It has taken only ten years for Claremont Canyon to reproduce the vegetation conditions that fueled the 1991 Tunnel Fire.
- The campus could be legally viewed as having a public safety liability to control fire fuels on its canyon property.
- East Bay hills landscapes are much different today from the oak grasslands of pre-European settlement conditions; evolution from logging to grazing to undeveloped wild landscape has produced a fire-prone chaparral/woodland mix being gradually invaded by exotic – and also fire-prone – species such as French broom.
- The FEMA Panoramic Hill Fire Fuel Mitigation program can be used as a basis from which to estimate costs for thinning and renovation of the saddle headslope grove, altho' Pan Hill was probably more expensive in terms of dollars per stem or acre -- we paid much closer aesthetic attention to the Panoramic site because of its proximity to homes and recreational trails.
- Possible contributors to a eucalyptus grove mitigation project might include Capital Projects and Business and Financial Services (Community Relations, Physical Plant, Emergency Preparedness).
- Both immediate and multi-year efforts should be examined to bring about a cost-effective, long-term mitigation.



"Four Corners": intersection of Grizzly Peak Blvd with Claremont Ave/Fish Ranch Rd



"Four Corners": intersection of Grizzly Peak Blvd with Claremont Ave/Fish Ranch Rd

2002 CLAREMONT CANYON HEADSLOPE FIRE FUEL MITIGATION PROJECT – PHASE 2

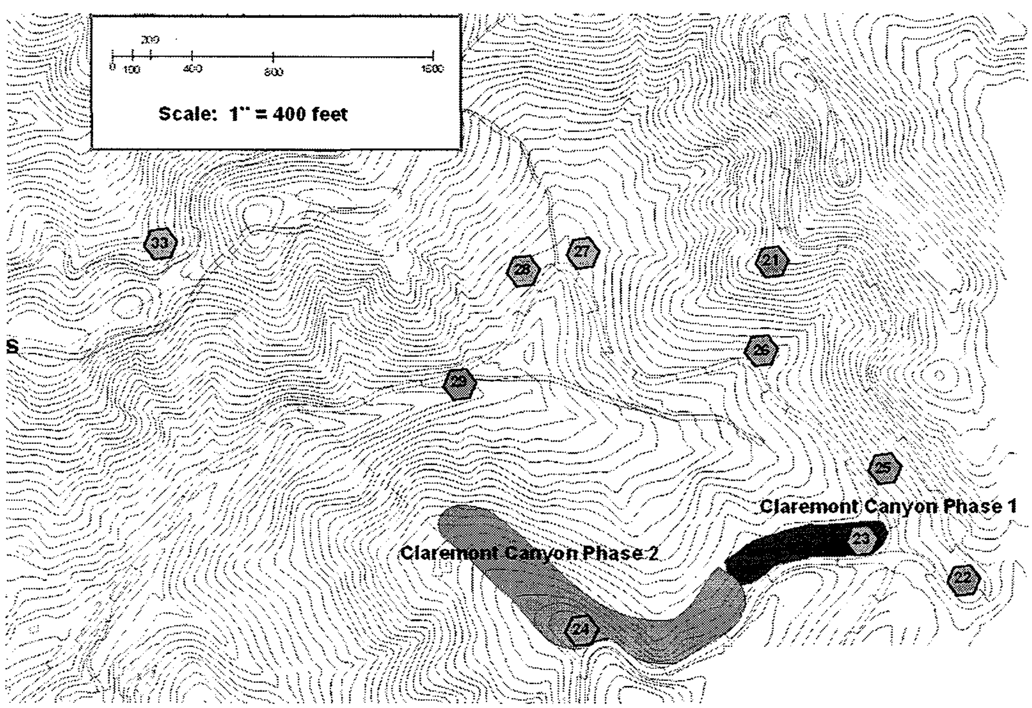
In August 2002, the Campus will perform a major clearance of roughly 320,000 square feet (almost 8 acres) of eucalyptus in a particularly high-ignition prone grove at the headslope of Claremont Canyon. The grove sits on a low saddle between higher East Bay hills topography and acts as a natural funnel to direct hot easterly Diablo winds westward and down through the dense chaparral of Claremont Canyon.

The eucalyptus grove resprouted after the 1972 freeze and features a very dense growth with an understorey of mature poison oak. Within the grove, however, are scattered 30-year-old redwoods and bays. With removal and inhibition of the eucalyptus, the considerably less fire-prone redwood/bay community will dominate – with the added enhancement of bay views previously blocked by the eucalyptus.

The grove is sited along the west side of Grizzly Peak Boulevard in the City of Oakland on University property. The approximate cut area is 150,000 square feet (c. 150' x 1000'), with some flexibility in determining the exact width and length of the cut zone. Additionally, a 3 + acre site on the hip ridge adjacent to the Marg property will also be cleared of eucalyptus trees and brush. This second site, which was burned during the 1991 Tunnel fire, exhibits 11 year old eucalyptus trees that have grown to heights exceeding 60 feet.

Under contract to Physical Plant - Campus Services, a contractor will fell all eucalyptus (with the possible exception of a few mature trees within the site) and remove all poison oak and other ladder fuels.

Following standard procedure of local and state public agencies, trunks will be immediately treated after cutting with an inhibitor to prevent re-sprouting. Limbs will be stripped from felled trees and chipped in place, along with undergrowth ladder fuels. Trunks may be left where felled, section-sawn and left, or removed at contractor's discretion. Redwood and bay trees in the site will not be cut and will be protected from damage during the project.



2003 Claremont Canyon Fire Fuel Mitigation Project

In September 2003, the Campus will perform a major clearance of roughly 850,000 square feet (almost 20 acres) of eucalyptus in a particularly high-ignition prone grove at the headslope of Claremont Canyon. The grove sits on a low saddle between higher East Bay hills topography and acts as a natural funnel to direct hot easterly Diablo winds westward and down through the dense chaparral of Claremont Canyon.

The eucalyptus grove re-sprouted after the 1972 freeze and features a very dense growth of eucalyptus with an understorey of mature poison oak. Within the grove, however, are scattered 30-year-old redwoods and bays. With removal and inhibition of the eucalyptus, the considerably less fire-prone redwood/bay community will dominate – with the added enhancement of bay views previously blocked by the eucalyptus. The approximate stem count of the work is +/- 1800 stems.

The grove is sited along the North side of Grizzly Peak Boulevard in the City of Oakland on University property. The approximate cut area is 850,000 square feet (c. 850' x 1000'), with some flexibility in determining the exact width and length of the cut zone. Under contract to Physical Plant - Campus Services, a contractor will fell all eucalyptus trees on the work sites.

Following standard procedure of local and state public agencies, trunks will be immediately treated after cutting with an inhibitor to prevent re-sprouting. Branches will be cut into smaller sections and scattered. Those branches that fall within 100 feet of the roadway will be chipped. Trunks will be left where felled, section-sawn and left, or removed, depending upon the site conditions. Redwood and bay trees in the site will not be cut, and care will be taken to protect these specimens during the project.

For further information, please contact Tom Klatt, Director of Emergency Planning, UC Police Dept. 642-1258 or tklatt@uclink.berkeley.edu.

Follow-up tx
of resprouts

Upper Claremont Canyon Fuel Management Project – Phase 4

Project Description:

The project will clear up to 950 re-sprouted eucalyptus trees and adjacent shrubs from a parcel of University land at the intersection of Grizzly Peak Blvd and Claremont Ave. The project location is the headslope of a heavily vegetated canyon immediately adjacent to the cities of Oakland and Berkeley, near the site of -- and displaying similar fire risk conditions to -- the catastrophic 1991 Tunnel Fire. (see map)

In the project location, the understory is a rich assembly of native tree and shrub species growing beneath a canopy overwhelmingly comprised of resprouted eucalyptus trees. The eucalyptus reproduces rapidly from nuts and resprouts, increasing the fuel load and density. Additionally, a small percentage of the canopy assemblage comprises exotic Red Gum Eucalyptus species, which also spread rapidly and produce flammable litter.

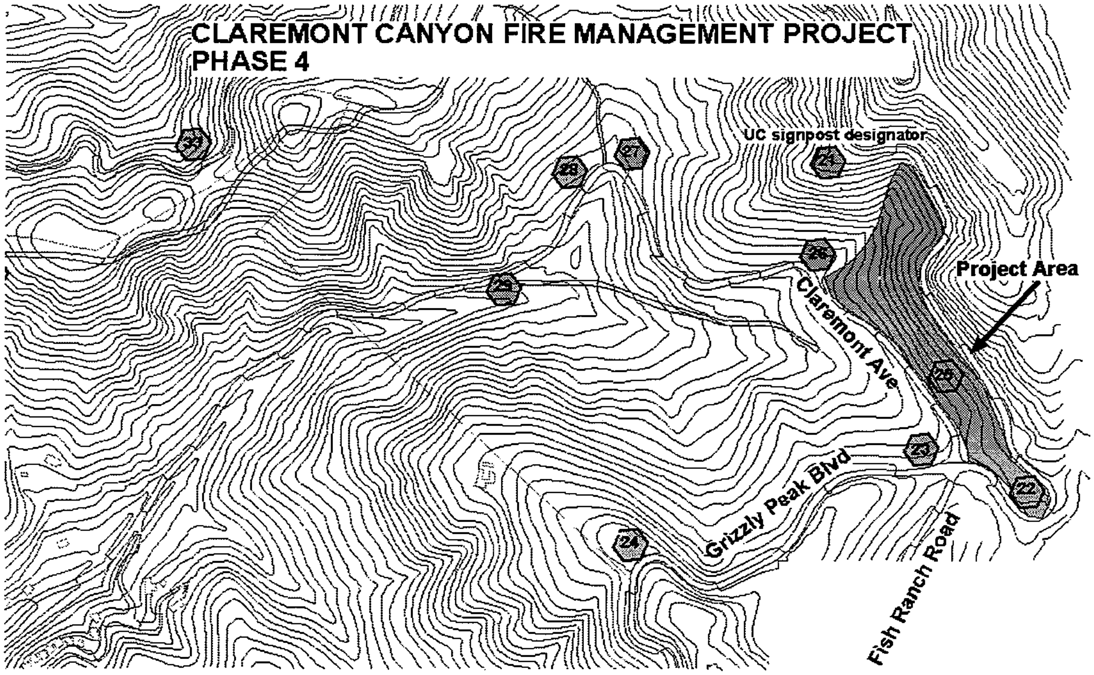
The management strategy promotes a forest conversion: the emerging native forest of California Bay, Oak, Maple, and Hazelnut will be retained and the existing eucalyptus-dominated exotic canopy forest will be eradicated. The native species produce either considerably lesser fuel loads or are most fuel-productive well before the peak of the regional fire season.

During the project, the native understory will be protected as practicable, while the exotic trees will be removed and their stump cambium chemically treated with Garlon 4 to prevent re-sprouting. Felled eucalyptus will be either removed -- most will then be chipped -- or lopped and scattered on the project site. Some removed stems will be recycled as landscape timbers and roadside guardrails in the adjacent lands to the extent practicable. Surplus logs will be used as biomass fuel or as pulp.

Protection of the native species, and ongoing management after project completion as further detailed below, will ensure a successful conversion protective of natural and recreational resource values, including but not limited to habitat, hydrology, soils and geology, and air quality.

All cut tree stumps shall receive annual follow-up treatment of Garlon 4 on any emerging stump sprouts, to ensure the permanent elimination of eucalyptus from the project area. Follow up treatment of resprouts will be conducted until 100% resprout suppression is obtained. The project duration is anticipated to be 6 weeks of vegetation removal work. Follow-up treatment will occur twice annually, and will be conducted as an ongoing maintenance operation.

Prepared by: Tom Klatt, Manager – Office of Emergency Preparedness



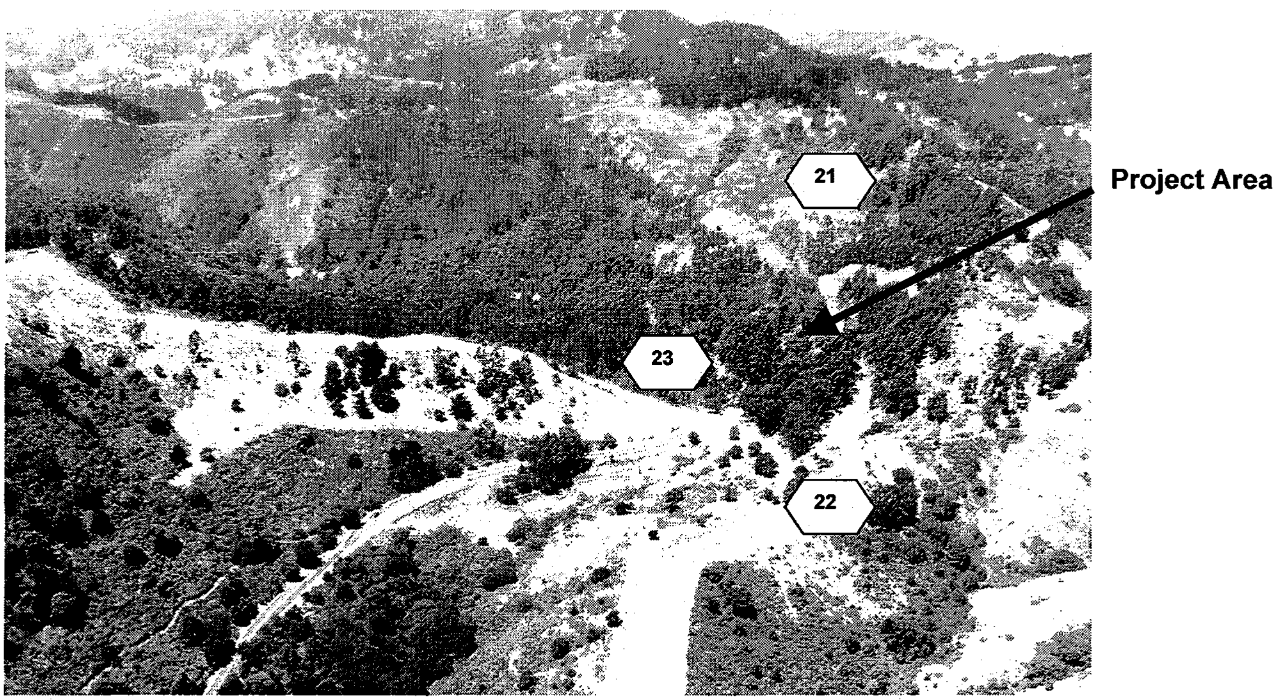


Photo: Courtesy of Peter Klatt

Prepared by: Tom Klatt, Manager – Office of Emergency Preparedness

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Claremont Canyon Fuel Management Project – Phase 5

In an effort cooperatively funded by UC and the City of Oakland this project removed 1000+/- Blue Gum Eucalyptus and Monterey Pine trees in the upper portion of Claremont Canyon. The project area, adjacent to project site executed between 2001 through 2004, is a 5 +/- acre parcel of land adjacent to Claremont Ave, one quarter mile below Grizzly Peak Blvd. The management strategy promoted a forest conversion: the emerging native forest of California bay, oak, maple, and redwood were retained and the eucalyptus/pine dominated exotic canopy forest was removed.

The site was last logged of eucalyptus trees in 1974-75, in an effort funded by FEMA in response to the hard freeze of 1972-73 that killed above ground tree foliage. The earlier logging provided a number of skid roads, which were resurrected in this project to enable processing of the felled timber. In an effort historians attribute to the Rotary Club of Oakland and the UC Forestry Department, many hundreds of Coast Redwood and Monterey Pines were planted in the canyon immediately after the 1975 harvest. The Redwood plantings followed the creek and its tributaries, while the pines were planted in a plantation fashion, approximately 10 feet on center from one another in a grid pattern. Without thinning and management, the pine plantation developed into a tight stand of small, but tall trees (100'), with interconnected canopies. The stand exhibited relative low diversity floral diversity and had few native plants – save for poison oak – growing amongst the trees.

While native trees were protected during harvest, the site held relatively few such trees and many were not salvageable during the harvest of this dense stand of pines and eucalyptus. Cut stems were chipped, with the chips broadcast throughout the project area. During the project, it was determined that chipping of all material would result in a greater depth of retained chips than was desirable. Excess boles were skidded to the signpost 29 landing west of the project area, and will be disposed of as firewood, paper pulp or co-generation plant fuel, as the market allows. In deciding which reuse-market to select, the contractor will determine which best covers the costs of handling and transportation of the material.

For the purposes of bidding, the entire project site was divided into 3 sections, X, Y and Z. The topographical map (below) shows the boundaries of the sections. Bids were solicited for all 3 sections, but budget limitations allowed for only one section, Z, to be undertaken in 2005.

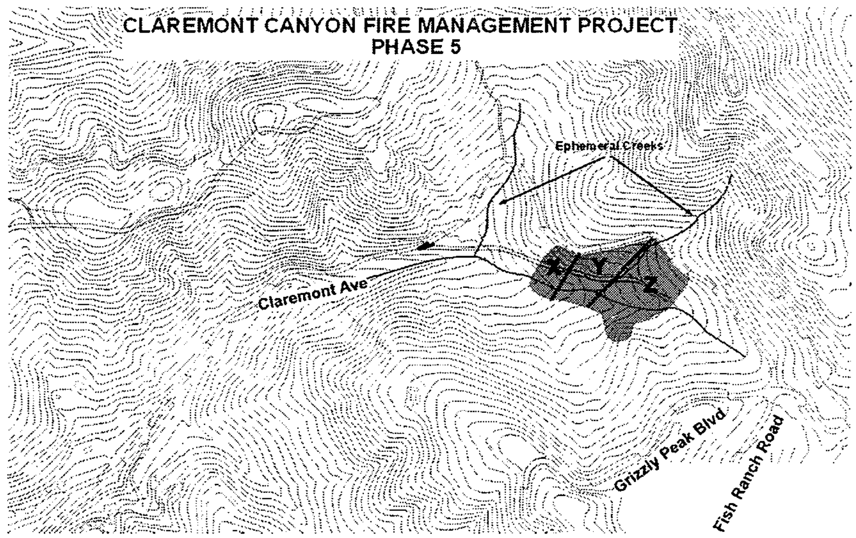
The contractor employed a feller-buncher to fell the trees, and then used a skidder, log shovel and chipper to process the downed material. The feller-buncher, while operating rapidly, posed some difficulties for the project. The high density of trees dictated many, large bunches of downed trees, many of which had to be repositioned before the chipper could be maneuvered into place to allow processing. By necessity, many of the downed trees blocked the fire road and skid trails, so most trees were handled more often that once.

Contractor: Expert Tree Service

1000 stems

5 acres (sec Z only)

$35,000



BEFORE

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BEFORE

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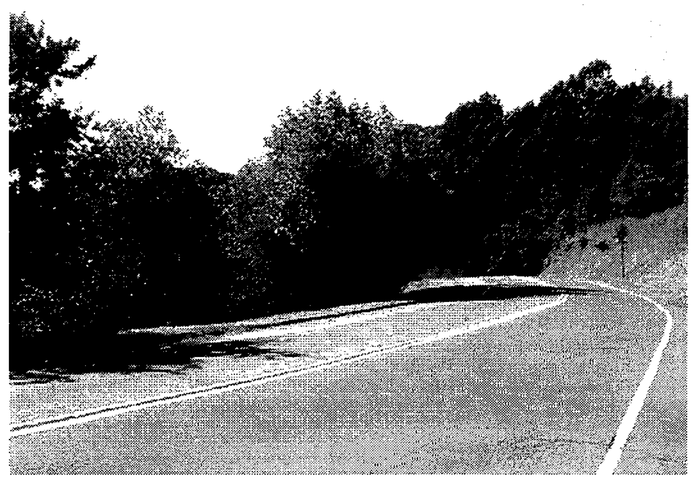
DURING

AFTER



UC Berkeley
FUEL REDUCTION PROJECT:

Claremont Canyon Phase 6 Eucalyptus Removal

C.1 PROJECT SUMMARY

As a component of the wildland fire management program analyzed in the 2020 Long Range Development Plan Environmental Impact Report, this project will remove eucalyptus, pine and acacia trees from a 14 +/- acre parcel of University land adjacent to Claremont Ave, one quarter mile below Grizzly Peak Blvd. In a manner consistent with best practices and mitigation measures identified in the 2020 LRDP EIR (SCH # 2003082131) the project will remove approximately 3200 stems within the 14 +/- acre project boundary (see map attached)

The project location is in a heavily vegetated canyon immediately adjacent to the cities of Oakland and Berkeley, near the site of -- and displaying similar fire risk conditions to -- the catastrophic 1991 Tunnel Fire.

In the project location, the under story is a rich assembly of native tree and shrub species growing beneath a canopy overwhelmingly comprised of re-sprouted eucalyptus and pine trees. The eucalyptus reproduces rapidly from nuts and resprouts, increasing the fuel load and density. Additionally, a small percentage of the canopy assemblage comprises exotic acacia species, which also spread rapidly and produce flammable litter.

The management strategy promotes a forest conversion: the emerging native forest of California bay, oak, maple, and redwood will be retained or augmented while the existing eucalyptus/pine dominated exotic canopy forest will be eradicated. The native species produce either considerably lesser fuel loads or are most fuel productive well before the peak of the regional fire season.

During the project, the native trees will be protected as practicable, while the exotic trees[1] will be removed and their stump cambium chemically treated with herbicide to prevent re-sprouting. Felled trees will be either chipped or retained whole on the project site. Removed stems may be recycled as roadside timbers, retained as habitat, or positioned for erosion control on the project site to the extent practicable and with the concurrence of the project manager.

Protection of the native species, and ongoing management after project completion, will ensure a successful conversion protective of natural and recreational resource values, including but not limited to habitat, hydrology, soils and geology, aesthetics and air quality. Typically, only boles in excess of 24" diameter are selected for whole log retention.

Work will be done on mountainous terrain, which can have slopes up to 45 percent, have varying ground conditions, soil types, and vegetation types. Ground conditions can contain surface and below surface rock, stumps, and other debris that will vary in size, density, and depth.

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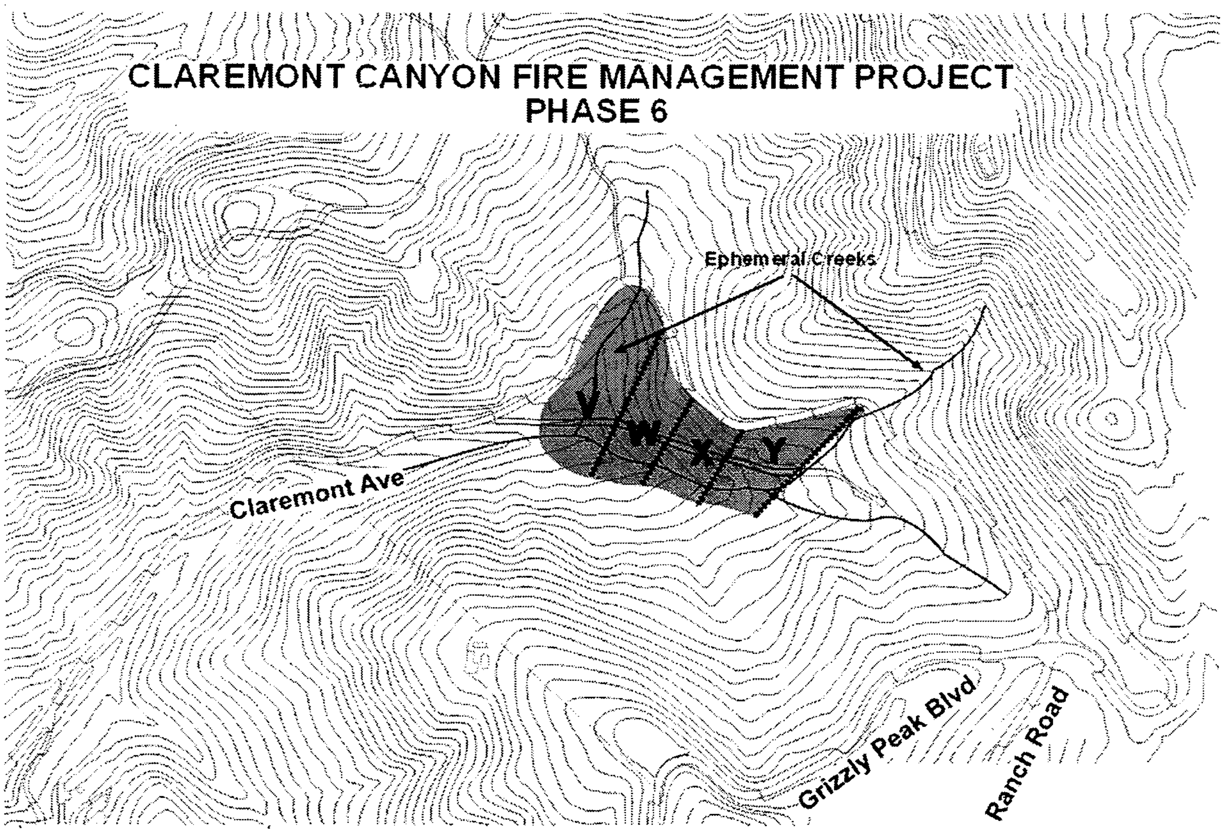
[1] Monterey pine do not require herbicide treatment after felling

C. 2 PROJECT SITE MAP

For the purposes of bidding, the entire project site is divided into 4 sections: V, W, X and Y. The topographical map and aerial photo on the following page show the rough boundaries of the sections. Boundaries will be marked in the field along Claremont Avenue and with survey markers and will be fully covered in the project bid walk. Bids will be solicited for all 4 sections and the project will be awarded to a single contractor, based on the lowest cumulative bid for the chosen sections. Work will be awarded in the following order: Y, X, W, V as funding permits.




V
W
X
Y

PG&E Transmission Line Vegetation Management Project

<u>Project Description:</u>

The project will remove up to 546 eucalyptus and pine trees and adjacent 885 units of brush (1 unit = 275 cubic feet) on University land along the PG&E right-of-way between Grizzly Peak Blvd and the LBNL substation. This right-of-way supports the main 115KV power line that provides electricity to the University and to the Lawrence Berkeley National Laboratory. The project location is the headslope of a heavily vegetated canyon immediately adjacent to the cities of Oakland and Berkeley, near the site of –– and displaying similar fire risk conditions to –– the catastrophic 1991 Tunnel Fire.

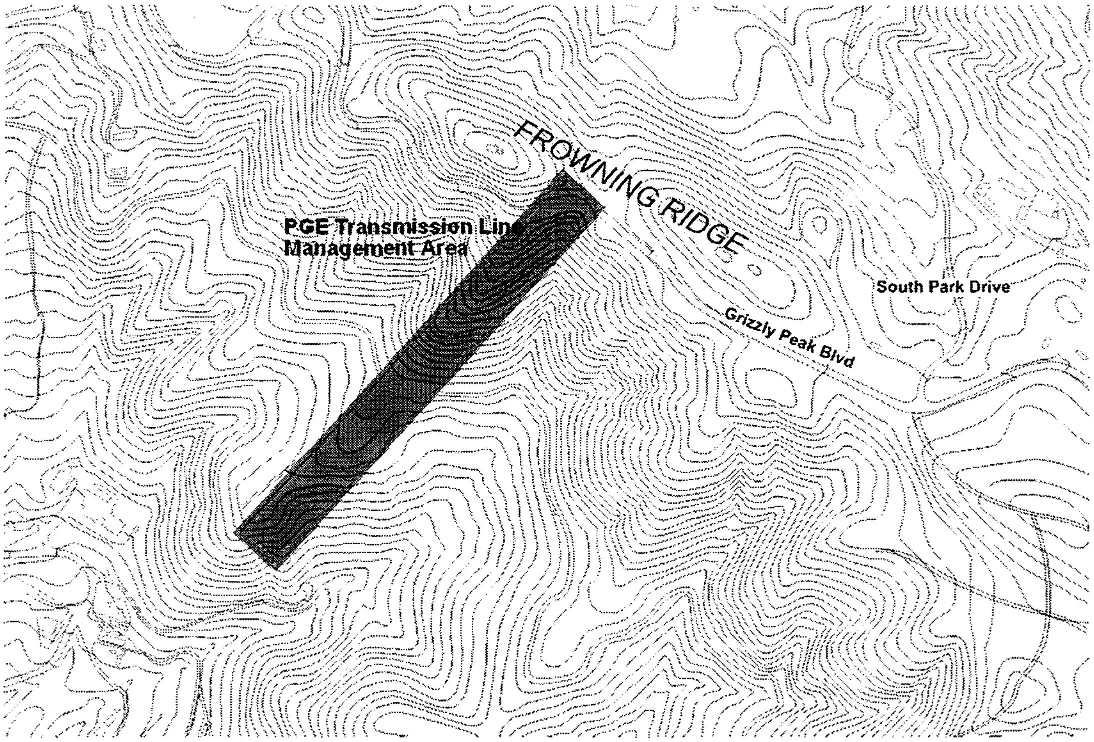
In the project location, the resprouted eucalyptus trees are growing dangerously close to the high voltage lines. As these resprouted trees are structurally deficient and are subjected to high wind velocities, they represent an appreciable hazard.

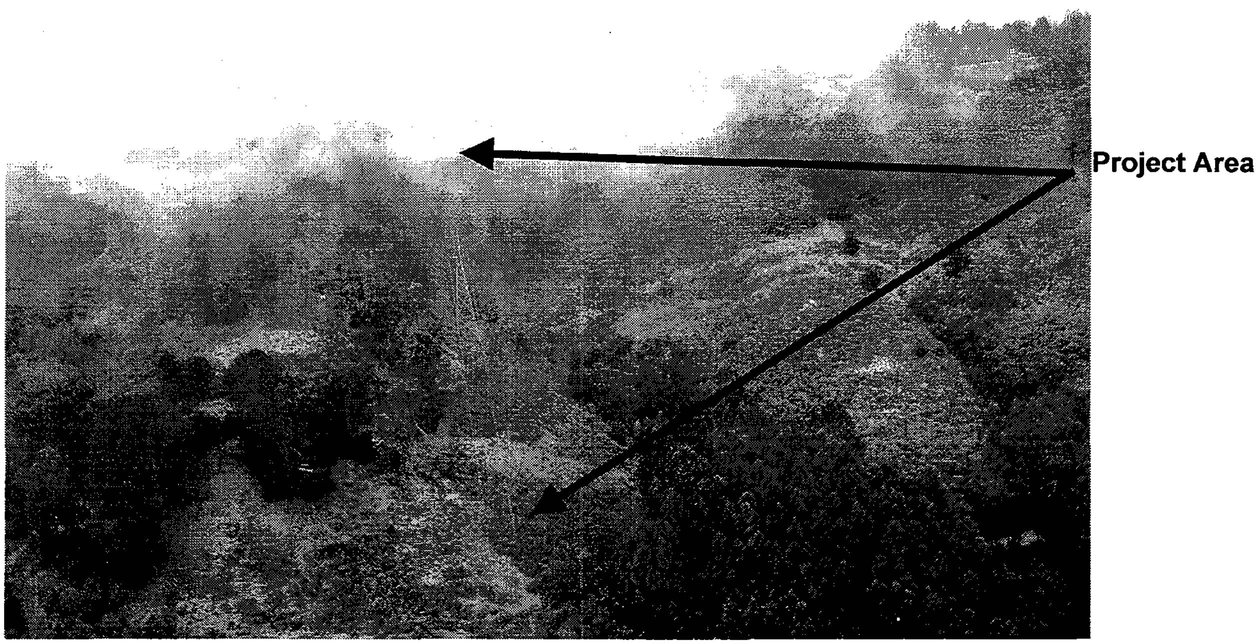
As a component of this management project, the access road to the various transmission towers will be repaired and restored as necessary and practicable in order to facilitate routine maintenance and emergency repairs. A skid trail will be created along the right-of-way in order to remove and process the downed trees.

During the project, the native understory will be protected as practicable, while the exotic trees will be removed and their stump cambium chemically treated to prevent re–sprouting. Felled eucalyptus will be chipped and scattered at the project site or on adjacent University lands. Some removed stems will be recycled as landscape timbers and roadside guardrails to the extent practicable.

Protection of natural and recreational resource values, including but not limited to habitat, hydrology, soils and geology, and air quality, will be maintained by the application of best management practices typical of this type of work and within this locale.

All cut tree stumps shall receive annual follow–up treatment of herbicide on any emerging stump sprouts, to ensure the permanent elimination of eucalyptus from the project area. Follow up treatment of resprouts and seedlings will be conducted until 100% eradication of eucalyptus is obtained. The project duration is anticipated to be 6 weeks. Follow–up treatment will occur at least twice annually, and will be conducted as an ongoing maintenance operation.


FROWNING RIDGE
PGE Transmission Line
Management Area
South Park Drive
Grizzly Peak Blvd


Project Area

FROWNING RIDGE – PHASE 3 FUEL REDUCTION PROJECT

UNIVERSITY OF CALIFORNIA, BERKELEY 2004

C.1 PROJECT SUMMARY

This project will remove Blue Gum (eucalyptus) trees, west of Grizzly Peak Blvd adjacent to the PG &E 115Kv transmission line. The project will remove all *Eucalyptus* trees (210+/- stems) within the project boundary. The management strategy promotes a forest conversion: the emerging native forest of California Bay and Oak, will be retained and the existing eucalyptus-dominated exotic canopy forest will be eradicated.

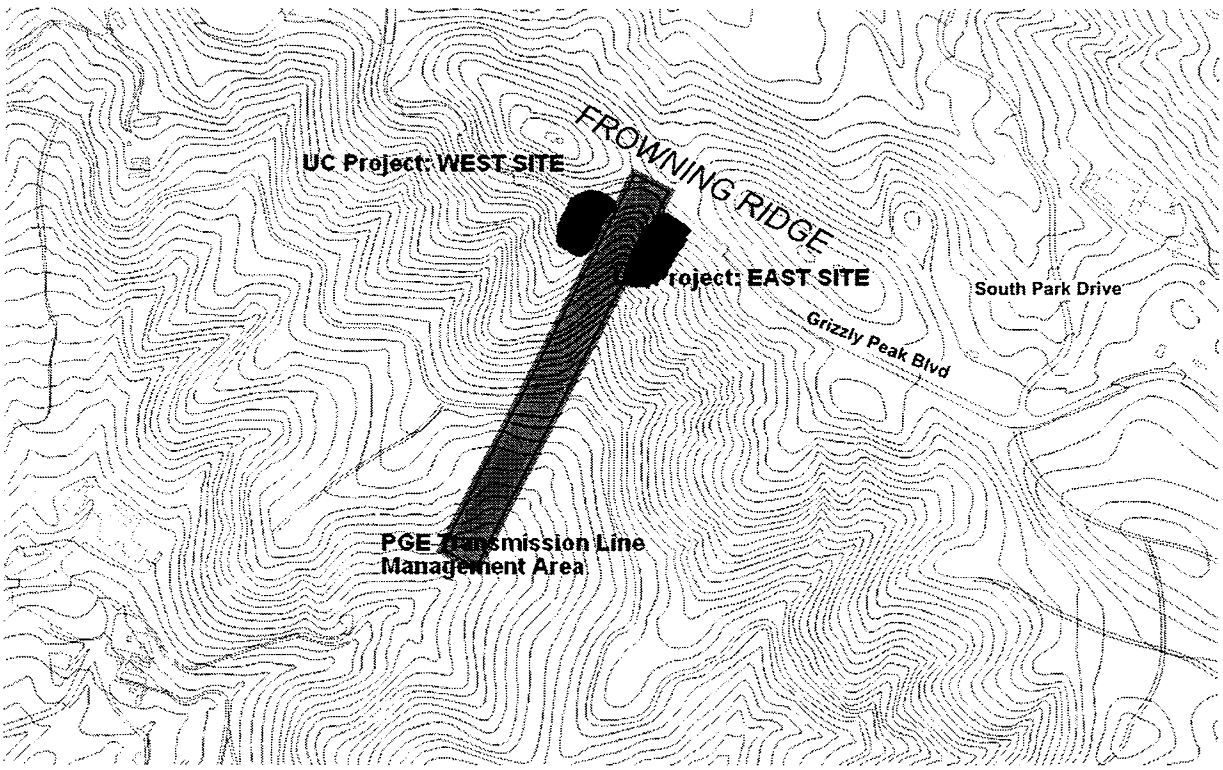
During the project, the native trees will be protected as practicable, while the exotic trees will be removed and their stump cambium chemically treated with herbicide **(Imazapyr, isopropylamine salt)** to prevent re-sprouting. Felled trees will be chipped and scattered on the project site.

Protection of the native species, and ongoing management after project completion as further detailed below, will ensure a successful conversion protective of natural and recreational resource values, including but not limited to habitat, hydrology, soils and geology, and air quality.

Work will be done on mountainous terrain, which can have slopes up to 45 percent, have varying ground conditions, soil types, and vegetation types. Ground conditions can contain surface and below surface rock, stumps, and other debris that will vary in size, density, and depth. Vegetation types vary in size and density and include eucalyptus, oak, pine, poison oak, French broom and coyote brush (*Baccharis* spp.)

As an ongoing maintenance operation, all cut eucalyptus tree stumps shall receive annual follow up treatment of Garlon 4, Stalker or Chopper on any emerging stump sprouts, to ensure the maximum percentage of eucalyptus elimination from the project area. Follow up treatment (not included in this contract) will occur continuously after completion of initial removal by contractor.

C. 2 PROJECT SITE MAP



Stem Count: West Portion of Site: 160 +/- stems

East Portion of Site 50 +/- stems

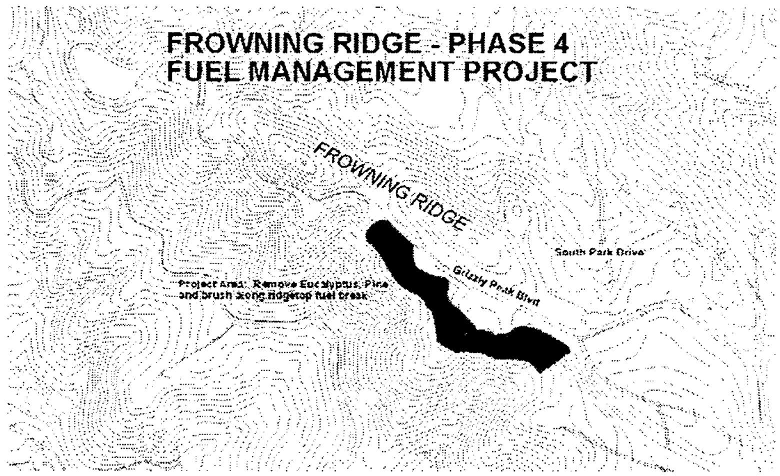
Total: 210 +/- stems

Contractor: Reliable Tree Experts

1900 trees, 5 autos removed

11 acre project site

$68,000



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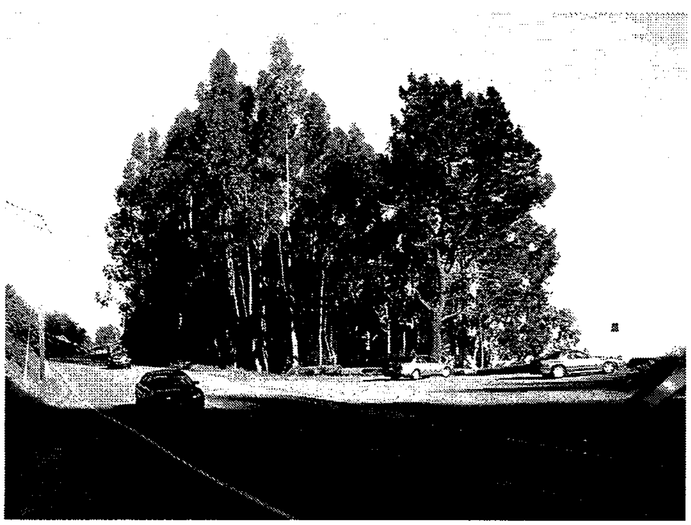

AFTER

BEFORE

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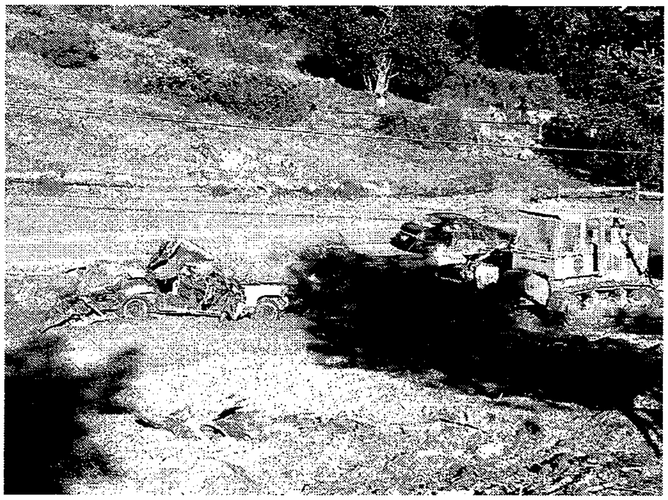
BEFORE

AFTER

RECOVERED WRECK



RECOVERED WRECK

RECOVERED WRECK

Frowning Ridge Fuel Management Project – Phase 4

In an effort cooperatively funded by UC and the City of Oakland this project removed Blue Gum Eucalyptus and Monterey Pine trees, west of Grizzly Peak, between the PG&E 115Kv transmission line and South Park Drive. The project was a continuation of an effort that began in 2004, which included projects by East Bay Regional Park District (East side of GBP), the City of Oakland (GPB ROW) and UC (West side of GPB).

The project removed 1900+/- stems within the 11+/- acre project boundary. The management strategy promoted a forest conversion: the existing and emerging native California Bay and Oaks, were retained and the eucalyptus-dominated exotic canopy forest was eradicated. A number of larger pine trees were retained to serve as raptor habitat, although many more were retained than necessary due to financial constraints. Overall canopy cover in the project area was reduced significantly in order to favor a larger coverage of grasses, forbs and shrubs, representing a safer fuel type for this strategic ridgeline. Additionally, the southern aspect exposure of this steep and rocky slope may eventually provide very suitable habitat for the endangered Alameda Whipsnake. Certainly, the project will better enable migration of the Whipsnake and the connection of isolated Whipsnake habitats in the USF&W unit 6 and unit 1 recovery zones.

During the project, the native trees were preserved, while the exotic trees were removed and their stump cambium chemically treated with herbicide to prevent re-sprouting (only eucalyptus requires stump treatment). All trees were felled by hand, and were skidded to one of two landings sites along Grizzly Peak Blvd. Felled trees were either chipped or retained whole on the project site. Removed stems were primarily placed and retained as habitat, vehicle barriers, or positioned for erosion control on the project site. At the lower boundaries of the project sites, cut trees were mulched in a lop-and-scatter technique, and retained near to where they were felled. This approach was used in order to achieve several benefits: creation of faunal habitat, erosion control, disturbance minimization and cost efficiency.

The work area is best characterized as extremely mountainous terrain, with slopes up to 75 percent. The project area along Grizzly Peak Blvd contains several vista parking areas and is frequently visited due to the spectacular vistas provided of the San Francisco Bay Area. The net effect of removing the large number of tall, exotic trees was to substantially enhance and broaden the view corridor along both the roadway and at the vista overlook turnouts.

As a component of the work, the contractor retrieved five abandoned autos from the project area. These wrecks had been deposited years earlier, by miscreants who pushed stolen automobiles over the cliff at the nearby vista turnout. Log barriers, placed in 2002, now prevent wrecks from being pushed over the cliff at the turnouts. The City of Oakland tow contractor, A & B Vehicle Processors, handled the wrecks once they were pulled up the cliff to the roadside by bulldozer.

PUBLIC INFORMATION

UC Berkeley Fire Fuel Management
BRONTOSAURUS PROJECT:
FROWNING RIDGE/CHAPARRAL HILL

Overview:

The University of California, Berkeley is conducting a fuel management project beginning on March 1, 2004. Vegetation will be cleared in the Frowning Ridge/Chaparral Hill area to increase fire safety using equipment known as a "Brontosaurus" (see map - reverse). The "Brontosaurus" is a large cutting head mounted on a tracked caterpillar, which removes and chips, brush and small trees as a single operation. Trees up to 12" in diameter are mulched in place and the chips spread by the equipment. A follow-up treatment with a growth inhibitor, Garlon 4, to individual stumps, will ensure that the removed eucalyptus trees do not re-sprout from their roots.

Removal of non-native trees and underbrush to improve wild-fire safety in the hill area is carefully planned to remove only what is necessary. The current project focuses on the removal of re-sprouted Blue Gum Eucalyptus (*Eucalyptus globulus*). The eucalyptus trees were first cut down in 1973, and then again in 1986, but have re-sprouted and grown to heights approaching 85 feet. These trees pose an extreme fire risk because of their ridge-top location and the propensity of the trees to cast burning embers for miles in the event of a fire in the canopy. The project will also remove some non-mature Monterey Pines (*Pinus radiata*), along with Coyote Brush (*Baccharis pilularis*) and Poison Oak (*Toxidendron diversilobum*), around the base of the trees.

The grinding process should not harm any burrowing animal. The heavy vibration of the equipment, coupled with its lumbering pace, provides wildlife ample warning to move elsewhere during operations. The site has been surveyed for nesting raptors and reptiles, and a wildlife biologist is assisting in project monitoring and mitigation measures. The overall impact of the project will be to reduce wildfire risks and enhance wildlife habitat, particularly for the endangered Alameda Whipsnake and for several species of raptors.

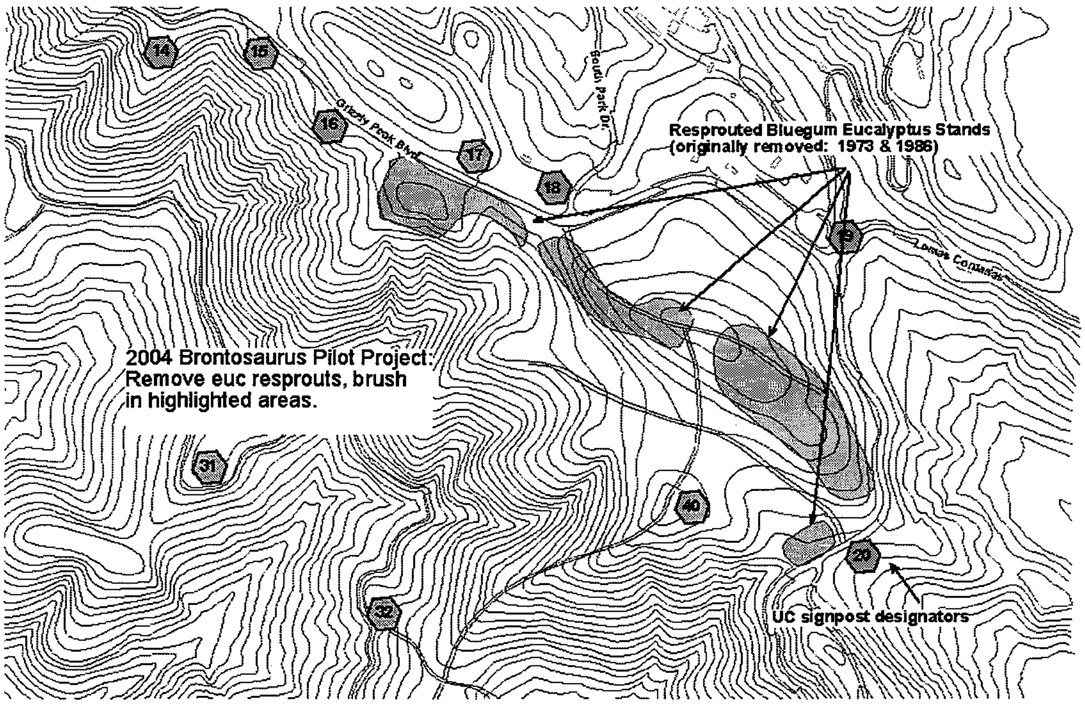
The project duration will be about one week (weather permitting) and work will take place from 7am – 5pm. The project team will adhere to regulations concerning safety, dust, dirt, exhaust fumes, and storm water runoff. If you have questions or concerns about the health and environmental impacts of campus construction, please contact UC Berkeley's Office of Environment Health & Safety at 642-3073.

The work is being coordinated with regional public landholders and cities represented on the ***Hills Emergency Forum***: Cities of Oakland, Berkeley, El Cerrito, East Bay Regional Park District, East Bay Municipal Utility District, Lawrence Berkeley National Laboratory, UC Berkeley and California Department of Forestry and Fire Protection. Project planning has also included the Claremont Canyon Conservancy, the US Fish and Wildlife Service, and the California Department of Fish and Game.

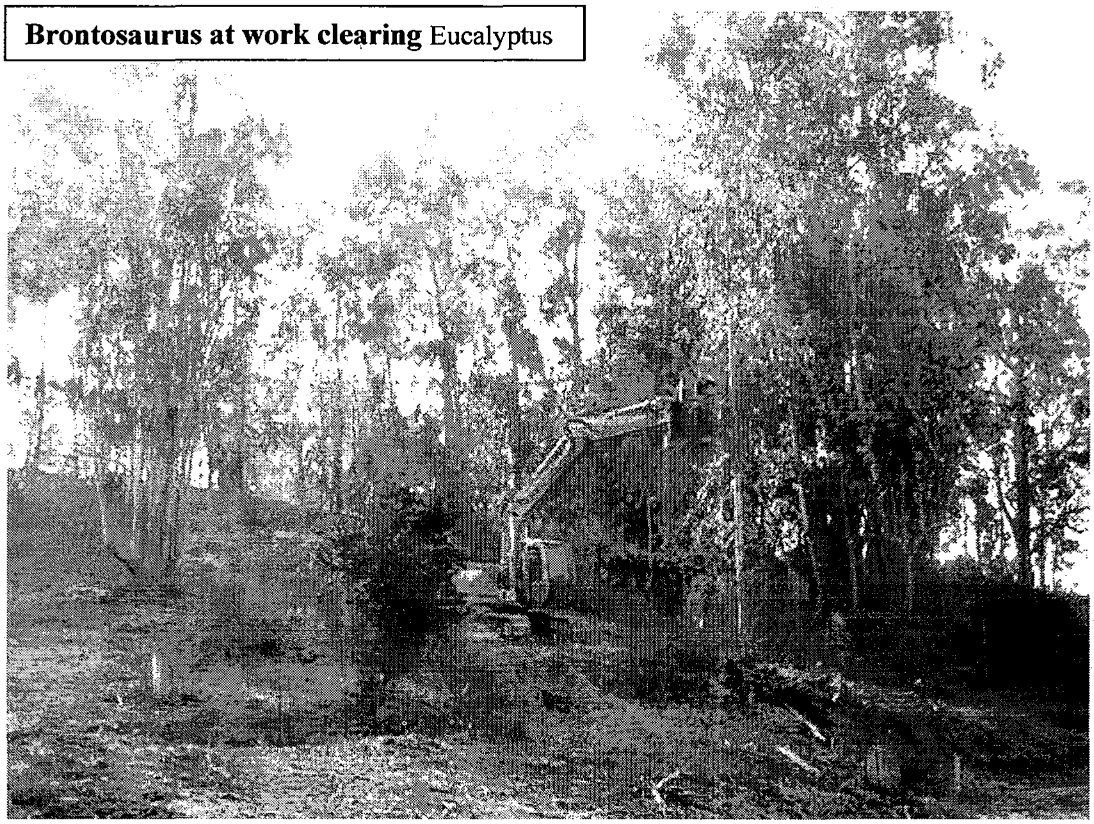
The University of California, Berkeley Fire Mitigation Program is providing funds for this work. For additional information, please contact Tom Klatt, Manager – Emergency Planning and Fire Mitigation (642-1258 or tklatt@berkeley.edu)

PUBLIC INFORMATION

Project Location:



Brontosaurus at work clearing Eucalyptus



UC Berkeley Fire Fuel Management
BRONTOSAURUS PROJECT:
FROWNING RIDGE/CHAPARRAL HILL
March – April 2004

PROJECT REPORT

Overview
The University of California, Berkeley conducted a fuel management project within its Hill Campus during the period March – April 2004. Vegetation in an area of approximately 25 acres was cleared in the Frowning Ridge/Chaparral Hill area to increase fire safety using equipment known as a "Brontosaurus" (see map below). Chaparral Hill is the up-slope head of a side ridge (Panoramic Ridge) running perpendicular to and westward from, the higher, roughly north-south-running East Bay Hills and the adjacent Vollmer Peak. Frowning Ridge is an adjacent portion of the East Bay Hills just north of Chaparral Hill and represents the saddle between Vollmer and Grizzly Peaks.

The project focused on the removal of re-sprouted Blue Gum Eucalyptus (*Eucalyptus globulus*). The eucalyptus were imported and planted for unrealized lumber potential during the 1840s-50s Gold Rush and again planted by UC Berkeley students during 1920s forestry experiments. A 1973 freeze killed almost all eucalyptus trunks, branches and foliage. The mass of dead aboveground fuel posed a severe fire risk at that time, and the trees were logged. This species of eucalyptus resprouts prolifically, however, and – on this project site -- were logged in 1986, but have yet again re-sprouted and grown to heights approaching 85 feet. In adjacent areas where the 1970s resprouts were not re-logged in the 1980s, they typically reach heights of 120 feet or more -- more than double the growth of native redwoods planted in 1973 after the freeze. The allelopathy of eucalyptus saps, combined with their shadowing height and density, offer severe competition to chaparral, oak woodland, and other endemic habitats.

These eucalyptus pose an extreme fire risk due to their ridge-top location in this region's annual Diablo (foehn) wind climate -- and also to the propensity of the long-lasting but light-weight peeling bark and leaf duff to transport for up to 3 miles in canopy-fire winds as burning embers.

The project also removed some 45 non-mature Monterey Pines (*Pinus radiata*), along with understorey and adjacent Coyote Brush (*Baccharis pilularis*) and Poison Oak (*Toxicodendron diversilobum*).

The main removal tool employed was the "Brontosaurus" -- a large masticating head mounted on a tracked caterpillar, which removes, chips, and scatters brush and small trees up to 12" diameter at breast height (dbh) as a single operation. A follow-up application of the growth inhibitor, Garlon 4, to individual stumps ensured that the removed eucalyptus trees will not re-sprout from their roots. Conventional tree felling crews and log chippers followed to remove and mulch stems too large for the Brontosaurus technique.

Just prior to the project action, the site was surveyed for nesting raptors and reptiles. During the project, a wildlife biologist monitored the project actions and incorporation of biologist-prescribed mitigation measures.

The project duration for the Brontosaurus was one week (83 equipment hours). Approximately 13 acres of brush and 850 tree stems were removed (stem size 3" to 12" dbh). The project duration for the hand-crews was two weeks, and included the removal of 550 additional stems.

Results

The Brontosaurus is extremely well suited to the rapid removal of dense brush and small trees. The equipment, however, had difficulty with eucalyptus trees larger than approx. 10" dbh, and with dense stands of trees on slopes over 20%. The eucalyptus trees comprise much harder wood than pines and firs, and -- while the Brontosaurus could grind the larger stems -- the process was slow. On the second day of work -- when the two machines were working exclusively on eucalyptus removal --, both machines experienced mechanical failures and the workday was cut short. The failures included overheating and broken or leaking hydraulic lines – a concern for both regional water quality and habitat health. When large stems are felled, the crown can fall onto the equipment and damage the exposed hydraulic lines.

In order to maximize the productivity of the machines and cut down on equipment failure, we altered the work plan to move into areas with a mix of smaller trees and brush, such that the equipment would have a mix of brush and tree work – rather than the continuous tree chipping that leads to mechanical failures. Additionally, the on-site reptile biologist was concerned about the rocky outcroppings – known to harbor a small Threatened Alameda Whipsnake population -- on the south facing slopes of Chaparral Hill, and constrained the work to avoid disturbing that habitat. This constraint rendered those work areas a less desirable target, as we would have had to leave many trees and could take only a small amount of brush. Additionally, the eucalyptus trees on this slope were larger than the Brontosaurus could effectively handle.

As an alternate work plan, and in consultation with the consulting biologist, the equipment was redirected to the adjacent northern slopes of Chaparral Hill. On those sites, we were able to take a large amount of brush and a large number of smaller stems. Several hundred yards of extant road-width trail there were lightly restored by blading, enabling follow-up Brontosaurus work to continue with stem removal.

The Brontosaurus productivity is calculated as follows:

Element	**Amount**	**Rate**	**Extended**
Brontosaurus Work	83 hours	$175/hr	$14,525
Mobilization	13 hours	$85/hr	$1,105
Consultations - WS	35 hours	$100/hr	$3,500
Consultations - Raptor	10 hours	$30/hr	$ 300
Planning	32 hours	$87/hr	$2,840
Treatment	10 gallons	$120/gal	$1,200
PM/Contract Admin	No Direct Charges	-	-
		TOTAL	**$23,470**
Unit Costs			
Brush Clearance	25% of project	$5870	

Tree Removal	75% of project	$17600	
Productivity			
13 Acres Brush	@ $ 5870	**$451/acre**	
850 stems	@ $17,600	**$ 21/stem**	
Conventional Felling			**$17,115**
550 Stems		**$31/stem**	
Stump Grinding	$1200/day	2 days	**$ 2,400**
		TOTAL	**$42,985**

Next Steps

The project created a 2,500-foot-long ridge top fuel break between 50 and 200 feet in width. Brush in this break was removed to grade – we anticipate naturally occurring restoration of native understorey and chaparral from extant seed-banks --, but 550 eucalyptus trees too large for the Brontosaurus remained in the area after the Brontosaurus work concluded. Follow-up work in this area will focus on the following objectives:

1. Maintain the access paths and cleared areas free from poison oak and limit the size of the brush. The extreme amount of Poison Oak (*Toxicodendron diversilobum*) makes this area a hazardous work location and serves to prevent maintenance. Apply Garlon4/Roundup to the emerging Toxicodendron foliage to eradicate this plant along necessary maintenance paths. Use wood chip mulch to suppress growth along access corridors and staging areas to the extent the material is available.
2. Retreat with herbicide all eucalyptus trees resprouting from cut stumps or emerging from seed stocks.

UC Berkeley is entering a process of identifying ideal regional vegetation palettes to inform thoughtful habitat restoration and to combat invasive species. Poison oak control will likely require some balance; to be determined, between maintaining healthy endemic ecosystems and providing safe access for continued fire fuel management. It is understood that human intervention in areas with dense poison oak stands is necessarily limited and potential dangerous and unhealthy.

Observations and Findings

Conclusions Regarding Productivity

The Brontosaurus is most productive in areas requiring heavy brush removal and containing eucalyptus stems, if any, of generally less than 10" dbh. Eucalyptus is a very hard wood, and the equipment was severely taxed while grinding the lower portions of these large, hard stems. Soft wood species being much easier to grind, Brontosaurus stem size capability is larger for pine and fire forests.

The equipment can work on slopes to 30%, but work is slower as the slope increases and tree stand density increases. The Brontosaurus needs to adjust its position constantly to account for the directional fall of the tree crowns, which becomes increasingly difficult and time-consuming on steep slopes.

Greatest overall productivity can be achieved by using a chainsaw crew in conjunction with the Brontosaurus -- where trees could be felled by saw, then chipped by the Brontosaurus. The Brontosaurus is especially useful for clearing a path to tree stands, thus minimizing poison oak exposure and allowing truck and chipper access directly to work areas. The tree contractor who executed the second phase of tree removal work indicated that his bid of $31/stem for felling and chipping eucalyptus trees could be that low because the trees were easily accessible after Brontosaurus clearing. Without the Brontosaurus work proceeding the conventional felling, we would have expected a per stem cost of $60 - $70. Because the poison oak and other brush can reemerge rather quickly, it is recommended that in future Brontosaurus projects, conventional felling be scheduled to follow closely after brush-and path clearing.

Timing of Work:
The best time for conducting the Brontosaurus in the grater Bay Area is in late fall or early winter. There are several issues and constraints that need to be accommodated, some in conflict with others:

- **Reptile impact** (including Threatened Alameda Whipsnake). It is least detrimental to reptiles if the work is done during their hibernation season, from early November to mid-February. By early March (when this pilot project was performed), snakes were beginning to emerge from their burrows, thus increasing the possibility of unintentional "take".
- **Water/soil issues.** To minimize soil disturbance and damage to fire roads, it is best to work outside of the rainy season. While local loamy clay soils dry out reasonably quickly, a small amount of rain creates thick, slippery mud -- and vehicles driving upon the wet roads leave deep grooves. While the Brontosaurus treads actually helped to remove the vehicle grooves, the slippery trails required that the Brontosaurus be driven to the staging area each day for refueling, rather than bringing the refueling trucks to the Brontosaurus. Sedimentation and runoff were not issues, due to the headslope location of the work site, the absence of any creeks in the area, and the extensive amount of vegetation down-slope, which served to filter the minimal muddy runoff produced by the project. No comparative studies have been designed to assess the differences on soil compaction and erosion impacts of different logging methodologies for UC Berkeley sites. While the Brontosaurus is reported to spread its load over the area of its tracks such as to minimize disturbance, the operation of the Brontosaurus must be considered in the context of overall soil impacts of felling and clearing by this method. Other factors include: impacts as felled trees are moved into position for masticating; impacts of brush removal on soils and slope retention; impact of leaf canopy removal (increases percentage of unintercepted precipitation that erodes soils upon impact). The U.S. Fish and Wildlife Service might benefit through funding a scientific study to assess and compare different fuel removal methodologies, as well as comparing those techniques with prescribed fire options.
  Raptor nests. A large number of raptors (hawks, eagles, kestrals, falcons and owls) are known to exist in the area, and care needs to be taken not to disturb nesting activities, which occur between mid-March and late-July. Fortunately, the eucalyptus resprouts are known to be poor nesting habitat, due to insufficient branching structure and very hard trunks, which are resistant to nesting voids. However, there were several large, decadent pines in the area which were potentially good nesting trees -- so care must be taken not to disturb these trees during the

nesting months. UC Berkeley has recently engaged a pre-project survey process to ensure that raptors and bat species of concern – as well as migratory birds – are not disturbed during nesting season by any campus projects.

- **Fire Safety.** The grinding action of the Brontosaurus creates the potential for an accidental ignition caused from a spark. It would be best to not conduct Brontosaurus work during high fire days, which typically occur in September and October. Precautions can be taken to address ignition potential, but the risk cannot be lowered to zero. Therefore, all contracts should include a requirement that the contractor maintain reasonable types and quantities of "First response" fire-fighting tools and retardant – and that the contractor demonstrates that crews have had useful "first response" training.

By conducting this type of project in late fall, potential impacts to raptors, reptiles and fire risk are eliminated or greatly reduced, leaving only precipitation impacts on soil erosion as the primary environmental concern to be addressed.. The Brontosaurus produces its own mulch as it works, providing an immediate soil protection source. On start-up of a project, trail blading and pre-covering with mulch brought in by light trucks of trails to be used can reduce potential impacts of Brontosaurus movement. Nonetheless, the Bay Area does not typically receive heavy rains in the November through February window, so on average, this time frame seems to be best.

<u>Follow-up Work</u>

The eucalyptus trees and brush removed in this project have been removed in the past (1973, 1986), then grew back, due to a lack of follow-up maintenance. The re-sprouted stems are actually a worse vegetative condition than the original trees, from a fire management standpoint. The multiple, smaller stems create more flammable litter than a single, large stem, and the typical shape of the resprout stands tends to hold the light branches and bark in a basket high above the forest floor. This contributes to the potential for ground fires to move into the canopy, producing a more severe, higher spread risk fire type. The multiple stem structure also promotes a larger amount of leaves and small branches in the canopy, creating a more volatile fuel-air matrix.

To continue the fire management benefit of the work, the removed trees should be prevented from resprouting, undesired tree seedlings eradicated, and the brush growth managed in perpetuity. The initial and proper application of Garlon4 should ensure that a substantial number of stems do not resprout. Garlon4 approaches a 70- 80 % kill rate if applied correctly immediately after stem removal. Follow up treatments to those trees that still resprout is required for 3 – 4 years after the initial cut.

Garlon4 may be applied to the foliage or to the cut stems; both methods appear to be successful. Garlon4 should be applied on days where wind speeds are less than 10 miles per hour and should be applied only to the target plants; applications to comply with all other California State pesticide use regulations and safety requirements.

To allow follow-up management of stems, the native poison oak in the area must be kept under control. The vast patches of poison oak, which grows to heights of over 10 feet, provide a natural barrier to human management. Most people have a sensitivity to poison oak and cannot venture into these areas without contracting urushiol poisoning. The United States Department of Agriculture estimates that there are more than 2 million cases of poison ivy/oak poisoning each year. According to the United States Mine Safety and Health Administration, "urushiol poisoning is the greatest single cause of Worker's Compensation claims in the U.S." The American Medical Association estimates that poison oak is responsible for 50% of all workers' compensation cases in

California. These poisonous plants account for more than 1/3 of a million lost workdays every year. For this reason, -- but recognizing the habitat and food chain roles of Poison Oak, it is recommended that the poison oak be controlled with Garlon4 or another agent. Additionally, several key skid roads should be maintained indefinitely, to facilitate active vegetation management and to allow fire-fighter access for response to a wildfire.

As a follow up on this project, brush and poison oak will be managed by both herbicide application and mechanical treatment, and the eucalyptus resprouts and seed sprouts will be removed until this species is eradicated from the study area. Additionally, wood chips will be imported to serve as a growth –suppressing mulch, as an alternative practice to minimize chemical use. Due to the more-than-century-long presence of eucalyptus in the central and northern California regions, the eucalyptus seed bank is well developed and will require long-term eradication or control efforts. The efficacy of various treatment methods will be analyzed and these results will guide future efforts.

Herbicide Application

In order to increase the effectiveness of the herbicide application, the label instructions for Garlon4 recommend that the material be applied at full strength to the cambium layer of the stump, as soon as possible after the initial radial cut. A blue dye is added to the herbicide in order to ascertain which stems have been treated and to identify the treated area. In the pilot project, the Brontosaurus process tends to leave the stumps partially shredded, making the careful application of Garlon4 somewhat problematic. On the first day, the removed stems immediately South of signpost 18 were treated with 100% Garlon4. By applying material with a low-pressure spray stream, the rate of herbicide use appeared to average around 2 fluid ounces per stem. This averages out to treating 64 stems per gallon, which was deemed economically unsatisfactory. For the remainder of the project, the Garlon4 was diluted with 70% diesel fuel as an adjuvant and approximately 3 fluid ounces per stem were applied. This practice extended the Garlon4 to cover 140 stems per gallon. Follow up inspections will compare the efficacy of these two approaches and future work will be guided by these results.

Because the Brontosaurus process creates a large amount of mulched material near the stumps, only the large stumps are readily identifiable for Garlon4 application. The smaller stumps, under 5" diameter, get ground to soil level and are covered up in a mix of wood chips and poison oak debris, making the location of these small stumps a risky proposition. The missed stems will be treated if and when re-sprouts emerge, revealing their location.

Habitat Benefit

The Brontosaurus work appears to have contributed positively to the diversity and quality of habitat in the project area. With the clearance of the eucalyptus, stands of mature brush are directly adjacent to open areas of low brush and emerging grasses. 6 weeks after the work, observation of the newly cleared areas reveals noticeable wildlife activity and presence of a variety of lizards and snakes. These lizards and snakes (rattlesnakes, gartersnakes) have been observed in the cleared areas, which were previously not suitable reptile habitat due to the lack of sunlight penetration to ground level. Now, reptiles are able to "sunbathe" and thermo-regulate at ground level, immediately adjacent to burrows and hiding places. Deer have also been spotted grazing in the recently cleared areas, and scat thought to come from a fox species has also been identified.

Several species of raptors, including the Northern Harrier, Cooper's Hawk, Red-shouldered Hawk, Swainson's Hawk and Red-tailed Hawk are found in and around the project area. Both during and after the clearing – even while the Brontosaurus was grinding trees--, hawks were seen circling overhead and even perching on 20 tall tree stumps that remained from the grinding process. It appeared that the 20 year old eucalyptus trees were not suited as perches, but the sheared off snags were ideal. As a result, we left several 20 foot tall snags as raptor perches, used while the birds were hunting for ground prey. Continued Garlon4 application will be required to ensure that these stems do not sprout – it was not possible to apply herbicide effectively because of the height of the cut. A methodology will need to be developed for applying the Garlon4 and keeping birds off those snags until the Garlon4 has ceased to be toxic.

While no Alameda Whipsnake specimens have been identified in the project area, the newly cleared land has some potential for colonization – although rocky outcroppings are in evidence only on a small portion of Chaparral Hill's south-facing upper slopes. The long-term suitability of the land for reptile habitat will rest with the permanent eradication of the eucalyptus and the periodic removal and thinning of brush. Allowing the brush to grow higher than 8 feet, completely shading the ground, would seem to have a detrimental impact on the land as reptile habitat. While the Whipsnakes are able to climb tall Chaparral, their main food source, the Western Fence lizard, does not. Continued light maintenance work and limited application of herbicide should be effective as long-term maintenance measures.

In order to increase the habitat value of the treated sites, a small number of downed stems were left on the ground. The crown of these trees was chipped, and the largest portion of the stems was left. These logs, which should last for several decades as they slowly decay, provide a hibernation and nesting habitat for a variety of snakes, lizards, newts and salamanders – as well as for small rodents, mammals, and birds. Surveys by the project herpetologist revealed many specimens in the project area, with many locations hosting more than one species of animal.

Whipsnake Habitat – USFWS Permitting

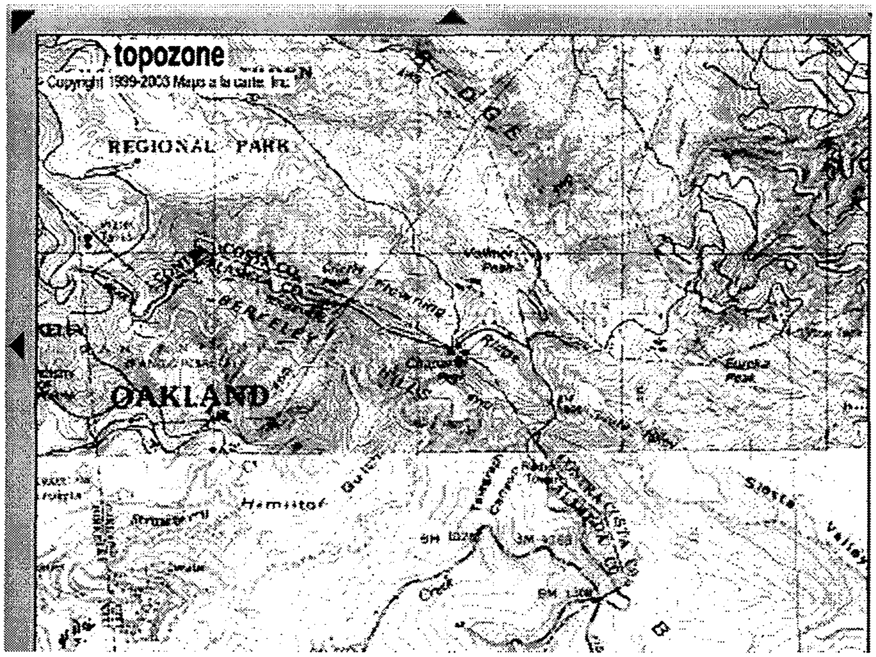
In order to take advantage, in very constrained budget times, of the immediate availability of a brontosaurus contractor in the area, this project could not have occurred had it applied for a Section 10 consultation from the US Fish and Wildlife Service and received a permit to cover any incidental take of Alameda Whipsnakes. The permit process could have taken several years, cost many tens of thousands of dollars in planning and wildlife surveying, and could have necessitated the formulation and adoption of a Habitat Conservation Plan (HCP). Such a plan would have mandated and specified management actions over the course of several decades towards protecting and enhancing the work area as Whipsnake habitat. While an HCP may prove a desirable tool in the future for addressing multiple species concerns, the Section 10 approach to fire fuel management is, from a fiscal standpoint, a poor management choice.

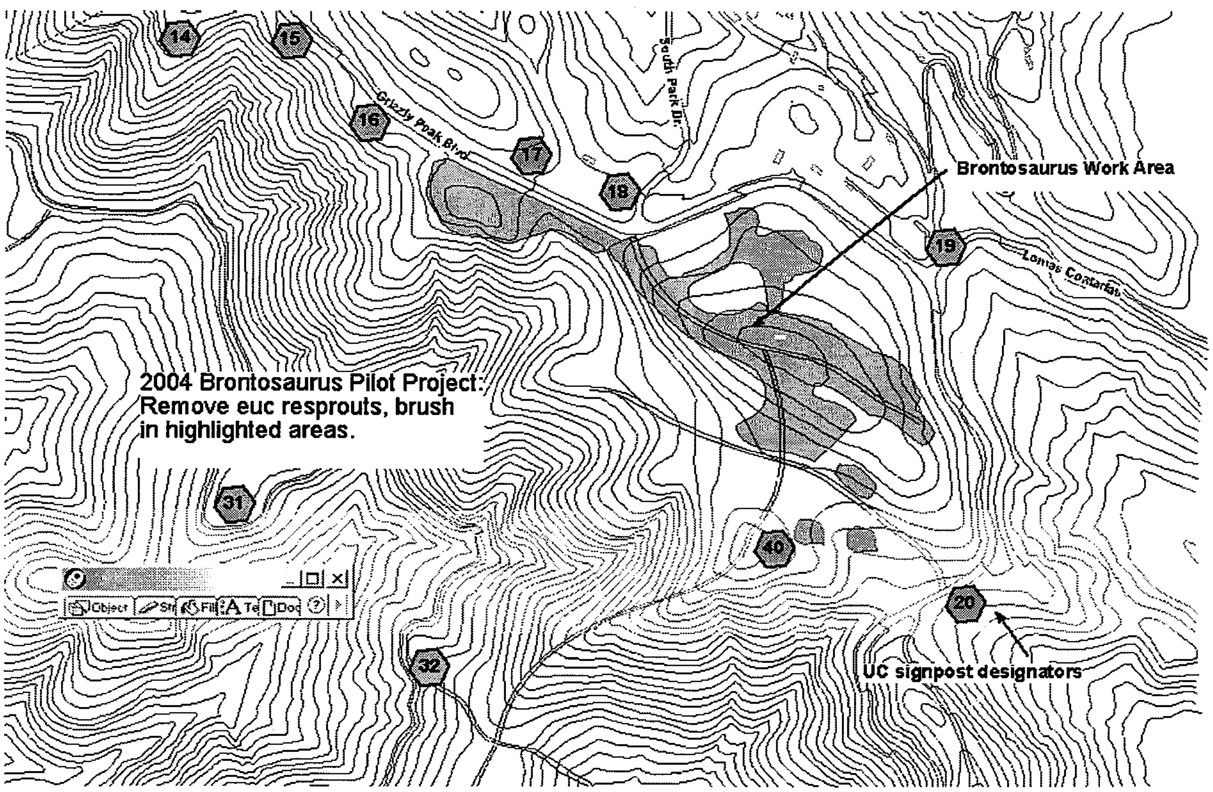
A more attractive approach would be to conduct such a project with a federal nexus, i.e. seeking and receiving Federal funding to perform the work. With the federal nexus, a Section 7 consultation from USFWS would be possible, which is a more streamlined process and does not require *per se* the creation of a Habitat Conservation Plan. A Section 7 process would take several months or more, and would require less extensive studies and surveys, at a lesser, but still appreciable, cost than a Section 10 and HCP process. This is a better fiscal management choice, but still costly and time consuming.

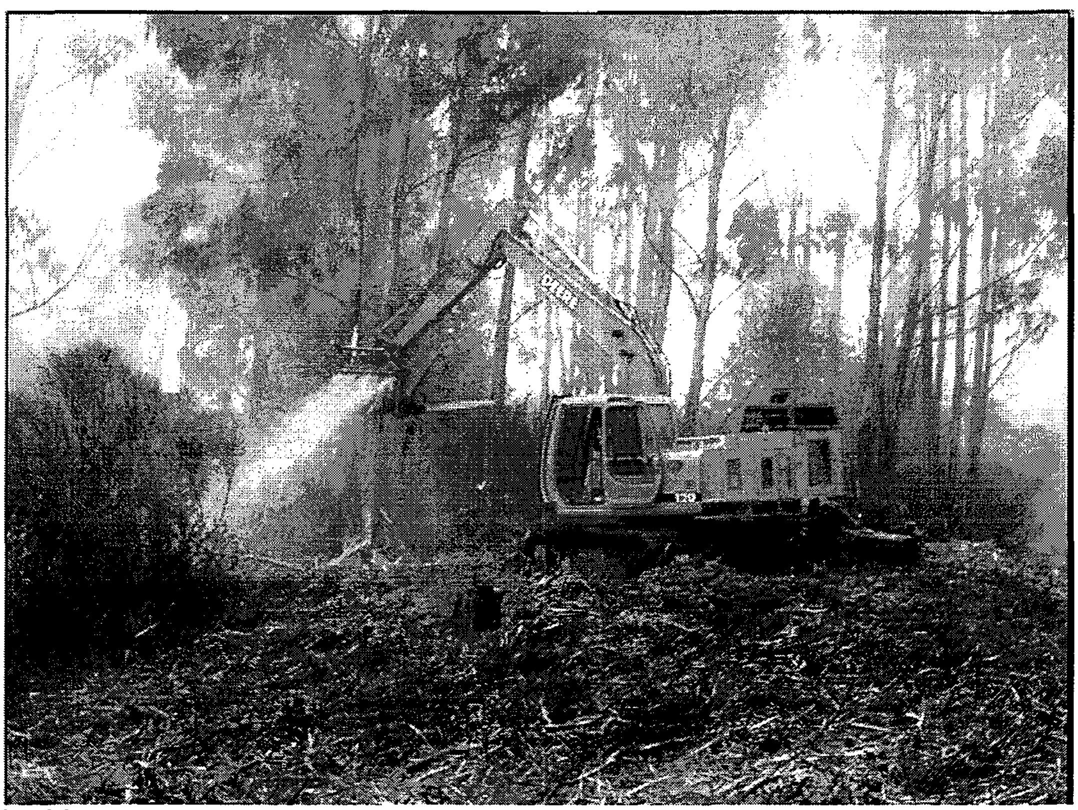
Perhaps the best approach is to design projects that can be reasonably found to have no impact on a Endangered Species Act (EPA) or California ESA listed species. That may be achieved by altering the timing of the work, the approach, or the location such that no impact can be foreseen. Such a project could still require biological consultations to review the site and approach, but it seems far more cost effective to modify timing and method in an *avoidance* strategy, than to obtain USFWS and/or California Department of Fish and Game permits. In some cases, where modification of the project approach does not yield an economical or satisfactory product, the work in the area could be suspended indefinitely. Instead, management actions could focus on other, unencumbered areas or could shift the location of the fuel break to a more attractive work site.

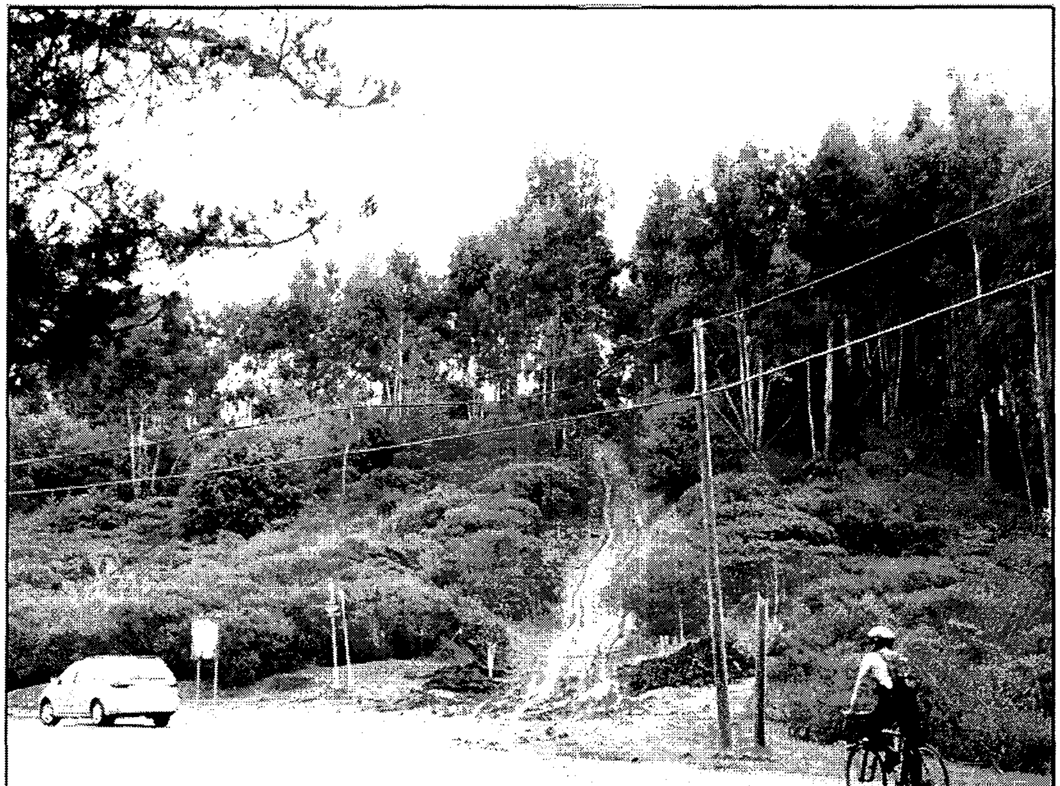
In this case, moving the fuel break efforts to the north-facing slope of Chaparral Hill, rather than the South-facing slope, which is AWS habitat, seemed a logical modification. In areas requiring permitting or expensive mitigation efforts, the best choice may be to do nothing and instead focus scarce management dollars on other areas where beneficial fire protection can be achieved. The overall benefit to protecting public safety may be best served initially by working in areas minimally regulated. Long-term planning for fire protection efforts should, however, recognize that – ultimately – environmental management, regardless of the outcome sought, should take a holistic and sustainable approach to protect bio-diversity and human land uses alike

PROJECT LOCATION







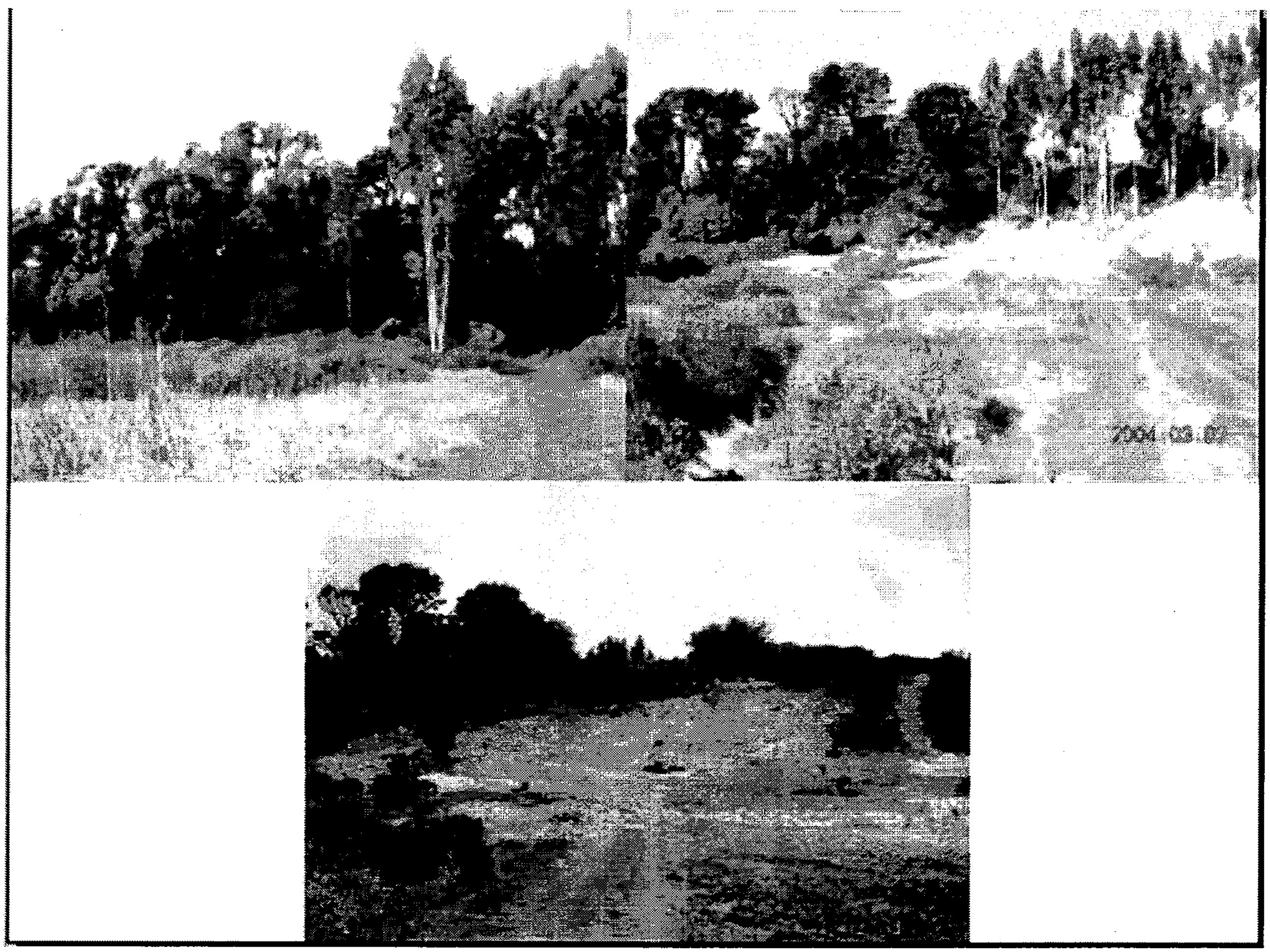


BEFORE: South Park and Grizzly Peak

AFTER: Brontosaurus and Tree Crew

Before, During and After. Looking WNW on Chaparral Hill towards Signpost 18

Before, During and After. Looking N toward Chaparral Hill from signpost 40



1. Chaparral Hill – Phase 2 B & C

In an effort cooperatively funded by UC and the City of Oakland, this project removed 1800 Blue Gum (eucalyptus) trees and a few dozen Monterey pines on the Chaparral Hill site near the intersection of Lomas Contadas and Grizzly Peak Blvd. The eucalyptus trees in the project area were last harvested in 1989-1990, so the trees were in the 15 year growth class and averaged 10 to 12 inches dbh (diameter at breast height). The pines averaged 16" dbh. During the project, felled trees were chipped and scattered on the project site.

The project was awarded to a contractor who provided a "feller-buncher", a timber harvesting machine that can mechanically grasp, cut and place individual trees in a single operation. The project site was well-suited to the feller-buncher's capabilities: the trees were sized within its 24" dbh working range, the slopes were within the 50% limitation range, and the stem density allowed for reasonably sized bunches without harming leave trees.

The felling work was timed to occur during winter, during a prolonged dry spell in which the soil had dried sufficiently to allow for the operation of heavy equipment without excess soil disturbance. The 1800 trees were felled in 3 days, consisting of approximately 15 working hours. This work pace allowed for the felling of approximately 120 trees per hour, an astounding production rate. The herbicide treatment was provided by UC staff, which was pressed to treat 2 cut stumps per minute within 5 minutes after felling. Placing applicators in close proximity to an operating feller-buncher is somewhat hazardous and requires close coordination between applicator and equipment operator, typically through visual signaling.

The trees were felled prior to the onset of avian nesting and fledging season, then remained on the ground for several months, until the rains had subsided to the degree that the skidding and chipping operations could commence on firm ground. The skidding and chipping took place in late May, over the period of about one week. All cut trees were chipped and all chips were retained on the project site. Additional wood chips were imported from adjacent project areas to provide mulch coverage of skid paths prior to the onset of the following wet season.

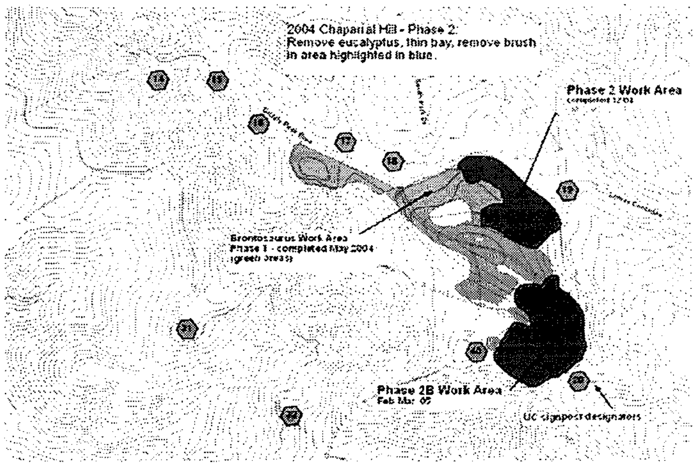
Overall, the project was a model of mechanized efficiency, whereby a very small number of personnel were used, and processing machinery was utilized to the maximum extent. Two workers were required during felling (the second to provide herbicide application), and two workers were needed for processing (one skid operator, one chipper operator). Approximately 130 man-hours were needed to fell and process 1800 stems, which translate to a worker productivity rate of 14 stems per man-hour. The Chaparral Hill 2 B/C project was, by far, the most efficient fuel removal project to date, achieving a unit cost of $12 per tree for removal and chipping (15 year age class).

Contractor: Expert Tree Service

1800 Stems Removed

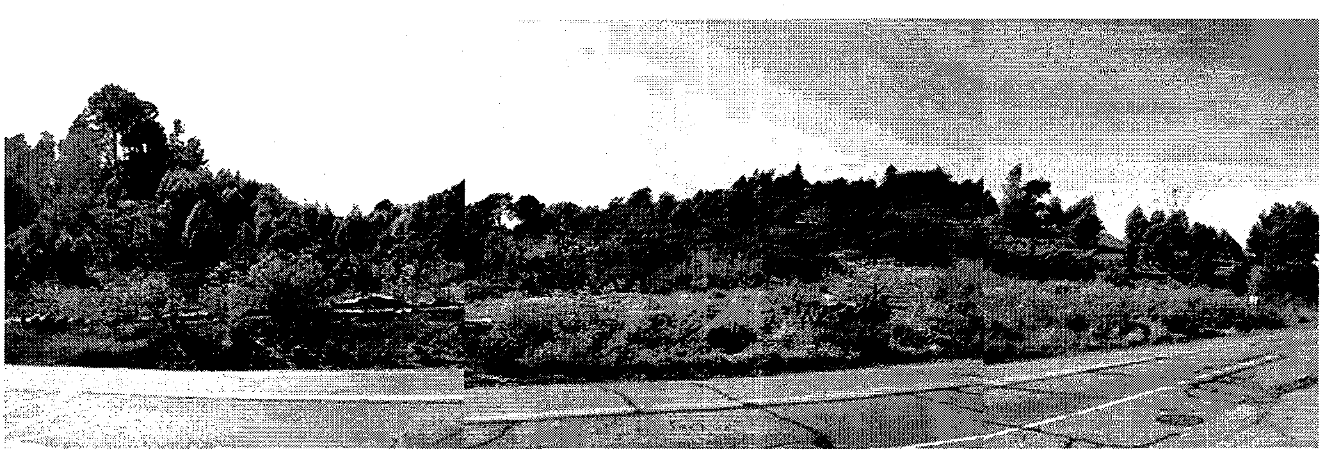
9 acres project site

$21,325

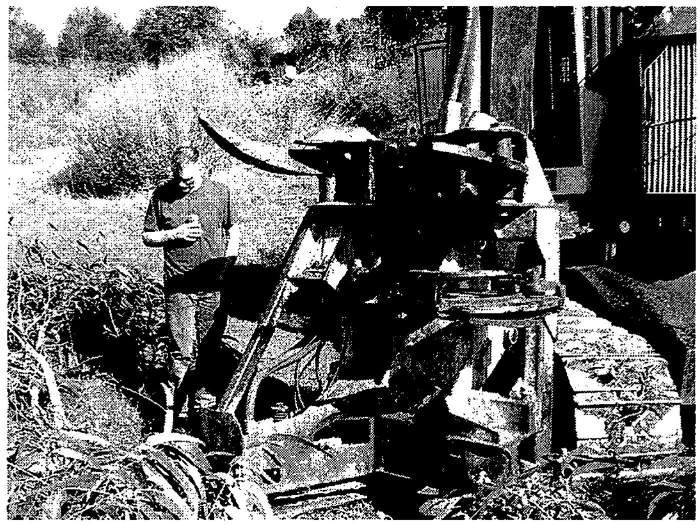


BEFORE

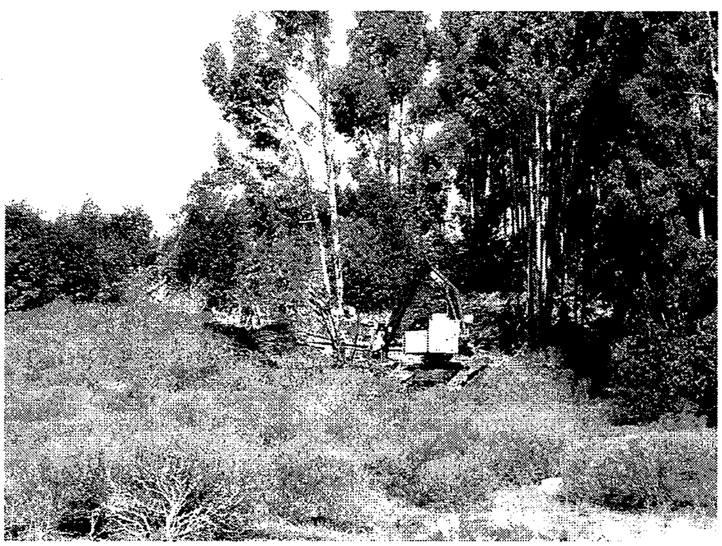
AFTER



FELLER-BUNCHER



FELLER-BUNCHER



UC Berkeley
FUEL REDUCTION PROJECT:

Claremont Canyon Phase 6 Eucalyptus Removal

C.1 PROJECT SUMMARY

As a component of the wildland fire management program analyzed in the 2020 Long Range Development Plan Environmental Impact Report, this project will remove eucalyptus, pine and acacia trees from a 14 +/- acre parcel of University land adjacent to Claremont Ave, one quarter mile below Grizzly Peak Blvd. In a manner consistent with best practices and mitigation measures identified in the 2020 LRDP EIR (SCH # 2003082131) the project will remove approximately 3200 stems within the 14 +/- acre project boundary (see map attached)

The project location is in a heavily vegetated canyon immediately adjacent to the cities of Oakland and Berkeley, near the site of -- and displaying similar fire risk conditions to -- the catastrophic 1991 Tunnel Fire.

In the project location, the under story is a rich assembly of native tree and shrub species growing beneath a canopy overwhelmingly comprised of re-sprouted eucalyptus and pine trees. The eucalyptus reproduces rapidly from nuts and resprouts, increasing the fuel load and density. Additionally, a small percentage of the canopy assemblage comprises exotic acacia species, which also spread rapidly and produce flammable litter.

The management strategy promotes a forest conversion: the emerging native forest of California bay, oak, maple, and redwood will be retained or augmented while the existing eucalyptus/pine dominated exotic canopy forest will be eradicated. The native species produce either considerably lesser fuel loads or are most fuel productive well before the peak of the regional fire season.

During the project, the native trees will be protected as practicable, while the exotic trees[1] will be removed and their stump cambium chemically treated with herbicide to prevent re-sprouting. Felled trees will be either chipped or retained whole on the project site. Removed stems may be recycled as roadside timbers, retained as habitat, or positioned for erosion control on the project site to the extent practicable and with the concurrence of the project manager.

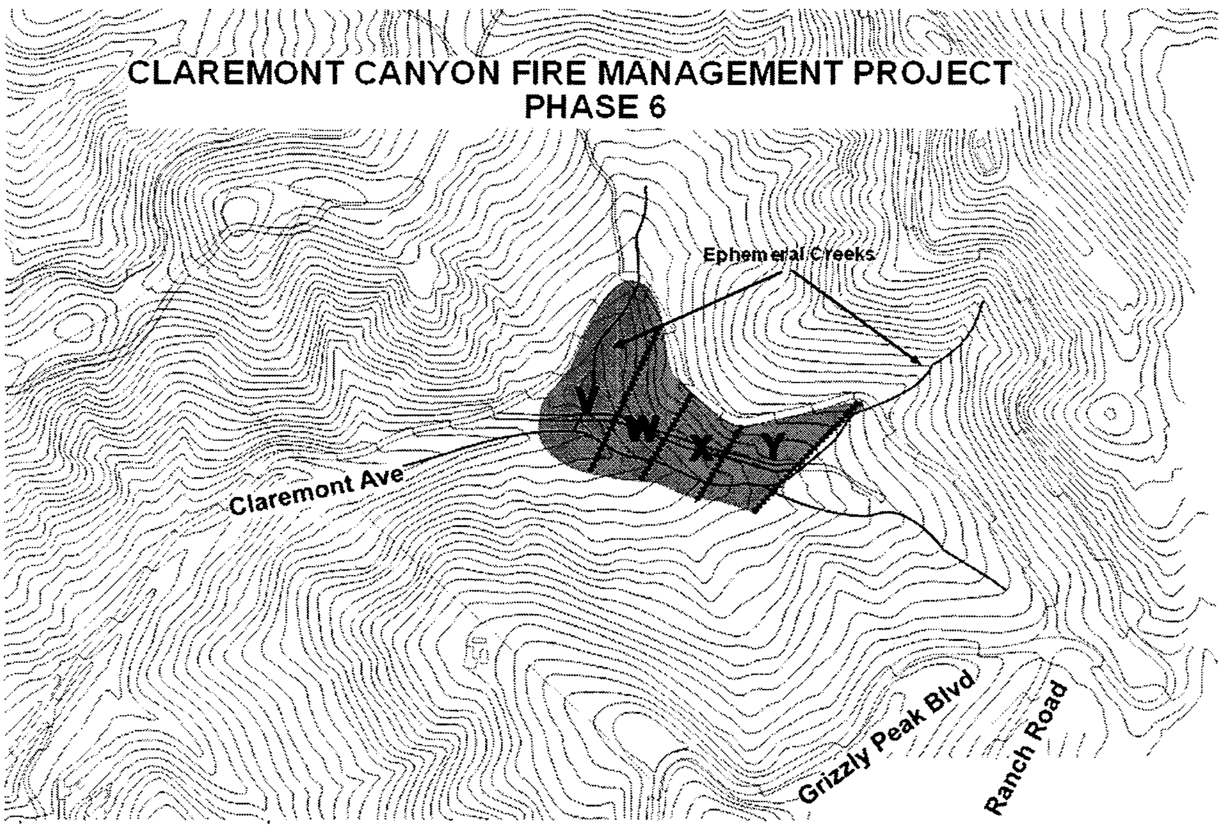
Protection of the native species, and ongoing management after project completion, will ensure a successful conversion protective of natural and recreational resource values, including but not limited to habitat, hydrology, soils and geology, aesthetics and air quality. Typically, only boles in excess of 24" diameter are selected for whole log retention.

Work will be done on mountainous terrain, which can have slopes up to 45 percent, have varying ground conditions, soil types, and vegetation types. Ground conditions can contain surface and below surface rock, stumps, and other debris that will vary in size, density, and depth.

[1] Monterey pine do not require herbicide treatment after felling

C. 2 PROJECT SITE MAP

For the purposes of bidding, the entire project site is divided into 4 sections: V, W, X and Y. The topographical map and aerial photo on the following page show the rough boundaries of the sections. Boundaries will be marked in the field along Claremont Avenue and with survey markers and will be fully covered in the project bid walk. Bids will be solicited for all 4 sections and the project will be awarded to a single contractor, based on the lowest cumulative bid for the chosen sections. Work will be awarded in the following order: Y, X, W, V as funding permits.




V
W
X
Y

Lower Strawberry Canyon Fuel Management Project

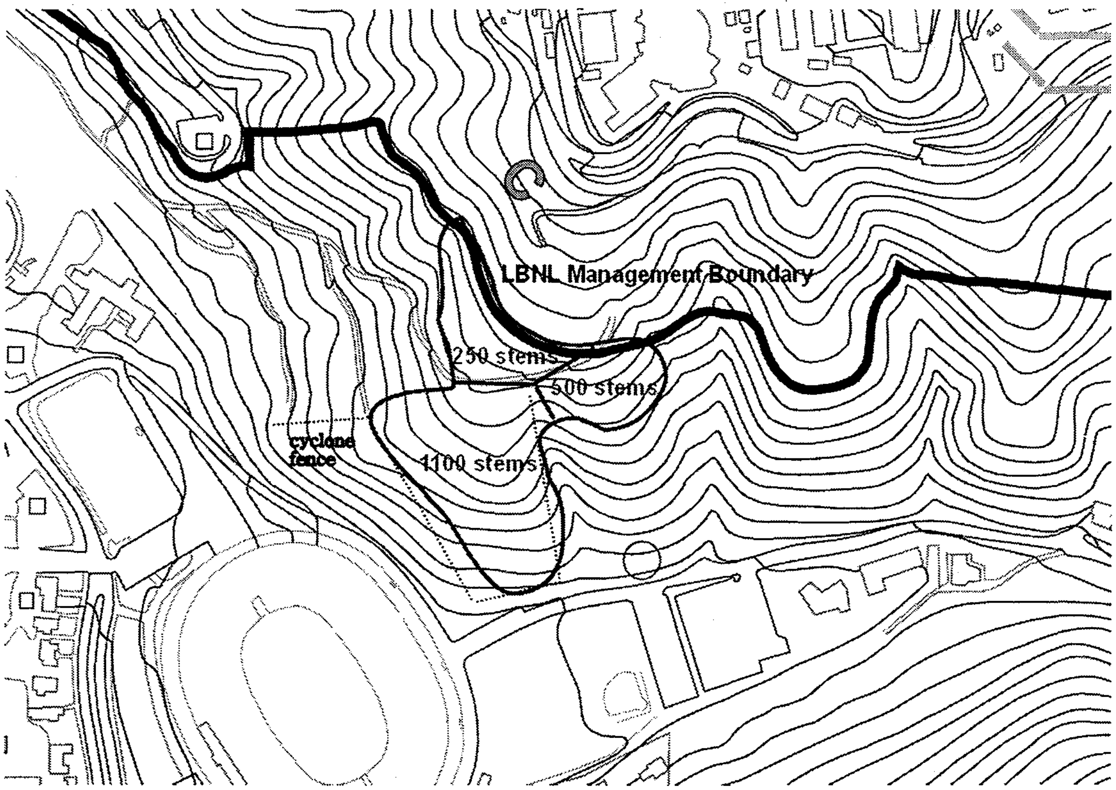
Project Description:

The project will clear up to 1000 immature blue gum, red gum and sugar gum eucalyptus trees (Eucalyptus spp.) and up to 50 Monterey pine trees (pinus radiata) from a 8 +/- acre parcel of University land East of Rim Way, and North of Centennial Drive, near the California Memorial Stadium. The trees proposed for removal are east of the stand of pine and oak trees commonly known as Tightwad Hill, and the Tightwad Hill stand is not proposed for management under this proposed project. All work shall be conducted in a manner consistent with best management practices and mitigation measures identified in the 2020 LRDP EIR (SCH#2003082131).

The project location is in a heavily vegetated canyon immediately adjacent to the cities of Oakland and Berkeley, and displaying similar fire risk conditions to the catastrophic 1991 Tunnel Fire. The eucalyptus reproduces vigorously from seeds and stump sprouts, increasing the fuel load and density over time. The area was subjected to several accidental fires in the 1980s, and many of the eucalyptus in the lower elevations of the stand show visible scarring and damage from those fires. Pile burning was conducted in the early 1990's to eliminate accumulated ground fuels. There is evidence of continued use of the area by illegal lodgers, increasing the risk from accidental ignitions.

The management strategy is to thin the grove of small, immature trees and to retain the larger eucalyptus and pine trees and as many native trees, forbs and grasses as practical. Approximately 60% of the eucalyptus trees in the stand are sprouts and immature trees less than 15 years of age, and are targeted for removal. Once the immature trees are removed, the stand may be managed as a shaded fuel break. All eucalyptus and pine stems less than 10 inches diameter at breast height (dbh) will be removed, and their stumps chemically treated to prevent resprouting. Additionally, in the lower portion of the stand, near Centennial Drive, approximately 20 mature stems will be removed, as these specimens are in declining health and/or threaten to topple onto adjacent Centennial Drive. Portions of an abandoned cyclone fence will also be removed to provide improved firefighter access and to address the aesthetic considerations. Felled trees will be chipped and retained on the project site.

Herbicides employed will be Garlon 4 (triclopyr), Roundup (glyphosate) and/or Stalker (imazapyr). The material will be applied as a cut stump treatment immediately after felling of each stem. The project duration is anticipated to be 4 weeks and is planned for completion prior to the first home football game in early September, 2007.



The stand is divided into 3 regions, containing an estimated 1850 stems. The project will remove all immature stems (those less than 10" diameter), and up to 20 mature trees at risk of falling onto Centennial Drive or adjacent trails.

Clark Kerr Track Fuel Management Project

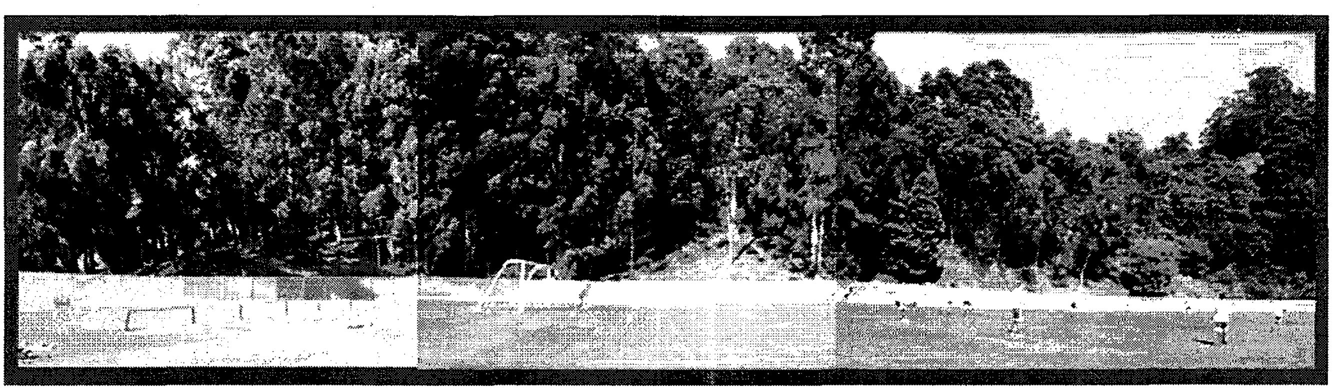
Project Description:

The project will clear up to 800 immature blue gum eucalyptus trees (Eucalyptus spp.) and up to 50 Acacia trees (Acacia spp.) from a 5 +/- acre parcel of University land East of the Clark Kerr Campus track. All work shall be conducted in a manner consistent with best management practices and mitigation measures identified in the 2020 LRDP EIR (SCH#2003082131).

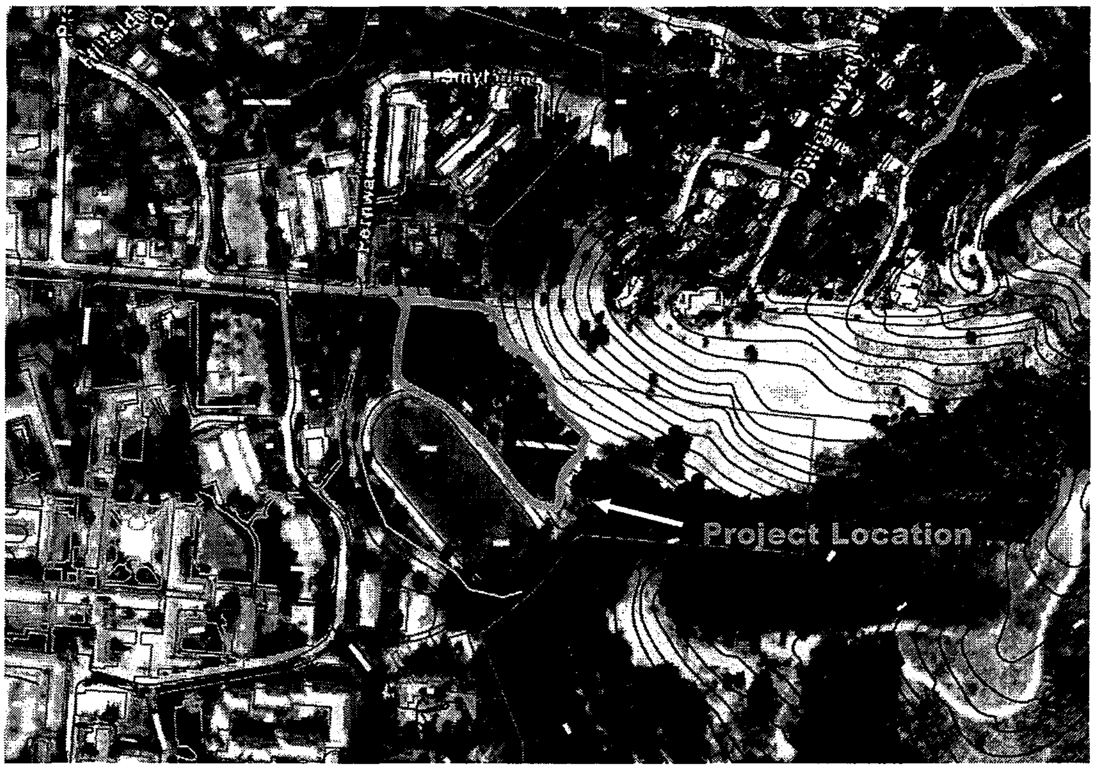
The project location is in a moderately vegetated canyon immediately adjacent to the cities of Oakland and Berkeley, and displaying similar fire risk conditions to the catastrophic 1991 Tunnel Fire. The eucalyptus reproduces vigorously from seeds and stump sprouts, increasing the fuel load and density over time.

The management strategy is to thin the grove of small specimens and to retain the larger eucalyptus trees and as many native trees, forbs and grasses as practical. Approximately 70% of the eucalyptus trees in the stand are sprouts and immature trees under 15 years of age, and are targeted for removal. Once the immature trees are removed, the stand may be managed as a shaded fuel break. All eucalyptus and acacia stems less than 10 inches diameter at breast height (dbh) will be removed, and their stumps chemically treated to prevent resprouting. Portions of an existing cyclone fence may be removed to provide improved firefighter access and to allow the removal of accumulated dead fuels. Felled trees will be chipped and retained on or adjacent to the project site.

Herbicides employed will be Garlon 4 (triclopyr), Roundup (glyphosate) and/or Stalker (imazapyr).. The material will be applied as a cut stump treatment immediately after felling of each stem. The project duration is anticipated to be 4 weeks and is planned for completion prior to November 15, 2007.



East Elevation of eucalyptus stand proposed for thinning and clean up



In this section of the project, most of the stems in the background would be within the size range of the project scope. Several of the foreground stems exceed 10" dbh and would thus be retained to provide a shaded fuel break.

CHAPARRAL HILL – PHASE 3 FUEL REDUCTION PROJECT

UC Berkeley Fire Mitigation Program

Project Description:

The project will clear up to 600 immature blue gum and red gum eucalyptus trees (Eucalyptus spp.) and up to 100 Monterey pine trees (pinus radiata) from a 4 +/- acre parcel of University land along the northwest region of Chaparral Hill, West of Grizzly Peak Blvd. The project will retain all native trees to the extent practicable, with the goal of native plant restoration. All work shall be conducted in a manner consistent with best management practices and mitigation measures identified in the 2020 LRDP EIR (SCH#2003082131).

In the project location, the under-story is a dense covering of native and exotic shrub species growing beneath a canopy comprised largely of re-sprouted eucalyptus trees scattered pine trees. The trees are typically less than 16 years old, and are primarily resprouts emerging from the fuels management projects of 1989/1990.

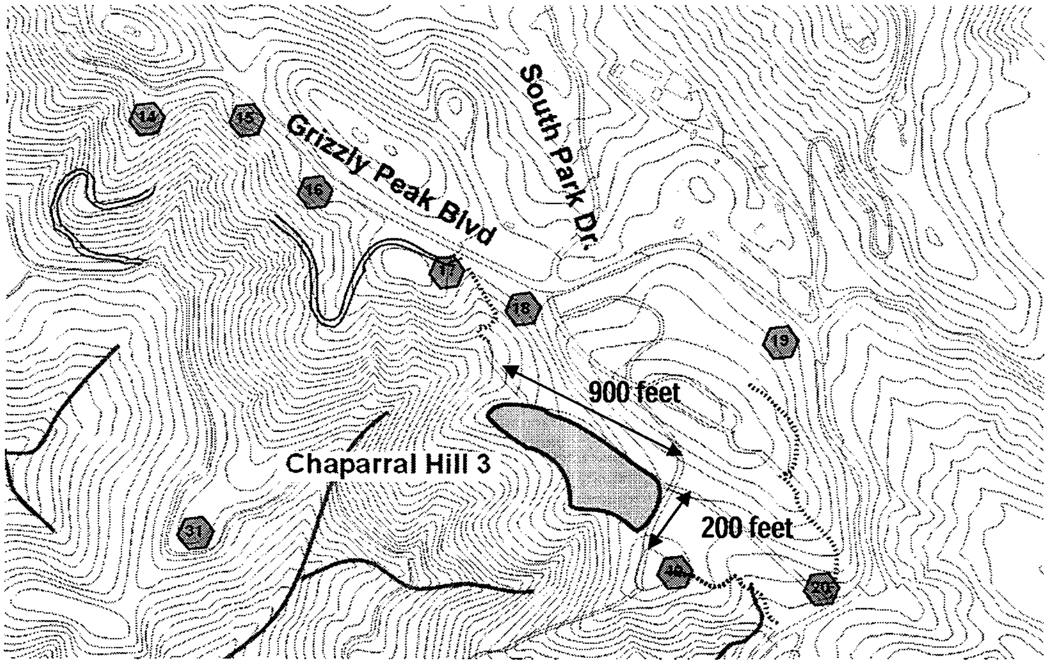
The management strategy promotes a forest conversion: the emerging native forest of California Bay and Oak, will be retained and the existing eucalyptus dominated exotic canopy forest will be removed. Selected Monterey pines (exceeding 22" dbh) may be retained as avian habitat, as determined by a qualified biologist. Felled trees and disturbed brush will be chipped or masticated and retained on the project site. Any green material exported from the site leaving the Light Brown Apple Moth quarantine zone will be inspected by either a certified green waste station or by a field inspector from the County Agricultural Commissioner.

Herbicides employed will be Garlon 4 (triclopyr), Roundup (glyphosate) and/or Stalker (imazapyr). The material will be applied as a cut stump treatment immediately after felling of each stem. The project duration is anticipated to be 4 weeks and is planned for completion prior to November 15, 2007. The area is not within the recent EPA designated herbicide restriction areas for California Reg Legged Frog. Best management practices relative to the protection of the Alameda Whipsnake will be employed throughout the project to avoid any substantial adverse affects on the species, which are known to exist within ½ mile of the project site.

In order to facilitate ongoing access to the stumps of removed trees, surrounding brush stands will be mechanically treated to ground level. All masticated brush and tree material will remain on site. A mosaic of mature brush will be retained, as feasible, to serve as faunal refuge and to diversity habitat type and quality.

Protection of the native species, and ongoing management after project completion, will ensure a successful conversion protective of natural and recreational resource values, including but not limited to habitat, hydrology, soils and geology, and air quality. Work will be conducted over the winter only as weather permits. Rain or wet conditions will result in work stoppage until conditions allow continuance.

As an ongoing maintenance operation, all cut eucalyptus tree stumps shall receive annual follow up treatment of Garlon 4/ Stalker/Roundup on any emerging stump sprouts, to ensure the maximum percentage of eucalyptus elimination from the project area. Follow up treatment (not included in this contract) will occur continuously after completion of initial removal by contractor.



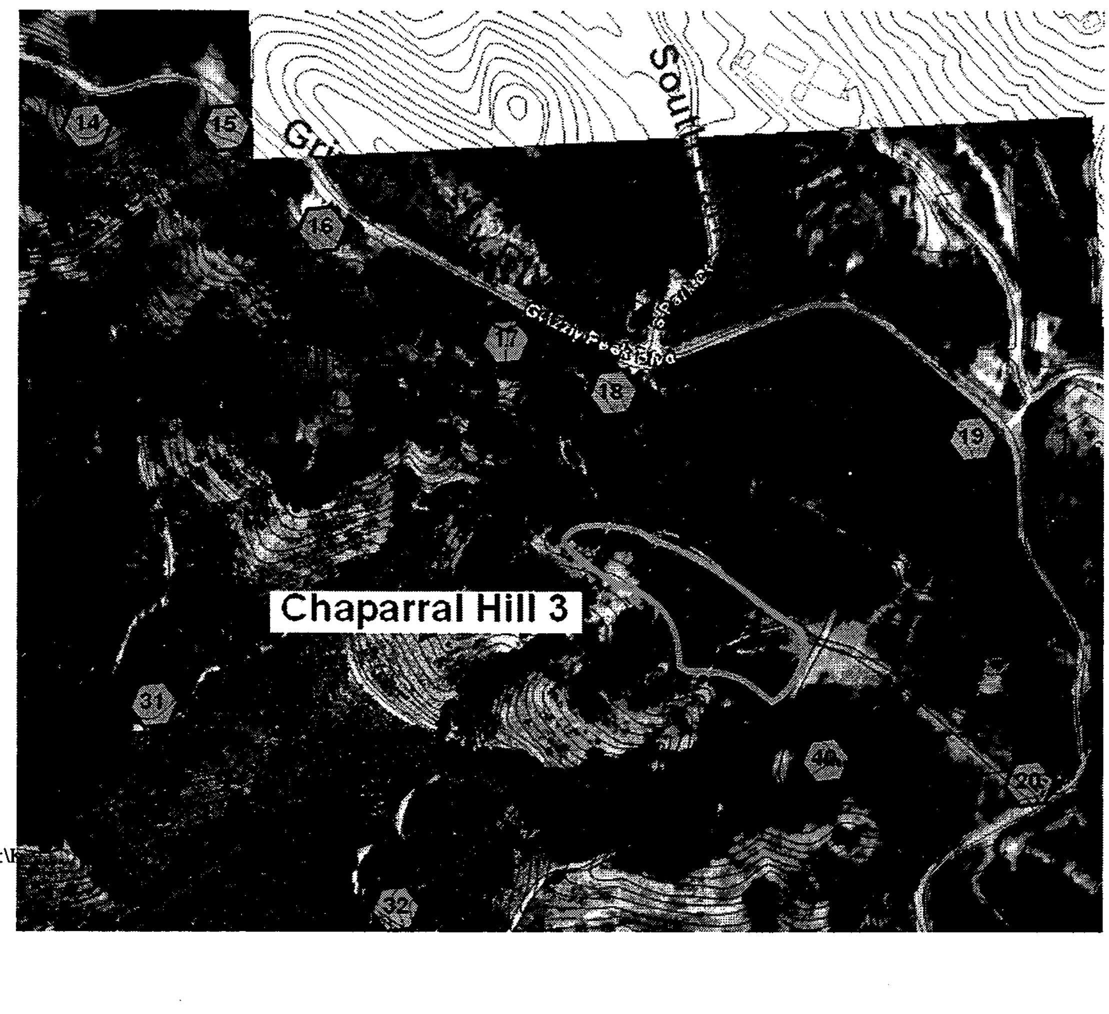


EXHIBIT G

EXHIBIT H

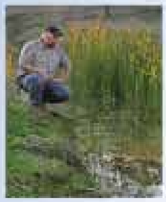
EXHIBIT I

EXHIBIT J

EXHIBIT K

East Bay Watershed **Master Plan**





2018

EBMUD

EAST BAY WATERSHED MASTER PLAN UPDATE

East Bay Municipal Utility District Board of Directors

Lesa R. McIntosh	President
William B. Patterson	Vice President
John A. Coleman	
Andy Katz	
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District Personnel

Alexander R. Coate	General Manager
Richard G. Sykes	Director of Water and Natural Resources
Douglas I. Wallace	Environmental Affairs Officer, Master Plan Update Project Manager
Scott D. Hill	Manager of Watershed and Recreation
Jose D. Setka	Manager of Fisheries and Wildlife
Rick Leong	Principal Management Analyst
Rachel R. Jones	Office of General Counsel
Jessica Purificato	Fisheries and Wildlife Biologist II
Michael Bergstrom	Senior Graphic Designer

East Bay Watershed **Master Plan**

Prepared by:
East Bay Municipal Utility District
375 - 11th Street
Oakland, CA 94607
510-287-1370
Contact: Douglas I. Wallace

February 29, 1996
Revised March 15, 1999
Updated May 22, 2018

EBMUD

This document should be cited as:
East Bay Municipal Utility District. 1996. East Bay Watershed Master Plan. February 29, 1996. Revised March 15, 1999. Updated May 22, 2018. With technical assistance from Jones & Stokes Associates; Brady and Associates; Dillingham Associates; REM & Associates; Merritt Smith Consulting; Reza Ghezelbash, GIS Consultant; and Montgomery Watson. (JSA 94-320.) Oakland, CA.

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LIST OF ACRONYMS AND ABBREVIATIONS

ADA	Americans with Disabilities Act
AUMs	animal unit-months
BHAPA	Briones Hills Agricultural Preservation Area
BMP	best management practice
Board	East Bay Municipal Utility District Board of Directors
CAC	Community Advisory Committee
Caltrans	California Department of Transportation
CCCFPD	Contra Costa County Fire Protection District
Cal Fire	California Department of Forestry and Fire Protection
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
DBPs	disinfection byproducts
District	East Bay Municipal Utility District
EBRPD	East Bay Regional Park District
EBWMP	East Bay Watershed Master Plan
EIR	environmental impact report
FMU	fire management unit
GIS	geographic information system
HCP	Habitat Conservation Plan
IPM	integrated pest management
ITP	Incidental Take Permit
PAHs	polynuclear aromatic hydrocarbons
PCBs	polychlorinated biphenyls
TAC	Trails Adjunct Committee
THMs	trihalomethanes
USFWS	U.S. Fish and Wildlife Service
voCs	volatile organic compounds

Forestry

The District's lands support a substantial area of native and non-native forest habitats. Native forest communities include redwood, knobcone pine, and several hardwood-dominated forest types, and represent one of the most valuable natural resource assets on the watershed. Most of the non-native forest stands consist of monocultures (i.e., even-aged, single-species stands) of Monterey pines and eucalyptus planted during the 1930s and 1940s to provide stability to watershed soils.

Forest management is defined in this plan as activity undertaken to manage woody vegetation in non-native forest stands (i.e., Monterey pine and eucalyptus) on District watershed lands. Management of the native forests is provided for under "Biodiversity".

The District's forestry goal is to develop and implement a long-term management program for non-native forests to maintain and enhance other environmental resources, including water quality, fire protection, biodiversity, visual quality, and recreation use.

Forest management will be achieved through selective management of the non-native forests, where necessary and financially feasible, to maintain and increase the vigor of the stands and to encourage the replacement of non-native forests with native species over the long term. Priorities for conversion will be based on the need to reduce fire risks, maintain and enhance biological values, and protect water quality. Native forests will be managed to encourage natural regeneration processes and maintain and enhance biological values.

Program Direction

Goal

Continue the ongoing long-term management program for non-native forests to maintain and enhance other environmental resources, including water quality, fire protection, biodiversity, visual quality, and recreational use.

Objectives

- Implement a long-term plan for managing non-native forest species that includes maintenance of stand health and vigor and phased conversion of selected stands of non-native forests to native forests or other ecologically suitable habitats.
- Use forest management as a tool to achieve strategic fire management goals, biodiversity goals, and other resource goals.
- Protect water quality, biodiversity, and other resource values during forest management program implementation.
- Manage trees in areas of high public use to ensure visitor safety and maintain aesthetic values.

Guidelines

FOR.1 Discourage or prevent establishment of new stands of non-native woody vegetation and the expansion of existing stands.

FOR.2 Establish priorities for implementing non-native forest management based on fire risk to public safety and water quality degradation, stand vigor, opportunities for habitat enhancement, and visual impacts.

FOR.3 Avoid clear-cutting and other even-aged harvest techniques for areas greater than 2 acres in size to reduce impacts on water quality and other resources.

FOR.4 Follow standard practices and BMPs for forest management to reduce resource damage during harvest and subsequent management and to protect water quality (i.e., minimize sediments, nutrients, and organic matter in runoff).

FOR.5 Follow management measures outlined in the HCP for non-native forest areas that support special-status wildlife species and manage these areas to avoid disturbing associated special-status species.

FOR.6 Consider minimum management prescriptions, including retaining non-native forests, in areas where stands cannot be removed without significant impacts on water quality, biodiversity, visual quality, or other resource values.

FOR.7 Where replacement of non-native forest (Monterey pine and eucalyptus) with native forest is not feasible because of site conditions, habitat value, impacts on water quality or biodiversity, or fire risk, establish site-specific management objectives to restore other native habitats or continue managing non-native forest.

FOR.8 Evaluate the fire risk of immediate harvest and resulting long-term stand modifications when developing silvicultural prescriptions and management plans for individual forest stands. Ensure consistency with management directions for other resources in forest management plans.

FOR.9 Retain dead and downed material for use by special-status wildlife species, except where removal is required for strategic fuels management, fire control, water quality protection, habitat regeneration, public safety, or for other justified reasons.

Eucalyptus Management

FOR.10 Implement a long-term phased program to remove eucalyptus stands and restore native woodland or other natural habitats to reduce fire hazards in areas where eucalyptus poses a significant fire risk.

FOR.11 Prior to any harvest activities, ensure that adequate stump-sprouting control methods are available to reduce fire hazards and protect water quality. Herbicides will not be used to control stump resprouts.

Monterey Pine Management

FOR.12 Implement silvicultural treatments necessary to maintain the short-term vigor of Monterey pine forest stands and to meet long-term stand management objectives.

FOR.13 Where feasible and appropriate, implement long-term management to replace Monterey pine forest with native species to reduce fire hazards, enhance biological values, and maintain water quality.

EXHIBIT L


UNIVERSITY OF
CLAREMONT

Letter O10

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Planning Departmental <planning@berkeley.edu>

resubmiting dEIR comments with correct date

1 message

beneficialbug@sonic.net <beneficialbug@sonic.net> Mon, Oct 5, 2020 at 10:39 PM
To: planning@berkeley.edu

To Whom It May Concern,

In submitting comments earlier, we realized we mis-dated the submission of the comments (had written 10/6/20 rather than 10/5/20). In rereading just after submitting at 4:59 with a list of attachments, we realized an attachment which had been part of the group of attachments we did not list in the list of attachments. We also realized that another was 'zipped' so since we were going to re-submit this evening with the correct date, we took the time to add submission dates to the document names of those attachments and slightly changed the names to have the document names better match what's in the documents, and made a corrected list of attachments, which is below. Not attachments have been added, though the last one is renamed. O10-1

NO CONTENT IN THE DOCUMENTS HAS BEEN CHANGED OTHER THAN THE FOLLOWING CORRECT LIST OF ATTACHMENTS WHICH SHOWS UP IN THE DOCUMENT OF THE HILL CAMPUS dEIR COMMENTS FROM EAST BAY PESTICIDE ALERT, and the corrected submission date of that document which also is pasted into this email:

****

EAST BAY PESTICIDE ALERT'S FORMAL COMMENTS IN RESPONSE TO THE UC HILL CAMPUS dEIR, SUBMITTED BY MAXINA VENTURA, CHRONIC EFFECTS RESEARCHER FOR EBPA, 10/5/2020

To Whom It May Concern: O10-2

I have attached the following documents, most but not all of which have been submitted formally over time. This dEIR document includes summaries of former comments, but we ask that the final EIR retain our full comments and citations for the purpose of the public and attorneys having direct access to these writings and links to other resources offered, all in context.

We have some basic demands:

1) Stop referring to deforestation or pesticiding as wildfire safety. All these comments and documents clarify that this is disingenuous and misleading O10-3

2) Use no herbicides but utilize controlled burns or mechanical methods of removal if you insist it's needed in some areas in consideration of so many people moving into the hills, creating danger with a gasoline grid covering the hills, gas appliances, and gas tanks O10-4

3) Replant Eucalyptus and other tall trees, including Firs, which do well in this area and under present circumstances to keep the hills moist O10-5

4) Realize that Joe McBride and Claremont Conservancy's and Sierra Club's demands for deforestation are not based in Biology, nor are they consistent with Joe McBride's excellent, very specific research and writings of the past, much of that specific to Eucalyptus plantations. In fact, to do this would consign our neighbors over the hills to massive wildfires due to the Golden Gate winds whipping up minor fires into conflagrations because of all the dry grasses and through manufactured wind tunnels which so far Eucalyptus and other tall trees have helped obstruct, one of the historical reasons Eucalyptus has been planted all over California, since the mid-19th century O10-6

5) Look closely at the links provided for photos and videos of 2020 California fires, and account for the reality of trees not being the cause of fires. UC's own David Ackerly had to admit that about the '91 fire when at a public lecture people were yelling that Eucalyptus trees were the cause of the '91 hills fire O10-7

'

Sincerely,

Maxina Ventura for East Bay Pesticide Alert
beneficialbug@sonic.net *** please acknowledge receipt

Attachments to UC dEIR comments from East Bay Pesticide Alert submitted 10/5/20:
Article published in Berkeley Daily Planet: There's No Quick Fix! (3/15/2005) EBPA NOP Vegetation Management comments (12/20/19)
EBPA softball LRDP EIR Addendum comments(1/17/20)
EBPA UC Regents, Herbicide use comments (1/23/20)
Max Ventura's NOP LRDP comments (4/2020)
People's Park Committee's NOP LRDP group & indiv.(4/27/20)
EBPA's NOP LRDP comments (5/15/20)
EBPA's Mt. Sutro dEIR comments (9/11/20)
EBPA's dEIR East Bay Hills Veg. Mgmt. comments (9/12/20) O10-8
UC IPM policy page from the Herbicide Task Force document (late 2019 or early 2020)
People's Park aerial photo 4/2018 East forest intact
People's Park aerial photo 4/2019 showing destruction after 42 trees demolished by UC the past winter
Wildfire photos, video Aug/Sept/Oct 2020
EBPA's UC Hill Campus dEIR comments 10/5/20
LRDP response, People's Park 2020

*** EBPA = East Bay Pesticide Alert

*** LRDP = Long Range Development Plan
*** NOP - Notice of Preparation
*** UC = University of California
*** Mt. Sutro UCSF land

****

We're sorry for the resubmission technically late but, in fact, I have neurological effects due to pesticide poisoning and what is simple for others, such as doing something like attaching documents, ends up taking me hours where it could take someone else without this neurological impact possibly mere minutes. I do this work not receiving any money, but because I want to keep others from the kind of damage most East Bay Pesticide Alert members have suffered from Multiple Chemical Sensitivity caused by pesticides and other petrochemicals so I would ask for what has been the kind of accommodation my kids and I have had in education institutions due to these issues, which is some leeway with deadlines. O10-8 cont.

Additionally, by including this later submission, for those reviewing the dEIR comments, they are likely to be more useful with the dates and the slightly altered document titles I'm sending now. Thank you for your consideration of disability accommodation.

Thank you,

Max Ventura for East Bay Pesticide Alert

Maxina Ventura
Classical Homeopathy, Non-toxic Medicine
All Ages, All Genders
WiseWomanHealth.com

15 attachments

PP trees 4.2018.png
1006K

PP trees 4.2019.png
2089K

There is No Quick Fix!.pdf
72K

UC NOP EIR Veg. Mgt. 12:20:19.pdf
534K

UC softball EIR Addendum 1:17:20.pdf
458K

UC Regents Herbicides 1:23:20.pdf
367K

UC NOP LRDP, Max 4:2020.pdf
29K

UC NOP LRDP PPC 4:27:20 .pdf
49K

UC LRDP EBPA EIR 5:15:20.pdf
142K

UC Mt Sutro dEIR 9:11:20.pdf
82K

UC dEIR, EB Hills Veg. Mgmt 9:12:20.pdf
73K

UC IPM policy- USE 2019:20.pdf
95K

Wildfire photos, video 2020, UC EIR.pdf
35K

UC Hill Campus dEIR 10:5:20.pdf
32K

UC LRDP response, Peoples Park, 2020.pdf
42K

Letter
I1

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Planning Departmental <planning@berkeley.edu>

"Draft EIR Comments: WVFMP

ॐ **Bronwyn Ayla** [redacted] Fri, Aug 14, 2020 at 12:22 PM
To: planning@berkeley.edu

To whom it may concern.
I strongly oppose the use of herbicides for fire prevention. Many of us are beekeepers on Panoramic Hill and these herbicides pose a direct threat to bees, humans, and other wildlife. While fire prevention is essential, poisoning our environment with herbicides is not. I1-1
thank you

--

Bronwyn Ayla, LAc.
Healing | Reiki | Dance | Blog
[redacted]

Letter
I2

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Planning Departmental <planning@berkeley.edu>

Draft EIR Comments: WVFMP

Kevin Ma [redacted] Fri, Aug 14, 2020 at 8:24 PM
To: planning@berkeley.edu

As a Berkeley graduate, I support any plan that removes as much eucalyptus trees as possible, along the lines of the Sierra Club's 3R alternative. Eucalyptus is not a native plant and is notoriously dangerous in wildfires; keeping them endangers the university and the people living around it. They should instead be replaced with native plants. I2-1

I grant permission to UC Berkeley to read my comments aloud as part of the online public session.

Sincerely,
Kevin Ma
B.S. 2018

Letter I3

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Planning Departmental <planning@berkeley.edu>

Wildland Management

Nadesan Permaul [redacted] Fri, Aug 14, 2020 at 1:28 PM
To: Planning Departmental <planning@berkeley.edu>

As the first and former Emergency Preparedness Officer for the campus, I strongly support wildland management by the campus on its properties. I was in the campus EOC during the Oakland Hills Fire and know first hand how important it is to control wildland vegetation in advance of fire seasons. I3-1
Nad Permaul

--
Nadesan Permaul
Lecturer in Rhetoric and Political Science, U.C. Berkeley

Cal BERKELEY 150 1868 ★ 2018 150 YEARS OF LIGHT 150 W

Academic Sponsor for Rhetoric 98/198- History, Spirit & Traditions at Cal Decal Class
Retired Director of the Associated Students of the University of California

[redacted]

Letter
I4

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Planning Departmental <planning@berkeley.edu>

Draft EIR Comments: WVFMP

Alfred Twu [redacted] Fri, Aug 14, 2020 at 7:32 PM
To: planning@berkeley.edu

Please get rid of all the Eucalyptus Trees.

They are the biggest hazard to our neighborhood, and are NOT visual resources. There is nothing scenic about constantly being reminded that the entire city could burn to the ground. I4-1

I grant permission to UC Berkeley to read my comments aloud as part of the online public session.

Thank you
Alfred Twu
Berkeley resident

--
~~~ ~~~
~~~

Letter I5

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Planning Departmental <planning@berkeley.edu>

Draft EIR Comments: WVFMP
2 messages

Mike Vandeman Sat, Aug 15, 2020 at 7:20 PM
[redacted]
To: planning@berkeley.edu

This plan is utterly stupid on many levels! I5-1

1. It ignores fire detection. Instantaneous fire detection is necessary and sufficient to protect against fire. It's also the cheapest solution. I5-2

2. Joe McBride is a forester, not a biologist. His plan will destroy (and has already destroyed) habitat for native wildife. It is also a very expensive solution, since it requires yearly clearcutting along roads and trails. Forever! I5-3

3. It makes mincemeat of the Endangered Species Act, by destroying (and has already destroyed) habitat for the federally Threatened Alameda whipsnake. I5-4

4. Invasive non-native plants have been destroying habitat for native wildlife. That is what you should be removing, not native plants. I5-5

Mike Vandeman, Ph.D.

--
I am working on creating wildlife habitat that is off-limits to humans ("pure habitat"). Want to help?(I spent the previous 8 years fighting auto dependence and road construction.)

Wildlife must be given top priority, because they can't protect themselves from us.
Please don't put a cell phone next to any part of your body that you are fond of!
[redacted]

Mike Vandeman Sat, Aug 15, 2020 at 7:43 PM
[redacted]
To: planning@berkeley.edu

This plan is utterly stupid on many levels!

1. It ignores fire detection. Instantaneous fire detection is necessary and sufficient to protect against fire. It's also the cheapest solution.

2. Joe McBride is a forester, not a biologist. His plan will destroy (and has already destroyed) habitat for native wildife. It is also a very expensive solution, since it requires yearly clearcutting along roads and trails. Forever!

3. It makes mincemeat of the Endangered Species Act, by destroying (and has already destroyed) habitat for the federally Threatened Alameda whipsnake.

4. Invasive non-native plants have been destroying habitat for native wildlife. That is what you should be removing, not native plants.

Mike Vandeman, Ph.D.

P.S. I grant permission to UC Berkeley to read my comments aloud as part of the online public session.
[Quoted text hidden]

Letter
I6

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Planning Departmental <planning@berkeley.edu>

Draft EIR Comments: WVFMP

Emmerich Anklam [redacted] Wed, Aug 19, 2020 at 6:57 PM
To: planning@berkeley.edu

Dear Raphael Breines,

I'm writing to support the removal of eucalyptus trees as relates to the Wildland Vegetative Fuel Management Plan.

As a Berkeley resident who's spent his entire life in the Bay Area, I empathize with those who consider eucalyptus, in the words of the Plan, a visual resource. However, it is time for us to prioritize safety and ecological health. Eucalyptus is a dangerous invasive, and this week alone has demonstrated that fires at the wildland-urban interface aren't going away anytime soon. Removing eucalyptus is a crucial step toward keeping our communities safe, so that we can help prevent a future natural occurrence from becoming a human tragedy. I6-1

If we want to support preservation of natural features, we should prioritize native plants and wildlife, rather than protecting recently introduced trees that drive out native plants and wildlife where they take hold.

Thank you for putting together this plan, and for giving such thoughtful consideration to the safety and environmental health of this community.

I grant permission to UC Berkeley to read my comments aloud as part of the online public session.
Sincerely,
Emmerich Anklam

Letter
I7

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Planning Departmental <planning@berkeley.edu>

Draft EIR Comments: WVFMP

Jordan Burns Wed, Aug 19, 2020 at 3:12 PM
[redacted]
To: planning@berkeley.edu

Hello,

Please remove flammable eucalyptus trees from Berkeley. They are putting our community in danger. If possible, replace them with native plants-- but first things first, we have to get rid of them before disaster strikes. I7-1

Thank you,

Jordan Burns
UC Berkeley Graduate Student

Letter
I8

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Planning Departmental <planning@berkeley.edu>

Draft EIR Comments: WVFMP

Dana Kilian Wed, Aug 19, 2020 at 6:14 PM
[redacted]
To: planning@berkeley.edu

To whom it may concern,
As a Cal alumni and current Berkeley Hills resident, I am in favor of reducing our fire danger by removing Eucalyptus trees in the hills. It's clear that we have imminent danger and should do everything we can to mitigate it including removing insidious, non-native and highly flammable trees. I8-1

I grant permission to UC Berkeley to read my comments aloud as part of the online public session.
Respectfully,
Dana Kilian
[redacted]
Berkeley, CA 94708

Letter
I9

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Planning Departmental <planning@berkeley.edu>

Draft EIR Comments: WVFMP

Sam Mountain Wed, Aug 19, 2020 at 3:10 PM
[redacted]
To: planning@berkeley.edu

Hello,

I'm a third year Urban Studies student and plan to focus my future career on urban sustainability. I'm writing to call for the removal of eucalyptus trees from the UC Berkeley campus. These trees, while beautiful, are both invasive and a massive fire hazard. Given the deleterious effects of recent wildfires on students, faculty, and City of Berkeley residents alike, I find it unconscionable that the University's current planning practices favor aesthetics over safety. I9-1

There are plenty of beautiful tree species that are far less flammable and more suited to the climate and native flora that the campus provides. We cannot abide having what is essentially a giant pile of fuel in the middle of our campus while dealing with some of the worst fire seasons on record.

Thank you,
Sam

P.S. -- UC Berkeley staff have my permission to read this comment aloud as part of any public or private hearing.

--
Sam Mountain (he/him)
Program Assistant, Transfer-to-Excellence REU
Center for Energy Efficient Electronics Science
Urban Studies/GIST '21
University of California, Berkeley

Letter
I10

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Planning Departmental <planning@berkeley.edu>

Draft EIR Comments: WVFMP

Emily Pothast Wed, Aug 19, 2020 at 2:57 PM
[redacted]
To: planning@berkeley.edu

Hello! I am a current resident of Berkeley and like many residents, I'm very concerned about the growing threat of wildfires. I would like to urge (or even beg) you to please remove the highly flammable eucalyptus trees as a preventative measure. They're beautiful, but not worth losing the whole campus over! I10-1

Best regards,
Emily

--
Emily Pothast
[redacted]

Letter I11

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Planning Departmental <planning@berkeley.edu>

Draft EIR Comments: WVFMP

David Ying Wed, Aug 19, 2020 at 9:59 PM
[redacted]
To: planning@berkeley.edu

Hello,

As a 2019 UC Berkeley alum, I want to express my support for removal of eucalyptus trees from the UC Berkeley hill campus. Eucalyptus trees exacerbate fire risk, a danger that is obvious to everyone through our 4 consecutive severe fire seasons. An outbreak in the Berkeley hills would easily threaten not just the campus but the urban neighborhoods around it and thousands of lives. The eucalyptus trees also create environmental problems by suppressing native plant growth. They may be part of the campus' past, but for its present and future, it's time for the eucalyptus trees to go. I11-1

Thank you,
David Ying

Letter I12

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Planning Departmental <planning@berkeley.edu>

Draft EIR Comments: WVFMP

Scott Owades Thu, Aug 20, 2020 at 9:08 AM
[redacted]
To: planning@berkeley.edu

Hi, I just wanted to send a note requesting that you remove flammable eucalyptus trees from the Berkeley hills as soon as possible. They are non-native and highly flammable, and I can't think of a reason to keep them other than laziness. Please cut 'em down! I12-1

Thank you!
Scott Owades

Letter I13

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Planning Departmental <planning@berkeley.edu>

Public Comment on Hill Campus Wildlife and Fuel Management Plan and DEIR

Henry DeNero [redacted] Thu, Sep 3, 2020 at 9:55 AM
To: planning@berkeley.edu

Dear Sirs and Madams,

I have reviewed the above referenced plan and Draft Environmental Impact Report and find this project to be an exemplary effort to mitigate fire risk in an environmentally sound manner. Congratulations. I13-1

Henry DeNero

Letter
I14

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Planning Departmental <planning@berkeley.edu>

comment on draft EIR and WVFMP

1 message

Sara Baldwin [redacted]
To: planning@berkeley.edu

Mon, Sep 14, 2020 at 12:49 PM

I recently purchased a residence at [redacted] Mosswood Road and am embarking upon an ambitious renovation effort this week. While efforts to remediate future flammability are much appreciated, I am concerned about several aspects of the proposal (the document I read seems rather vague). I14-1

1. Should herbicide be used in Strawberry Canyon where it can leach into the creek? What sort of parameters exist for this remedy?

2. I just invested a **huge** amount of money in this home, primarily because of the amazing view into the canyon, especially of the live oaks. How exactly will this view change? How will it affect the value of my property?Where are the firebreaks being located? I'd like to see a detailed plan and map. I14-2

3. I am concerned about the abundant wildlife being displaced by too much of an area being burned at the same time. In the two weeks that I've owned the property, I've seen turkeys, gray foxes, huge deer, etc. in my yard. I'm delighted to have them, but I'd rather not have them fleeing for their lives into my yard. I14-3

In summary, I am worried about potential threats to the value of my home and to my peace and quiet from an overly aggressive approach and will feel more comfortable if I can access a more detailed plan and map. I14-4

I, Sara Baldwin, grant UC Berkeley to read my comments aloud.
Sincerely,
Sara Baldwin

Sara Baldwin
Founder, Local Scoop
LocalScoop.com
[redacted]
Eastville, VA 23347

Letter I15

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Planning Departmental <planning@berkeley.edu>

Draft EIR Comments: WVFMP

1 message

isis feral [redacted] Mon, Sep 14, 2020 at 10:33 AM
To: UC Berkeley Planning <planning@berkeley.edu>

My name is Isis Feral, and I request and give permission that my comments be read aloud at tonight's public comment session. Receipt requested. Thank you.

My comments:

This Plan does not protect life, but increases fire danger, threatens public safety, and contributes to ecological devastation.

The scientific consensus about climate and air quality is that we need every tree we can get. Too many trees have already been removed in the East Bay hills, and continue to be, largely because of nativist ideology turned into policy:

The EIR continues to perpetuate the myth that non-native trees are greater fire hazards than native ones, when this is not always true, and more importantly, all trees contribute to fire safety, no matter their origin: trees do not catch fire easily, and they provide moisture and windbreaks that help prevent the spread of fire. I15-1

Applying nativist ideology to fire safety contradicts that we live in a natural wildfire zone where native species evolved fire dependent, and are threatened with extinction by fire prevention itself, as well as herbicide use and human development, the very activities this ideology and this EIR promote.

Human-built structures are far more flammable, "high hazard fuels" than any trees. The Oakland-Berkeley Mayors Task Force that investigated the 1991 hills fire concluded it was primarily houses that spread the fire, not any trees. Often houses set trees aflame, not the other way around.

Instead of vegetation management, what will make the hills fire safe is for any further development to stop. But UC has repeatedly shown it won't let environmental laws get in the way of killing every tree in its path to expansion:

The Hill Campus this EIR targets was one of several agencies' projects, already reviewed in FEMA's East Bay Hills EIS, which together would have destroyed half a million trees on thousands of acres on university, park district, and Oakland land. Under the guise of fire hazard mitigation, UC attempted to appropriate public emergency funds for this same development scheme it continues to propose across multiple EIRs. I15-2

In 2014, before the EIS was finished, UC illegally clearcut Frowning Ridge, another of the proposals to FEMA. In 2016, UC's projects, including Hill Campus, were stopped in court by hills residents, as was the addendum to the previous LRDP EIR with which UC tried to sneak the project past CEQA.

This EIR offers no "Alternative" that protects the forest. The "No Project Alternative" would continue the deadly activities UC has been engaging in for years, killing trees and spreading toxic chemicals. Alternative A promotes more of the same.

Alternative B is considered the "Environmentally-Superior Alternative", because all vegetation management would be manual, and would eliminate the use of herbicides, which many of us have been demanding on all UC land for decades. I15-3

But a long overdue pesticide ban would come at a monstrous price if it required the removal of so-called "small diameter" trees, the younger generations of trees, from the forest community.

I support none of the proposals in this EIR, and demand a "No-Project-At-All Alternative" that ends all of UC's ongoing deforestation and pesticide activities.

Letter I16

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Planning Departmental <planning@berkeley.edu>

UC Berkeley Hills Campus Wildland Vegetative Fuel Management Environmental Impact Report - Public Comment - modified

1 message

Anastasia Glikshtern [redacted]
To: planning@berkeley.edu
Mon, Sep 14, 2020 at 8:28 AM

Dear Sir/Madam,
My name is Anastasia Glikshtern.
I grant permission to UC Berkeley to read my comments aloud.
I'd like to resubmit my comment – removing support for No Project Alternative - because No Project means continuation of what's happening now: mature so-called "exotic/invasive" tree removals and herbicide use. Thank you. I16-1

I.
The "targeted ground application of herbicides" proposed by the EIR is unacceptable.
As a science organization you should know that they must not be used anywhere on Earth:

- They are more toxic, more persistent, more mobile and more dangerous than their manufacturers disclose;
- Numerous scientific studies associate exposure to herbicides with cancer, developmental and learning disabilities, nerve and immune system damage, liver or kidney damage, reproductive impairment, birth defects, and disruption of the endocrine system;
- There is no safe dose of exposure to those chemicals because they persist in soil, water, and animal tissue, so even low levels of exposure could still accumulate and harm humans, animals, and the environment;
- Especially vulnerable individuals include infants, children, pregnant women, the elderly, people with compromised immune systems and chemical sensitivities; I16-2
- Toxic runoff from herbicides pollute streams and groundwater, and therefore the drinking water sources;
- Herbicides are harmful to pets and wildlife – including threatened and endangered species, plants, and natural ecosystems;
- Herbicides are harmful to soil microbiology and contaminate soil into the future, reducing biodiversity in sensitive areas.

People have a right not to be involuntarily exposed to herbicides in the air, water or soil that inevitably result from chemical drift and contaminated runoff.

II.
As all recent catastrophic fires clearly demonstrated so-called "native" species are as flammable as so-called "exotic invasive species".
So-called "restoration" is actually the destruction of existing habitat.
Even though the so-called "native" trees are selected by staff – it doesn't mean they wouldn't burn. They are as much – or more - fire hazard as the big, mature, healthy "exotic" trees being mindlessly killed. And, of course "native" grasslands and shrubs burn best.

This plan for fire prevention is more likely to cause fire than prevent it. I16-3
Every tree killed increases the heat and dryness, and eliminates moisture that prevents fire. With elimination of trees there is more wind - another major fire problem.
We need every tree we can get, particularly the species that are most drought resistant, including Eucalyptus, Acacia, and Douglas Fir. The fog drip from these long-lived trees keeps some of the understory green year round.
Keep the trees. Ban herbicides.

Letter I17

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Planning Departmental <planning@berkeley.edu>

Draft EIR Comments: WVFMP

MARG HALL [redacted] Mon, Sep 14, 2020 at 12:00 PM
To: "planning@berkeley.edu" <planning@berkeley.edu>

I give permission for you to read my comments below at the public meeting tonight. I object to the fact that this public hearing was set up in such a way to exclude our real voices. Zoom? Webinar? I17-1

The loss of even one mature, healthy tall tree is a tragedy. Both humans and non human beings need trees. Trees are essential to the future of our planet. UCB has demonstrated a callous disregard for this reality. This draft EIR carries on that tradition. It shamelessly promotes the lie that native plants are somehow less fire prone. It fails to understand the need to PLANT new trees, species of trees that will have a future in a warming drought plagued California. Eucalyptus trees have a good chance of survival here long term, but some (quote) “native” trees do not. We shouldn’t cut them down. Fuel breaks, evacuation routes and areas of refuge could benefit from the preservation of shade trees. I17-2

I support alternative plan B with this modification: develop reforestation plans including preservation of some of the small eucalyptus trees. Two of the downsides of alternative B mentioned in the draft can easily be addressed. Hazardous trees in danger of imminent failure can be removed on an individual basis, providing there is careful vetting to ensure that such a determination isn’t based on outright prejudice against a specific species (ie eucalyptus). Using hand labor for maintenance isn’t a problem because people need jobs and this is important work. We must find a way to live without using pesticides. I17-3

Western wildland/urban fires are terrifying. I support vegetation management that is both based on science and respect for trees. We can and must do both. I17-4

Submitted by
Marg Hall, Berkeley CA

Letter I18

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Planning Departmental <planning@berkeley.edu>

Draft: EIR Comment WVFMP

[redacted] Mon, Sep 14, 2020 at 11:55 AM
To: planning@berkeley.edu

I am resending as I missed several errors in my haste. Please ignore my first letter and substitute this. thank you.
Mary Suje Meads

From: [redacted]
To: planning@berkeley.edu
Sent: Monday, September 14, 2020 11:23:20 AM
Subject: Draft: EIR Comment WVFMP

A commentary on the issue of public of trees and poisons:

The poisons themselves are extremely dangerous to humans who might be nearby or in the way of the wind; likewise for all wildlife, especially birds; long-term damage to soil, and an increase in public health issues such as asthma, cancers, and other ailments.
The poisons are much more dangerous than mentioned often in their labels because they build up in the soil over time and usually applicators use these poisons frequently, thereby being exposed more. Poisons also get blown by the wind into areas they should never have gone. I18-1

That being noted about poisons, we must keep the trees themselves: It has been shown that living trees rarely catch fire as the trunks are moist, thus repelling flames. Less fire resistant (none in fact) are the dry grasses that result from the loss of the tree canopy, which in addtion to fog drip (especially from the very tall trees) is the loss of cooling shade. Trees are a "carbon sink" that take in the heavy air and expel cleaner air (photosynthesis), a refuge for wildlife, have roots to stabalize soil on hillsides to reduce mudslides and flooding. Our climate is changing as we can observe by the increase of wildfires all over this state, but destroying the very trees developed in drier climates (such as the Austrailan transplants) is foolhardy at best and dangerous at most. More often it is the structures built near the forests that burn the fastest. The wildfire prevention plan therefore should concentrate on structures being built with more fire resistant materials such as tile roofs instead of wood shingles. Perhaps they shouldn't be built near the wildlands at all. In short the destruction of trees needs to stop. Instead, more trees must be planted. It takes many years (20+) for trees to mature, so replanting trees, while necessary for a safer future, is not going be very helpful for a significant period of time, so existing trees must remain. They are our saferty net. Trees in the way of fire, whose bark has been singed do not need to be destroyed either as they are healthy inside (an observation of seeing dozens of cut logs piled up) and many have proven their ability to survive fires and continue living. It would be wonderful if the UC planners could actually read up on the subject and pay attention to what is actually needed rather than blindly destroying areas to appease ignorant people or their need for continued building. The best plan is to leave the hillsides (whats left) alone--keep the trees, plant more, and stop using poisons. I18-2

[Quoted text hidden]

Letter
I19

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Planning Departmental <planning@berkeley.edu>

Additional Comment

1 message

Henry DeNero [redacted] Tue, Sep 15, 2020 at 10:17 AM
To: UC Berkeley Planning <planning@berkeley.edu>
Cc: Henry DeNero [redacted]

Dear Sirs and Madames,

Having listened to the public comments regarding the DEIR to mitigate fire risks in The Hill Campus, I have the following additional comments:

1. Regarding the objections to the removal of trees, since your plan will remove trees only or essentially only in areas designated as fire breaks, it seems that you will achieve significant fire risk reduction without removing the vast majority of trees in The Hill Campus. Notwithstanding the arguments that trees reduce carbon in the atmosphere and contribute to ground moisture, it seems reasonable that narrow bands of trees be removed at the boundaries of a very large area to create a defensible space to stop a fire from spreading into or out of The Hill Campus. I19-1

2. Regarding the objections to the use of herbicides, I would agree that herbicides should not be used if at all possible. If ongoing maintenance can be used as a means of preventing re-growth of trees in areas where they have been removed, this would be a preferred alternative to the use of herbicides. I19-2

Thank you for adding these comments to the public record. I continue to believe that you have developed a good plan to mitigate a significant risk at a reasonable cost. I19-3

Henry DeNero
[redacted]
Berkeley, CA 94709

Letter I20

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Planning Departmental <planning@berkeley.edu>

My comments for the UC Berkeley Hills Campus Wildland Vegetative Fuel Management Environmental Impact Report

1 message

Bev [redacted] Fri, Sep 18, 2020 at 3:36 PM
Reply-To: Bev [redacted]
To: "planning@berkeley.edu" <planning@berkeley.edu>, Bev [redacted]

I am Bev Von Dohre and I grant permission to UC Berkeley to read my comments aloud.

Dear UCB,

I am concerned that this plan for fire prevention is more likely to cause catastrophic fire than prevent it. If we eliminate the money to be made from killing trees and poisoning the environment, then there is no rational reason for most of this plan.

Every shrub or tree killed increases the heat and dryness, and eliminates moisture that prevents fire. Plus, the more areas are opened up, the more they are inviting the main cause of fire: arson.

Wind is another major fire problem, so why open our lands to more sun and wind?

The most at risk environment for fire are the open grasslands. We are told that most of the East Bay was rolling hills, but the original huge Redwood forest once extended to Moraga and Lafayette. I20-1

As our native oaks are dying, we need every tree we can get, which includes the species that are most drought resistant, including the maligned but fire resistant Eucalyptus, Acacia, and native Douglas Fir (who tolerates cold, heat and rain, and happily grows with both Redwoods and native Pinus Sabinia in drier areas.) The fog drip from these magnificent long-lived trees keeps some of the understory in the East Bay green year round. After some of our most fire-ravaged areas, the Eucalyptus were unscathed and helped protect buildings. (Friends in the 1991 hills firestorm credit Eucalyptus with saving their homes.)

Another serious problem is pesticide use that contaminates the earth, air, and water. No amount is safe, and if those advocating the use were the ones who actually got lymphoma and other cancers, they would likely ban it. It is already in all of our bodies, and contaminating ground water. It also pollutes where it's manufactured. Glyphosate has helped make the problem of toxic algae in our water ways. There is no excuse ever to use pesticides. I20-2

The use of heavy machinery listed in your plan also does tremendous harm, leaving trees and shrubs more flammable, and compacting the earth. Machinery also causes fires and poisons the land with oil, fuel, and other toxic materialx that then washes into the creeks, and into the bay. One local agency even says: "Service and fuel heavy equipment only in areas that will not allow grease, oil, fuel, or other hazardous materials to pass into streams or retained vegetation. Remove from the site and properly dispose of all refuse, litter, trash, and non-vegetative debris resulting from vegetation treatment operations; Ensure that hazardous materials spill kits are available on all heavy equipment." How about not doing any of this? I20-3

Instead of so harming the environment, killing countless animals, and increasing fire risk, plant trees until the land is protected by a dense, moist forest? I suggest the versatile, long-lived, fast-growing Douglas Firs that can reach the height of Redwoods and who can water themselves from the fog drip they bring down. They are ideal for Berkeley. I20-4

Bev Von Dohre

Letter I21

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Planning Departmental <planning@berkeley.edu>

UC Berkeley Hills Campus Wildland Vegetative Fuel Management Environmental Impact Report - Public Comment

kate bernier [redacted] Sat, Sep 19, 2020 at 10:52 AM
To: "planning@berkeley.edu" <planning@berkeley.edu>, Councilwoman Rashi Kesarwani <rkesarwani@cityofberkeley.info>, Jesse Arreguin [redacted]

Hello,

Some time ago I found a gov ? website (don't remember if it was gov't) that linked agent orange pesticide application in Vietnam to grass fires, a phenomenon unheard of in tropical environments such as Vietnam. The website was taken down overnight. Pesticides and synthetic fertilizers, which the City of Berkeley at some point in the last decade switched over to (synthetic fertilizers), contribute to the formation of crippling toxic blue green algae in water supplies globally. At the very least pesticide application kills healthy soil. I21-1
Kate Bernier

----- Forwarded Message -----
From: 'isis feral' via Coalition to Defend East Bay Forests <eastbayhills@googlegroups.com>
To: Organizing List <eastbayhills@googlegroups.com>
Sent: Monday, September 14, 2020, 02:34:40 AM PDT
Subject: [EastBayHills] Fw: UC Berkeley Hills Campus Wildland Vegetative Fuel Management Environmental Impact Report - Public Comment

From Anastasia, who works with the San Francisco Forest Alliance:
[Quoted text hidden]
--
.
READ UP ON THE ISSUE:

Good Overview and Resources:
http://www.saveeastbayhills.org/

The Science:
http://milliontrees.me/

History and Toxicology:
http://www.eastbaypesticidealert.org/wpad.html

The Lawsuit and More History:
http://hillsconservationnetwork.org/

Activism Art and More Science:
http://treespiritproject.com/sfbayclearcut/

Forest Photos and More Science:
http://bapd.org/treenotes.html

Sheryl Drinkwater
architect

Letter
I22

September 21, 2020 Delivered via Email: planning@berkeley.edu

Subject: Draft EIR Comments:
UC Berkeley, Physical & Environmental Planning
Attention: Raphael Breines, Senior Planner
300 A&E Building
Berkeley, CA 94720-1382

Re: Support for UC Berkeley Wildland Vegetative Fuel Management Plan

Dear Mr. Breines:

As a City of Berkeley resident, I support the University of California, Berkeley's Wildland Vegetative Fuel Management Plan (WVFMP), Draft Environmental Impact Report and Appendices.

I support the four implementation treatment types and five vegetation treatment activities identified in the plan as compatible with the regional approach. The identified projects and their ongoing maintenance plans are critical to reduce wildfire hazards in the East Bay. The projects' locations make them an important link in the chain of fuel reduction projects throughout the East Bay hills protecting not only the campus, but also the residents of Berkeley, the City of Oakland, East Bay Municipal Utility District's critical San Pablo watershed and East Bay Regional Park Districts' environmentally sensitive parklands. I22-1

I encourage the University of California to finalize the Draft EIR and begin implementation.

Sincerely,

Sheryl Drinkwater
Resident of Berkeley, CA
DFSC board member

Letter I23

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Planning Departmental <planning@berkeley.edu>

DRAFT EIR comments: WVFMP

1 message

Tamia Marg [redacted] Tue, Sep 29, 2020 at 10:48 AM
To: planning@berkeley.edu

Dear Raphael Breines,

As a private landwoner with around 1000 feet of shared property line with UCB in the hills campus (represented approximately by the red line in the photos below), I am always appreciative of all the work that UC operations has done on your side of the fence. However, I am hopeful that the extreme vegetation buildup on UC's side of our fence can be mitigated within 100 feet of structures, stated as UC's intention. I have been observing vegetation on UC's side of our fence becoming more dense every year so that impenetrable thickets are pressed against our fence next to our managed landscape and structures. See the Google Earth images below from 2004, shortly after UC completed euc removal in that area; in 2007, when vegetation was still open but beginning to move back in; and the most current readable image from Google Earth in 2019, in which vegetation has been well managed near Grizzly Peak Blvd (where I know ignition threat is the highest), but not within 100' of structures further down the hill. I23-1

Furthermore, I would like to point out that both during the 1970 and the 1991 fires, a dozer line was put in along our mutual property line under the duress of emergency as it appeared to be the best place to prevent fire from traveling from Gwin Canyon further north into Claremont Canyon. Both times those lines became the northern extent of the fire. While Joe McBride's plan presents a fire break along the entire UC property line from Grizzly Peak Blvd to Claremont Ave, I believe it is the uppermost portion that is the most prey to a wind-driven fire and would be a valuable focus for your plan. I23-2

Other comments:

My understanding about SOD in our area (from Garboletto) is that pruning oaks should happen when a period of a couple of months can be anticipated without rain so that wounds can heal and be less vulnerable to the pathogen when moisture is present. I23-3

In my experience, grass and other flashy fuels will often regrow after June 15 given sufficient fog drip. Flashy fuels should be mowed in a timely way so regrowth will not be substantial after cutting back. I23-4

Better proofreading is needed in places. A couple things caught my attention— I23-5

1/4 not 1.4 mile:

Garlon 4 not 14:

Finally I would like to encourage UCB to move forward with creating a more firesafe hills environment. Given the acceleration in fire activity in California, delay is not an option. For the record, I wholeheartedly support the use of appropriately applied herbicides to control eucalyptus. As one who has worked decades to reduce our eucalyptus grove, I know that it cannot be done effectively without herbicides. Also, I support the use of periodic controlled burns to reduce vegetation, and would be happy to work with UC on hardening our side of the fence in anticipation of such a practice. I23-6

Thank you for your efforts. We are all in this together.
Sincerely,
Tamia Marg
[redacted]

5 attachments

- **UCB:Marg property line 1:31:2004.png** 541K
- **UCB:Marg property line 5:31:2007.png** 548K
- **UCB:Marg property line 6:20:2019.png** 534K
- **PastedGraphic-2.pdf** 55K
- **PastedGraphic-3.pdf** 48K


Image U.S. Geological Survey
Imagery Date: 1/31/2004
37°52'04.76" N

I23-7

I23-7
cont.

Flame Length (Figure 12)

As shown on Figure 12, almost half of the 800-acre Plan Area is expected to burn with flames longer than 8 feet (330.55 acres), indicating direct attack methods would not be appropriate, and that indirect suppression would be necessary. Land that is expected to burn with flames between 4-8 feet in length totals 219.72 acres, and the area that is expected to burn with low flames lengths, shorter than 4 feet, totals 36.97. In the Plan Area, 181.47 acres is not expected to carry fire, due to the lack of vegetative fuel.

Long flame lengths are associated with forested areas with a dense understory of shrubs and short trees, as well as in stands of thick, dense shrubs. The areas of longest flame length are located in the higher portion of the Hill Campus: northeast of LBNL, surrounding the Botanical Garden, throughout Hamilton Gulch, as well in in Claremont Canyon. Areas of shorter flame lengths are located in areas where a dense forest canopy overstory is present over a thin leaf litter of surface fuel. These areas are found in the western portion of the Plan Area, in lower Strawberry Canyon, in the Botanical Garden, on the southern side of Claremont Canyon, and atop Chaparral Hill.

Rate of Fire Spread (Figure 13)

Fast-moving fires are those where the rate of spread is greater than 20 chains[9] per hour (or a 1.4 mile per hour); a total of 282.29 acres in the Plan Area is expected to burn in this category of spread rates. The rate of fire spread in almost 300 acres is expected to be slow to moderate, or 1 to 20 chains/hr. Fire spread is not expected or barely moving in 189.21 acres. The slower spread rates in the Plan Area are found in lower Strawberry Canyon and south of Claremont Avenue, and on Chaparral Hill. Fast-moving fires are expected north of the Botanical Garden, north of Claremont Avenue, and on the west-facing slope of Frowning Ridge. I23-8

fencing, mineral block, supplemental food and/or a watering site to keep the animals within the desired area. In addition, portable electric fencing is typically used for prescribed herbivory.

Prescribed herbivory is not new to the Hill Campus; both Strawberry and Claremont canyons were dairy farms in the 1940s. Since the 1980s, goats were used to manage grasslands and shrublands in the Plan Area including below the Lawrence Hall of Science, Math Science Research Institute and FSSBER. Currently, a herd of goats is reducing fuel hazards in the 29-acre FSSBER managed by the Office of Laboratory Animal Care (OLAC); OLAC and Facilities Services have an agreement to graze four locations in the Hill Campus to evaluate the potential of this treatment.

[9] A chain is a unit of length equal to 66 feet, commonly used in surveying and forest operations. Conveniently, 80 chains is equivalent to a mile. Chain is abbreviated ch.

5.5 HERBICIDE APPLICATION

Herbicides are chemicals that damage or kill plants and are categorized as selective or non-selective. Selective herbicides kill only a specific type of plant, such as broad-leaved plants, which allows the herbicide to be used to control weeds while maintaining grass species. Other herbicides, such as glyphosate (Roundup®), are non-selective and kill any type of plant. UC Berkeley could use Garlon 4[12] or Garlon 3A (triclopyr) and Stalker[13] (imazapyr) Transline, Glyphosate, Snapshot, and Surflan, using cut stump or basal bark application, which are described below. UC has a rigorous review procedure regarding the use of Tier 1 herbicides and prohibits all other herbicides.

To prevent resprouting of removed trees, an herbicide solution will be applied by a licensed California Qualified Applicator to the cambium ring of eucalyptus and acacia stumps within three minutes of felling. The herbicide mixture will likely consist of a combination of Garlon 14 or Garlon 3A (triclopyr) and Stalker[15] (imazapyr) in a solution of methylated seed oil, water, and marking dye. If application within 60 feet of running or standing water is necessary, Garlon 3A will be used, which is approved for use near aquatic areas. A typical tree requires 1 to 2 ounces of diluted solution. Foliar spray with a hooded spray wand is also considered. I23-8 cont.

Use of herbicides will be subject to the restrictions described on the product label, specified in the recommendation by the Pesticide Control Advisor, and by the 2014 Final Hazardous Fire Risk Reduction Environmental Impact Statement East Bay Hills, California.

5.5.1 CUT STUMP APPLICATION

To maximize the efficacy of treatment the tree must be cut leaving a stump not more than four inches in height above soil surface and the cut surface of the stump must be treated with an herbicide within minutes of the cut. The herbicides applied to the outer portion of the cut surface, including the cambium of the tree. The herbicide is translocated to the roots and disrupts the transportation of nutrients and water, causing the plant to die.

5.5.2 BASAL BARK APPLICATION

[12] Garlon is a registered trademark of Dow AgroSciences.
[13] Stalker is a registered trademark of BASF.
[14] Garlon is a registered trademark of Dow AgroSciences.
[15] Stalker is a registered trademark of BASF.

Letter I24

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Planning Departmental <planning@berkeley.edu>

Draft EIR Comments: WVFMP

1 message

Joe R. McBride [redacted] Fri, Oct 2, 2020 at 11:22 AM
To: Planning Departmental <planning@berkeley.edu>

TO: Physical & Environmental Planning, UC Berkeley

From: Joe R. McBride, Professor Emeritus, ESPM and LAEP, UC Berkeley

RE: Draft EIR Comments:WVFMP

Attention: Raphael Breines, Senior Planner
300 A&E Building, Berkeley, CA 94720-1382

Dear Mr. Brienes:

I have reviewed the EIR for the proposed WVFMP and would like to direct your attention to the following concerns I have about the EIR:

Section 3.12 (Wildfire) of the EIR evaluates the effects of the implementation of WVFMP implementation on wildfire and wildfire-related risks. I believe that the analysis is inadequate for the following reasons:

1. The analysis uses fire behavior modeling to determine fire characteristics (flame length, rate of spread, ember casting, etc.) and areas burned based on the Landscape Fire and Resource Management Planning Tools Project (LANDFIRE Version 1.40) and fuel models that were based on LANDFIRE data on August 29, 2019 (see WVFMP Figure 11). This data represents the fuel conditions prior to the proposed treatments under the WVFMP. It does not really evaluate the impact of the proposed treatments which would require a modification of the fuel model after the treatment and re-running of LANDFIRE Version 1.40. The impact analysis only assumes that the treatments will result in a more fire safe situation without really testing the treatments using the model. I24-1

2. The vegetation Map (WVFMP, p.34 - Figure 10. Current vegetation types, from 2016 LandFire data) incorrectly identifies several vegetation types. For example, see maps below:
A close up of a map Description automatically generated

This misidentification affects the results of the fire models. Eucalyptus plantations have much larger fuel loading, exfoliating bark, and aromatic compounds in the leaves which contribute a much greater fire danger, greater fire line intensity, greater propensity to torching and crown fires, and greater production of embers that can cause more spot fires than California Coastal Live Oak Woodlands. Baccharis brushland, on the other hand, presents much less fire hazard than Southern California Dry Mesic Chaparral. I24-2

3. The plan is focused on the area of land in Strawberry Canyon, Claremont canyon, and at the Smyth-Fernwald area (referred to as the Hill Campus - Plan Area) and evaluates environmental impacts in terms of acres potentially burned in this area of land. Future fires will not stop at the boundaries of University property but under highly probable fire weather condition they will burn onto adjacent private or agency owned property. To suggest that the planned fuel management treatments will reduce the areas burned in different types of fires (crown vs surface fires) or reduce the flame length or spotting distance does not really address the impact of fires starting in highly flammable vegetation in the Hill Campus – Plan Area adjacent to private property along Panoramic Way and adjacent to the Lawrence Berkeley Lab property. These areas are particularly vulnerable to fire that can burn from eucalyptus and/or conifer plantation immediately adjacent to them on University property. I24-3 Limiting the impact analysis, the Hill Campus – Plan Area does not completely evaluate the impact of the proposed plan. In the EIR the exposure of people to toxic air contaminants emitted by prescribe burning is addressed (Page E-8) and mitigation measures identified. This exposure is not limited to people who might be in the Hill Campus – Plan Area during prescribed burning, but to all people within the drift zone of the smoke created by the prescribe burns. Why was not such an expanded view taken in evaluating the wildfire impact? I24-4

4. The "Regulatory Setting section of the EIR evaluates plans, policies, regulations, or laws applicable to the WVFMP. Under CAL Fire no mention is made of CAL FIRE's instructions for creating defensible space, which includes ""Remove branches that hang over your roof..." (https://www.readyforwildfire.org/prepare-for-wildfire/get-ready/defensible-space/
The WVFMP (p. 18) states "Maintain at least 8 feet of vertical clearance between roof surface and overhanging portions of trees." This is in direct contradiction to CAL FIRE instructions. I24-5

5. The treatment proposed in Section 2.5.1 (p. 2-5) under "Evacuation Support Treatments" states: "Vegetation treatment for evacuation support would focus on removing (including pruning) all trees prone to torching up to 100 feet from either side of major evacuation routes that could potentially block access if they fall. In certain specific situations hazardous trees taller than 100 feet with the potential to fall on a roadway that are located further than 100 feet from the roadway may be removed."

This treatment will leave individual trees within the 100 feet of the evacuation routes that would be prone to falling onto and blocking the evacuation routes due to high winds during future fires. Trees that are growing in small clumps or in close approximation tend to buffer the wind as a group. When individual trees are left by the removal of trees around them, they are less wind firm and can be toppled by the wind. In view of current experience with high wind velocities driving wildfires in California, this impact should have been analyzed in the EIR. I24-6

The following references point out the susceptibility of trees to windthrow if they are exposed to wind following forest thinning:

Busby J.A. 1965. Studies on the stability of conifer stands. Scottish For. 19 : 86-102.

Cremer K.W., CJ. Borough, F.H. McKinnel and P.R. Carter. 1982. Effects of stocking and thinning on wind damage in plantations. N. Zeal. J. For. Sci. 12: 245-268.

Mitchell, S. J. 2012. Wind as a natural disturbance agent in forests: a synthesis. Forestry: An International Journal of Forest Research. Vol. 86 Issue 2: 147-157

Savill, P.S. 1983. Silviculture in windy climate. For. Abs., (Review article), 44: 473-488

6. In section 2.5.2 (p. 2-9) Description of Vegetation Treatment Activities the following statement occurs: "The treatment activity or activities selected would be those that are most likely to achieve the desired treatment objectives for the specific site, protect natural resource values, and meet the overall Plan objectives. During the planning phase for a vegetation treatment, the appropriate treatment activity or activities would be selected that best match the operational needs and treatment constraints on the landscape."

This statement does not specify the specific treatment that will be used in a given site. It seems, therefore, that the environmental impacts of the treatments cannot be analyzed. If at this point there are a given number of treatments (e.g., manual, mechanical, prescribed burning, managed herbivory, herbicide application) any of these could be chosen for use at a particular site. Without knowing what particular treatment will be used one cannot evaluate the environmental impact. I24-7

7. The analysis of Alternative A: The McBride Plan Alternative does not use the same tools (LANDFIRE Version 1.40) to evaluate the alternative. It dismissed that alternative on the basis of:

- „ No broadcast prescribed burning would be conducted.
  „ No temporary refuge areas would be developed.
- „ No chipping of biomass or reuse onsite would occur; accordingly, pile burning would substantially increase relative to the WVFMP.
- „ A 300-foot-wide non-shaded fuel break would be created on the ridgeline between Strawberry and Claremont canyons (the WVFMP includes a 126-foot-wide non-shaded fuel break that extends from Frowning Ridge to Claremont Canyon). I24-8
- „ Water tanks would be installed on Grizzly Peak Boulevard.
  „ An Alameda whipsnake preserve would be created on the upper south facing slopes of Strawberry Canyon.
- „ Fire roads throughout both Strawberry and Claremont canyons would be widened and graded to accommodate the Type 3 fire engines purchased.

These comparison between the McBride Alternative and the WVFMP overlooked the primary difference in the treatment of Eucalyptus. In the McBride Alternative all eucalyptus was proposed for removal and conversion to other types, while in the WVFMP not all areas of eucalyptus were proposed for treatment. This difference should have been evaluated by using the same tools as were used for evaluating the WVFMP. I24-9

I also feel that the dismissal of the proposals for wider fuel breaks along the ridgeline between Strawberry and Claremont canyons and along evacuation routes was dismissed without really addressing in any quantitative way the effect of the alternative on fire characteristics. Ember production (maximum spotting distance) from conifer plantations along the ridgeline between Strawberry and Claremont canyons and the Panoramic private property development range from 500 to 2,000 feet (p. 56 - Figure 22 – WVFMP). This creates a significant problem for the homeowners in the Panoramic development that could be avoided by the ridgeline treatment of conifer plantations proposed in the McBride Alternative. I24-10

The analysis of Alternative A (McBride Plan) did not apply the LANDFIRE Version 1.40 model to contrast the McBride Plan with either the existing conditions or the WVFMP. Such comparisons should have been done before Alternative A was rejected. I24-11

Thank you considering these comments,

Joe McBride

Letter I25

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Planning Departmental <planning@berkeley.edu>

Draft EIR Comments: WVFMP. UC Berkeley Hills Campus Wildland Vegetative Fuel Management Environmental Impact Report - Public Comment

1 message

Bev [redacted] Sun, Oct 4, 2020 at 7:16 PM
Reply-To: Bev [redacted]
To: "planning@berkeley.edu" <planning@berkeley.edu>

Dear UC Berkeley,

I am concerned that your plan for fire prevention will cause catastrophic fire, not prevent it. I can't believe we are still trying to convince you to stop killing trees and spreading poison when the reasons to do so are already well known. There is enough cancer and chronic illness and pollution already and never enough trees to help protect us from fire and heat, as well as improve our health. If the money motive from from killing trees and poisoning the environment were removed as incentive, there is no rational reason for most of this plan.

Every shrub or tree killed increases the heat and dryness, and eliminates moisture that prevents fire. Plus, the more areas are opened up, the more they are inviting the main cause of fire: **arson.**

The densest forests are the safest, which is why the 1991 Oakland fire never went into the parks. When trees are removed, then highly flammable poison hemlock, thistles, and grasses replace them, which UC Berkeley should know from experience after cutting trees down. The heat intensifies too. Using grazing to control grasses is the best plan for the most flammable plants, but only if they don't kill young trees and large shrubs. Removing small, young trees destroys the ecosystem where having all stages of tree growth present is healthiest.

Wind is a major fire problem, so why open our lands to more sun and wind?

The most at risk environment for fire are the open highly flammabe grasslands, which dry out quickly and with nothing to stop the wind.. We are told that most of the East Bay was rolling hills, but the original huge Redwood forest once extended to Moraga and Lafayette. That forest affected the entire East Bay, in increasing creeks that flowed year round to the bay (unlike now, where they soon dry up), helping prevent wildfire. I25-1

As our native oaks are dying, we need every tree we can get, which includes the species that are most drought resistant, such as the maligned but fire resistant Eucalyptus, Acacia, and native Douglas Fir (who tolerates cold, heat and rain, and happily grows with both Redwoods and native Pinus sabinina in drier areas). The fog drip from these magnificent long-lived trees keeps parts of the understory in the East Bay green year round. Areas that have only Monterey Pine also keep grass underneath green, which can be see in the East Bay hills even now.

After seeing the aftermath of our previous fire-ravaged areas, most Eucalyptus were unscathed and acted as windbreaks, protecting buildings. (Friends in the 1991 hills firestorm credit Eucalyptus with saving their homes.) They are also the preferred nesting tree for raptors, from eagles to owls to hawks, as well as for many other birds. Monarch butterflies now depend on them for survival. (If not planted together, they do not spread and make a diverse ecosystem with other trees, which I can show you, if you'd like.)

There is no excuse ever to use pesticides/herbicides. These poisons contaminate the earth, air, and water. No amount is safe, and if those people advocating the use were the ones who actually got lymphoma and other cancers from them, they would ban them. Glyphosate is already in all of our bodies, as well as our ground water. It also pollutes where it's manufactured. Glyphosate has helped cause the toxic algae in our reservoirs, lakes and creeks, as well as making sprayed areas more flammable. I25-2

The use of heavy machinery listed in your plan also does tremendous harm, leaving trees and shrubs more flammable, and compacting and damaging the earth. Machinery also causes fires and poisons the land with oil, fuel, and other toxins that then washes into the creeks, and into the bay. One local agency even says: "Service and fuel heavy equipment only in areas that will not allow grease, oil, fuel, or other hazardous materials to pass into streams or retained vegetation. Remove from the site and properly dispose of all refuse, litter, trash, and non-vegetative debris resulting from vegetation treatment operations; Ensure that hazardous materials spill kits are available on all heavy equipment." How about not doing any of this? I25-3

Instead of so harming the environment, killing countless animals, and increasing fire risk, why not plant trees until the land is again protected by a dense, moist forest? I suggest the versatile, long-lived, fast-growing Douglas Firs that can reach the height of Redwoods and who can water themselves from the fog drip they bring down. They are ideal for Berkeley. I25-4

Bev Von Dohre

Letter I26

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Planning Departmental <planning@berkeley.edu>

Urgent: Stop Razing Healthy Trees when Conservation is needed!

1 message

Ariane Eroy [redacted] Mon, Oct 5, 2020 at 3:19 PM
To: planning@berkeley.edu

At a time when human-driven climate changes ravage this planet, we find men woefully complacent or disinformed about the dangers besetting all life on this planet, as well as the life of the Planet itself, a living being.

Locally, in the San Francisco Bay Area, the Cities are rapidly thinning and clearing away some of their oldest trees, Eucalyptus trees. These trees were planted intentionally over a century ago, and must be considered part of the historic legacy of the Bay Area, gracing our hills and largest urban forests.

These are some of the most spiritually evolved of all trees, living in the most austere environments, thriving in non-arable soils under drought-like conditions, living off fog, and bestowing shade, medicine and a forest-haven to both animals and stressed-out city-dwellers alike. Stoic, invisible and divinely generous, they clean our air of toxic particulates, they diminish the City's din and whipping winds, they sequester tons of carbon dioxide in their towering trunks and roots, and they lower the dangerously escalating temperatures of the Planet.

Yet these trees are demonized and denigrated: People even claim that the Eucalyptus "don't belong here", stating that these trees are "non-native" as they originate from Australia. But aren't all the complaints arising from Americans who have immigrated from other lands?

Nativists employ bigoted tropes and relentlessly aim to condition ordinary people to believe that these trees are dangerous or "invasives" --even while humans number over 7 billion, and threaten all life on the Planet! (Certainly this must be considered an act of projection of our unwanted characteristics onto others--in this case, onto other life forms that have different ways of knowing and being). I26-1

People insist that these trees are "inflammatory", even though no plant nor animal, nor building, is impervious to fire. These majestic trees are blamed for forest fires, fires that are largely manmade, and ordinarily emerge out of native shrubs and grasses. (In the case of the 1991 Oakland Hills Fire, the Oakland Fire Department walked away from the fire while it lay nestling in the grasses. Twelve-hours later, the wind whipped up the embers, and instead of taking responsibility, the Fire Department blamed the trees.).

Let it be known: These vitally alive, drought-resistant trees work for us every day of their lives: They provide us with oxygen and are our silent comrades, invisibly fighting against catastrophic climate change. They are essential for the healing, and environmental protection of the Bay Area. Yet they are being felled in the tens of thousands by aggressive businessmen, greedy developers and money-worshipping speculators who claim we can continue an ethos of unsustainable and reckless expansion without end. University buildings will not give us oxygen!

What are these trees supposed crimes? The Eucalyptus are only 125 years old, but they can live to be 500 years old, if allowed to do so. They reside on highly coveted land.

These lands are part of the Commons, and as such, the forests belong to all of us.These trees are our neighbors. They are part of our communities. Each life is sacred, and each tree has a divine purpose to help save Humanity, from itself, from the lip of extinction upon which we all hover. Such forests belong both to the present and the future--should we hope to live!

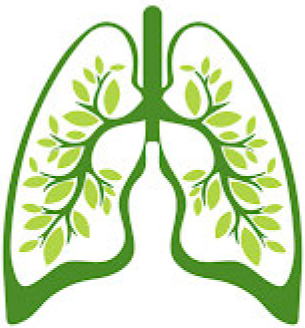
Sincerely yours,

Ariane Eroy, Ph. D.
Clinical Psychologist

[redacted]
San Francisco, California 94146

"Anything done outside of awareness leads to destruction."
Maitreya
London

2 attachments



PastedGraphic-1.png
375K

Climate March 2.20.19 Educational flyer.pdf
716K

SAVE Thousands of Trees on Mount Sutro Forest from Being Felled by UCSF

1. The fossil fuel companies and our government--with its institutions--aim to deflect responsibility from themselves. In order to thwart new laws and regulations, they convince Americans that the real change needs to be at the individual level, and that that should be adequate: That people need merely to recycle more, use screwy lightbulbs, or refuse plastic straws. We need to expose this fallacy--that it is our government, our corporations, and our institutions that need to stop deflecting responsibility. Public policies must be changed. Lifestyle changes are insufficient.

2. Forests that are destroyed can not be replaced. These are living ecosystems, and when these trees are killed, something invaluable is lost--in terms of what towering trees give us. We need the courage to speak up as they are our silent soldiers fighting on our side to save the planet. Truly our lives are dependent on theirs. Naomi Oreskes, the bestselling *New York Times* author of *Merchants of Doubt,* has identified fossil fuel usage and deforestation as the 2 major factors accelerating catastrophic climate change.

3. The communities that emit the least pollution are hit the hardest when it comes to the climate emergency. This is part of the reason why we need an objective discussion of what needs to be done--not leaving it to those with the least resources and the least resiliency to come up with solutions. We have a duty to help create policies that combat environmental racism. I26-2

"The Culture of creation is diversity, which is the basis of every nation and of every religion. Try to remove these differences and you only provoke destruction. You must respect the laws of diversity to maintain harmony or peace." [Maitreya, London]

4. Trump has dismissed Nixon & Reagan's environmental policies, despite their having addressed particulate pollution, mitigated ozone & acid rain. The White House has dismantled regulations on methane emissions--with methane being 85 times more potent a greenhouse gas than carbon dioxide and a product unleashed by fracking. Trump supports Brazil's development and decimation of the Amazon.

SAVE Thousands of Trees on Mount Sutro Forest from Being Felled by UCSF

5. At present, UCSF intends to radically thin San Francisco's largest urban forest on Mount Sutro. They are fragmenting the forest by creating "open spaces" and native gardens which can only invite disease and dangerously desiccate the forest floor. (Presently Mt. Sutro's forest is damp all year long from the fog, which makes it impervious to fire.) By degrading Mount Sutro, UCSF prepares the Forest for development. In order to accomplish such a feat, the University has partnered with Nativists, who have repeatedly used the corporate-controlled media to condition the Pubic to fear, if not hate, certain species of trees. Employing the same kind of bigoted tropes against Eucalyptus trees that have been used against Native Americans for centuries, Nativists hope we will fail to see the holes in their rhetoric, for they deny that their clearcutting agenda accelerates climate change. And while promoting the replacement of towering 125-year old trees with native shrubs and grasses, they aim to incite fear against forests themselves. Like many populist movements, they attempt to determine what species "belong here". And while they denounce certain species as being "dangerous" and "invasive", they ignore the fact that—at present—humans could be denounced as "invasive", as Humanity threatens all life on Earth! I26-2 cont.

6. Merely 100 companies are implicated in releasing 71% of global carbon emissions. They are endangering all life on the planet. As such, they need to be taxed, regulated and eventually closed down. We can boycott or diminish usage of fossil fuels, while embracing a future where green energy choices grow increasingly plentiful and accessible to all. Mount Sutro is our local version of the Amazon--will we permit thousands of its trees to be razed?

Let it be Known: These trees reside on public land and are part of our community. UCSF has plenty of space to install native gardens at Mission Bay, on the roof of Milberry Garage, or over its miles' of sidewalks. UCSF's buildings will never provide us with oxygen, nor sequester carbon dioxide. Please take a stand about our world's most pressing problems and help protect our largest urban forest from reckless development. Educate yourself at: **sfforest.org** .

Letter I27

Comments on the University of California Berkeley Hill Campus Wildland Vegetative Fuel Management Plan Draft Environmental Impact Report

Isis Feral
October 5, 2020

This may be the most honest UC Draft EIR I've seen, at least in so far that for once the alternatives offered are not merely slightly altered versions of themselves, but demonstrate more clearly two opposing sides of a political and scientific debate that has been ongoing for many years (I've personally been in the fray of it since early 2005).

I27-1

The so-called **"No Project Alternative"** is not, as one might expect, a ceasing of all vegetation management activity in the Hill Campus, but represents the established status quo of typical, routine UC Berkeley vegetation management practices, which includes pesticide use and removal of trees. **I oppose this option.**

"Alternative A - The McBride Plan Alternative" represents the ideology of nativist organizations, who irrationally vilify vegetation on the basis of origin, and fantasize about returning the East Bay landscape to an arbitrary point in recorded history, with a very different climate, by removing and poisoning most of the trees in the hills. **I oppose this option.**

I27-2

"Alternative B - The Reduced Treatment Alternative" incorporates the end of toxic pesticide use that has been demanded by environmental health activists, especially those of us who have suffered disabling pesticide injuries, for many years, but it still targets entire generations of younger trees for removal, and continues to do so based on species-specific prejudice. **I oppose most of this option, but support the trajectory of some of it.**

I27-3

Unfortunately the DEIR does not adequately address the political and scientific debate that is at the core of this process, and the attempt to summarize public comment - as opposed to simply including them verbatim and allowing us our own voice, ends up brushing aside the political aspects of our comments as not relevant to the CEQA process, and not worthy of acknowledgement.

I27-4

It should be reasonable to expect university experts to be familiar with all discourse in their field of expertise, and to be willing and able to discuss the contributions of others working in the field. But the work of experts I cited in my initial comments, and in comments I submitted to UC Berkeley many times over, has never been addressed in any of the university's environmental reviews I've participated in. The references in this DEIR are again one-sided, largely citing related agencies of continuously self-perpetuating bureaucracies, and no dissenting views are represented or discussed.

I know I was not the only one who urged authors of the EIR to especially consider the work of conservation biologist David Theodoropoulos, who wrote an important, and often cited critique and challenge of so-called "Invasion Biology", the pseudoscience that some of the actions in this DEIR are based on. I don't see him, or his colleagues who hold similar perspectives, cited or mentioned anywhere, except in the summary of our public comments. I even provided you with a link to a presentation Theodoropoulos gave to a full hall of local opponents of projects like the one discussed in this DEIR (in fact, including a previous iteration of this very project) (https://www.youtube.com/watch?v=n1i3RP7eDFc), as well as a link to where he can be contacted (http://dtheo.org/InvasionBiology.htm). I27-4 cont.

The plan outlined in this DEIR, and the vilification of so-called "non-native" species as the primary source of fire danger, are in large part based on false premises that are not grounded in science, a concern that should certainly be relevant to an environmental review commissioned by a university. I request again that authors of the EIR educate themselves about the political, scientific, and above all ecological fallacies of this long outdated and debunked myth of "Invasion Biology".

"Alternative A" is clearly described as "conversion" from the living forest that now occupies the Hill Campus to native vegetation. It is an aggressive native plant "restoration" project, that has nothing to do with fire safety, which is the stated purpose of this environmental review process, and should not be considered a legitimate proposal for protecting the East Bay from catastrophic fire events.

The "McBride Plan" follows a by now well established and deliberate pattern of panic mongering, of exploiting the public's fear of fire to push through ideologically based, unnecessary and destructive "restoration" projects. At the 2004 Symposium of Cal-IPC, the California Invasive Plant Council, it was reported in the archived notes of the Trees & Shrubs Working Group, that during a discussion about "Dealing with community opposition to weed removal projects" someone, citing the Golden Gate National Recreation Area (GGNRA) as an example, made the recommendation to "use threats of fire danger to help build support for invasive plant removal projects" (page 98, http://www.cal-ipc.org/docs/symposia/archive/pdf/18854.pdf). I27-5

It should be noted that Cal-IPC was started as the California Exotic Pest Plant Council (CalEPPC) in 1992 by representatives of various government agencies, environmental nonprofits, and the pesticide industry. Among its founding board members was Dr. Nelroy Jackson, Technical Development Manager for Monsanto, who helped develop glyphosate herbicides for "habitat restoration markets". Cal-IPC became the model for many more groups like it, which should be regarded as industry front groups, with priorities of profiteering, not of public or ecological health and safety.

This EIR is supposed to focus on protecting people from fire. Trees pose the least fire risk, and are considered a fire mitigation factor by professional firefighters. The greatest fire danger is posed by human development, not vegetation. Human infrastructure and activities are the primary cause of fire, including from electrical equipment, propane tanks, gas lines and gas guzzling vehicles, accidents, arson, and the exquisitely flammable tinder boxes people live and work in that are made of dead, dry trees and explosive fuels. That's where fire safety needs to be addressed. I27-6

UC has repeatedly indicated that as part of its ongoing expansion it plans to build more housing and infrastructure, and further encroach on the forest in the Hill Campus area. Since this DEIR continues to promote the same nativist fallacies that do not serve to protect the community from catastrophic fires, it it obvious that it is simply another ruse to push through development under the guise of public safety. I urge the authors of this EIR not to allow your work to be used for this purpose.

While I certainly support safeguarding our communities from catastrophic fires, I cannot support the means proposed in this DEIR.

I wholeheartedly support that "Alternative B" would eliminate the use of pesticides in this project, and I urge the university to follow this trajectory to its natural conclusion and ban all pesticide use on all UC campuses once and for all!

But I continue to oppose the removal of large numbers of trees. Targeting trees under 18 inches in diameter would allow eliminating the entire younger generations of trees in the forest community. If it were a human community so targeted we would call it genocide, and the implications of doing so to a forest are no less dramatic.

I27-7

Though some concerns I've brought up in previous comments may have been addressed to varying extent in this DEIR, I again include the short comments I submitted for the live online hearing on September 14, 2020, as well as my extended comments I submitted during the scoping period on December 20, 2019. I ask that all public comments received in this process be included in full in the Final EIR, so that they can contribute and facilitate much needed ongoing debate about these issues.

I27-8

Comments on the University of California Berkeley Hill Campus Wildland Vegetative Fuel Management Plan Draft Environmental Impact Report

Isis Feral
September 14, 2020

This Plan does not protect life, but increases fire danger, threatens public safety, and contributes to ecological devastation.

The scientific consensus about climate and air quality is that we need every tree we can get. Too many trees have already been removed in the East Bay hills, and continue to be, largely because of nativist ideology turned into policy:

The EIR continues to perpetuate the myth that non-native trees are greater fire hazards than native ones, when this is not always true, and more importantly, all trees contribute to fire safety, no matter their origin: trees do not catch fire easily, and they provide moisture and windbreaks that help prevent the spread of fire.

Applying nativist ideology to fire safety contradicts that we live in a natural wildfire zone where native species evolved fire dependent, and are threatened with extinction by fire prevention itself, as well as herbicide use and human development, the very activities this ideology and this EIR promote.

Human-built structures are far more flammable, "high hazard fuels" than any trees. The Oakland-Berkeley Mayors Task Force that investigated the 1991 hills fire concluded it was primarily houses that spread the fire, not any trees. Often houses set trees aflame, not the other way around.

Instead of vegetation management, what will make the hills fire safe is for any further development to stop. But UC has repeatedly shown it won't let environmental laws get in the way of killing every tree in its path to expansion:

The Hill Campus this EIR targets was one of several agencies' projects, already reviewed in FEMA's East Bay Hills EIS, which together would have destroyed half a million trees on thousands of acres on university, park district, and Oakland land. Under the guise of fire hazard mitigation, UC attempted to appropriate public emergency funds for this same development scheme it continues to propose across multiple EIRs.

In 2014, before the EIS was finished, UC illegally clearcut Frowning Ridge, another of the proposals to FEMA. In 2016, UC's projects, including Hill Campus, were stopped in court by hills residents, as was the addendum to the previous LRDP EIR with which UC tried to sneak the project past CEQA.

This EIR offers no "Alternative" that protects the forest. The "No Project Alternative" would continue the deadly activities UC has been engaging in for years, killing trees and spreading toxic chemicals. Alternative A promotes more of the same.

Alternative B is considered the "Environmentally-Superior Alternative", because all vegetation management would be manual, and would eliminate the use of herbicides, which many of us have been demanding on all UC land for decades.

But a long overdue pesticide ban would come at a monstrous price if it required the removal of so-called "small diameter" trees, the younger generations of trees, from the forest community.

I support none of the proposals in this EIR, and demand a "No-Project-At-All Alternative" that ends all of UC's ongoing deforestation and pesticide activities.

Comments on the University of California Berkeley Hill Campus Wildland Vegetative Fuel Management Plan Environmental Impact Report Scoping Period

Isis Feral
December 20, 2019

Many of my comments below are identical or similar to comments I previously submitted on the attempted Hill Campus Fire Risk Reduction Addendum to the 2020 Long Range Development Plan Environmental Impact Report (EIR), on March 22, 2016. Some I submitted prior to that, in my June 17, 2013 comments on the East Bay Hills Draft Environmental Impact Statement (EIS) for the Federal Emergency Management Agency (FEMA) Wildfire Pre-Disaster and Hazard Mitigation funding requested by the university, together with the City of Oakland and East Bay Regional Park District.

As the plans for this EIR are largely the same as the addendum, as well as the university's FEMA projects, which were both challenged successfully and stopped in court, I continue to oppose these proposed actions on the same basis as I did before.

The proposed actions do not accomplish the purpose stated in the Initial Study and Plan. They do not protect life, but instead increase fire danger, threaten public safety, and contribute to ecological devastation.

The Initial Study does not address the health and environmental hazards of removing large numbers of trees from the hills, and of spreading toxic pesticides. It also does not take into consideration the impact of other agencies that are cutting trees and applying poisons on connected lands.

Any vegetation management that requires an Environmental Impact Report under the California Environmental Quality Act is too drastic!

TOXIC CHEMICALS

Authors of the Initial Study claim that "herbicide use is currently limited", but what does that mean precisely? What pesticides are already in use now, and how would this Plan increase that use? Herbicides are proposed for every single "Identified Treatment Project" without exception.

It seems that there is really not even an inkling of understanding of how pesticides work beyond how they kill the intended target.

The Plan includes "various combinations of the treatment activities", but does not discuss that grazing and herbicide use should not be combined, because it harms the grazing animals.

There appears to be no concern about how these herbicides affect flammability, or what resulting fumes might endanger firefighter and the community when pesticided areas do burn.

There is no mention of air quality problems from herbicide applications. While we associate drift by air especially with spraying of chemicals, which is proposed in this Plan, drift also happens by water, soil, and contact. Drift occurs from all herbicide applications no matter the application method.

There is also no acknowledgement that herbicides do affect the loss of top soil, because they poison the soil and its organisms. They can also decrease groundwater supplies, since they have been found in watersheds and groundwater, and such poisoning obviously causes a decrease of usable groundwater.

Pesticides are hazardous to both human and ecological health. As is usually the case with pesticides, more hazards have been identified since the toxicological profiles at the following links were assembled from the research available at that time. Summarized are some of the specific dangers of the herbicides planned for use in this project:

Triclopyr
https://d3n8a8pro7vhmx.cloudfront.net/ncap/pages/26/attachments/original/1428423464/triclopyr.pdf

Triclopyr is the active chemical ingredient in products like Garlon. Acute exposure symptoms include, but are not limited to, difficulty breathing, lethargy, incoordination, weakness, and tremors, as well as skin sensitization, increasing subsequent exposure symptoms. In lab animals an increased incidence of breast cancer, kidney damage, various reproductive problems, and genetic damage, was observed. Triclopyr's breakdown product 3,5,6-trichloro-2-pyridinol (TCP) disrupts nervous system development, and in lab tests, it accumated in fetal brains when exposed during pregnancy.

Triclopyr also causes complex ecological impacts, including, but not limited to, interfering with nitrogen cycling, and inhibiting the growth of beneficial mycorrhizal fungi that aid nutrient uptake in plants. It has been observed to reduce the diversity of mosses and lichens. The breakdown product TCP is toxic to soil bacteria. Triclopyr is mobile and persistent in soil, has contaminated wells, streams, and rivers, and has the potential to contaminate ground water. Increased growth of algae has been observed after triclopyr applications. It is highly toxic to fish, affects oyster larvae, and disturbs frog behaviors that help them avoid predators. It also decreases the survival of bird nestlings, is toxic to spider mites, and affects other beneficial insects and spiders by killing plants they depend on for food and shelter.

Glyphosate
https://web.archive.org/web/20090423133524/http://www.alternatives2toxics.org/catsoldsite/round.htm and
https://d3n8a8pro7vhmx.cloudfront.net/ncap/pages/26/attachments/original/1428423381/glyphosate.pdf

Under pressure from students who were concerned about pesticides, glyphosate was suspended from UC campuses, but only temporarily, and with exceptions, including for projects such as these. This ban should be made permanent across the entire campus, without exceptions, along with ending pesticide use altogether.

Glyphosate is the active chemical ingredient in products like Roundup. Roundup also contains the surfactant polyethoxylated tallowamine (POEA), which is even more toxic than glyphosate, and the combination of the two is more toxic than either chemical on its own. Acute exposure symptoms include, but are not limited to, eye and skin irritation, blurred vision, skin rashes and blisters, headache, nausea, dizziness, numbness, elevated blood pressure, heart palpitations, coughing, congestion, and chest pains. Extended exposures have been associated with non-Hodgkin's lymphoma, miscarriages, premature birth, and other reproductive harm. In lab animals there was an increase in testicular, kidney, pancreas and liver tumors, as well as thyroid cancer. Studies have shown glyphosate to be mutagenic, and to cause chromosome and DNA damage.

Since the above linked toxicological profiles were published, many other hazards of glyphosate have been identified, and a couple of years ago the World Health Organizations International Agency for Research on Cancer finally classified glyphosate as a probable human carcinogen (http://monographs.iarc.fr/ENG/Monographs/vol112/mono112-09.pdf). Numerous lawsuits in favor of victims of cancer due to glyphosate poisoning have been won since, and many more are in the courts now.

Glyphosate also causes complex ecological impacts, including, but not limited to, inhibiting the growth of nitrogen-fixing bacteria and mycorrhizal fungi, reducing seed quality, and making plants more susceptible to disease. Glyphosate drifts extensively, and is mobile and persistent in soil. Its persistence in soil varies widely, from days to months, but has been found to persist on some forest sites for as long as 3 years. It has been found in both ground and surface water, has found its way into streams and rivers, and contaminated wells. Both glyphosate and POEA are toxic to fish. Roundup has been shown to kill various beneficial insects, such as species of parasitic wasps, lacewings, ladybugs, predatory mites and beetles. Glyphosate also reduces the growth of earthworms, and affects other beneficial insects, spiders, birds, and wildlife by killing plants they depend on for food and shelter.

Imazapyr
https://d3n8a8pro7vhmx.cloudfront.net/ncap/pages/26/attachments/original/1428423389/imazapyr.pdf

Imazapyr is the active ingredient in products like Stalker. Acute exposure symptoms include, but are not limited to, eye and skin irritation. It is corrosive and can cause irreversible eye damage. Acute effects on lab animals included bleeding and congested lungs, congestion of kidneys, liver, and the intestine. Chronic exposure in lab animals caused fluid accumulation in the lungs, kidney cysts, abnormal blood formation in the spleen, increase in brain, adrenal gland, and thyroid cancers. Quinolinic acid, a breakdown product of imazapyr, causes eye, skin, and respiratory irritation, and is a neurotoxin which causes nerve lesions and symptoms similar to Huntington's disease.

Imazapyr is very mobile and persistent in soil. It has been shown to persist in soil for well over a year. It can disrupt nutrient cycling by slowing down the decomposition of plant material. Imazapyr has contaminated both surface and ground water. Ozone degradation, to remove pesticides from drinking water, removes only half of the contamination. Imazapyr is highly toxic to fish.

Surflan
https://web.archive.org/web/20080827224318/http://www.alternatives2toxics.org/catsoldsite/surf.htm

The active ingredient of Surflan is oryzalin. It is rated a possible human carcinogen. A contaminant during manufacture, N nitrosodipropylamine (NDPA) is a confirmed human carcinogen, and there are also concerns about another contaminant, ammonium 3,5 dinitro 4 di(n propyl)amino benzene sulfonate. In exploited lab rats oryzalin caused thyroid, skin, breast, and other tumors. It targets the liver, blood, blood forming tissue, and is toxic to bone marrow. In animals tests there were adverse changes in blood chemistry, cholesterol levels, anemia, liver, spleen and bone marrow, as well as chromosome mutations. Prolonged exposure can cause irritation and allergic reaction, and higher temperatures may generate irritating vapors when inhaled.

As airborne dust oryzalin has severe explosive potential. One-half remains intact in soil for 30-160 days. It is not very soluble in water, but may reach aquatic systems with silt and soil particles it adsorbs to. It is toxic to fish and aquatic invertebrates, and has a tendency to bioconcentrate in aquatic organisms.

Undisclosed ingredients and chemical mixtures

In addition to active ingredients and their breakdown products, herbicides contain a large percentage of so-called "inert" ingredients, which are kept undisclosed, protected as "proprietary" by trade secret laws, though chemical companies have the laboratory equipment to easily determine the ingredients in a competitor's product, while it's the public that is being kept in the dark. Anything but benign, as one might expect "inert" to imply, these secret ingredients are frequently even more toxic than the so-called "active" ingredients listed on the label. In fact, the combination of chemicals is specifically designed to interact synergistically to achieve greater toxicity than each chemical on its own (http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1764160/pdf/ehp0114-001803.pdf).

Some inert ingredients, such as the surfactant POEA in Roundup, have been identified. POEA causes eye burns, skin redness and swelling, blistering, nausea, and diarrhea. Another ingredient in some Roundup products is isopropylamine, which causes injury to the tissue of mucous membranes and upper respiratory tract, wheezing, laryngitis, headache, and nausea. The details about most other inert ingredients and their effect is being withheld from the public, including from medical workers. Some herbicides to be used in the Plan are likely to also to be mixed with undisclosed chemical dyes.

Contamination during manufacture further adds to the danger of chemical use. POEA is contaminated during manufacturing by 1,4 dioxane, which is recognized as a carcinogen under Proposition 65. As mentioned previously, oryzalin is contaminated by NDPA, which is also a confirmed human carcinogen.

Synergistic effects also come into play when herbicide products are being combined, as UC does, and proposes in this Plan, mixing imazapyr with either triclopyr or glyphosate. Mixing can also occur when different herbicides are used near each other, and chemicals combine as they drift by air, water, soil, and physical contact. Because chemical residues can persist in the environment for a long time, and herbicide products break down into various chemical components, subsequent applications of different herbicides can also combine into yet new, unintended mixtures. Synergism can exponentially increase chemical toxicity (https://web.archive.org/web/20171225122004/http://www.ourstolenfuture.org/newscience/synergy/mixtures.htm).

Dose response

Manufacturers and other proponents of pesticides often downplay environmental health hazards, by claiming that they are using negligible quantities of the chemicals. While this is debatable on many levels, it is also irrelevant. Some effects, specifically endocrine disruption, a common malady in the age of plastic, are subject to a nonmonotonic dose response, where decreasing exposure levels can actually cause greater impacts (https://web.archive.org/web/20171006092345/http://www.ourstolenfuture.org/newscience/lowdose/nonmonotonic.htm). Disruptions of the endocrine systems are far reaching, and can cause a vast number of reproductive problems, various cancers, and can impair immune and neurological functions.

In addition to all the other negative environmental health effects, glyphosate has also been shown to be an endocrine disruptor (see http://www.ncbi.nlm.nih.gov/pubmed/19539684 and http://www.greenmedinfo.com/blog/breaking-glyphosate-roundup-carcinogenic-parts-trillion-range). Endocrine effects of the other pesticides in this program have not been adequately studied, and with a large percentage of the ingredients undisclosed, so are their effects.

Body burden studies show that chemicals accumulate and persist in our bodies over time (https://web.archive.org/web/20161221071716/http://www.ewg.org/sites/bodyburden1//), including chemicals to which we were exposed by drift or extensive cross-contamination. Most alarming are findings that chemical injuries are being passed on over generations (https://web.archive.org/web/20090109144254/http://www.organicconsumers.org/Politics/toxins060605.cfm).

Chemical exposures have harmed countless people, causing fatal or disabling illnesses, including, but not limited to, lung diseases, cancers, neurological disorders, reproductive harm, immune deficiencies, and increased sensitization to chemicals. They can cause multi-organ effects and can impact every system of the body. For millions of people already disabled by exposure to toxic chemicals, herbicide applications present especially severe health risks and direct barriers to access. They deny access to natural areas to those of us who have been injured, who struggle to breathe in the inner cities, and who are most in need of refuge from urban pollution. Obstacles to access to public spaces for people with disabilities are a violation of the Americans with Disabilities Act (ADA).

The authors of the Initial Study claim that public services, schools, parks, and public facilities would not be be impacted, but pesticides are are an access barrier for people with disabilities, and therefore there would be an impact. In fact, the Scoping Meeting the university held for the EIR was not accessible. Not only is public transportation to the UC Botanical Garden very limited, and requires a substantial uphill hike, along roads that wheelchair users can't easily maneuver, especially after dark, but there is also a great deal of pesticide use at the garden, which excludes people who were injured and disabled by pesticides, and who are among the most urgently interested in this process.

Among the cooperating entities and experts consulted in the production of the Plan and EIR, where are the environmental health physicians, who have worked with victims of pesticide poisoning and other toxic injuries? Will the EIR include calculations of the potential medical expenses of members of the community who are injured by the increase of pesticide use in the area?

Risk Assessment vs Precaution

The approach of estimating "safe" exposure levels is typical of toxic industries and government agencies to defend their toxic actions. It's based on Risk Assessment methodology, which determines what is an "acceptable" or "negligible" risk, as public and environmental health is weighed against "economic" benefits for some, and life and health of others is sacrificed. This is the methodology used in environmental reviews, and automatically turns an EIR into an adversarial process

The "acceptable risk" this methodology refers to are real people like myself, who have been injured and disabled by pesticide exposures previously, and others who are particularly vulnerable to the effects of poisoning. It's not realistic to expect that injured people not take personal offense at this approach. Loss or reduction of profits of the agencies and companies involved is never deemed a "negligible" or "acceptable risk".

The polar opposite approach to Risk Assessment is the Precautionary Principle, which essentially makes decisions on the basis of "better safe than sorry", and puts the burden of proof that an action is truly safe on those who propose it, instead of on the potential or actual victims of the action. This is the approach that should be employed in this EIR.

Being a community means that we don't exclude and abandon the most vulnerable among us. Wrapping "science" in Risk Assessment terminology is used to divide and conquer, to turn us against each other, and to teach us that it's okay to risk the well-being of others for our own perceived comforts. It has nothing to do with science, and everything to do with the selfish aims of some.

Another claim in the Plan is that there is no conflict with any local policies, but the university pesticide use is in conflict with current Cities of Oakland and Berkeley pesticide policies. Berkeley does not use herbicides, and Oakland is prohibited from using them in the hills for this purpose.

DEFORESTATION AND XENOPHOBIA

While the stated intent of the Initial Study for the Plan is to reduce wildfire risk and manage "vegetative fuel" in the Hill Campus, it repeatedly mentions "exotic plant removal" and plans to "restore native vegetation". Since the Plan is not for a restoration project, but for fire safety, the implication is that the plants targeted for removal are somehow more of a fire hazard than plants that are not considered "exotic"

But perpetuating this myth and singling out so-called "non-native" or "exotic" plant species for eradication, is something the 1991 Oakland-Berkeley Mayors' Task Force on Emergency Preparedness & Community Restoration, which was tasked with investigating the causes of the 1991 Oakland fire, explicitly advised against in its conclusions (http://www.hillsconservationnetwork.org/Additional_Resources_files/sc001635e6.pdf).

As recalled by retired Oakland firefighter Dave Maloney, who was appointed to the 1991 Task Force, it was not trees, but human structures that were primarily to blame for the spread of that fire: http://www.contracostatimes.com/montclarion/ci_12946185

> "The Task Force Report concluded that the spread of the fire was mostly due to the radiant heat generated by burning houses. A burning house has a sustained radiant heat transmission of 2,500-3,000 degrees. The spread of the fire was not due primarily to burning trees — eucalyptus or any other species."

The vilification of eucalyptus, acacia, and Monterey pines as more fire prone than other trees, let alone the native grasslands that UC hopes will replace some of what is now forested, is based entirely on ideology, not on science or common sense, and is counter to the warnings by experts like Maloney and others, which are being willfully and dangerously ignored by UC and other proponents of nativism and "Invasion Biology".

Dense forests keep winds from spreading fires, and the moisture from many inches of annual fog drip keep fires from starting in the first place. Trees do not catch fire easily, unlike grasslands, where most wildfires start, as did the one in 1991. The fire risk are humans, not plants. Most fires are started by humans, and often it is houses that set trees ablaze, not the other way around.

It is worth noting that the native bay laurel is also considered a highly flammable plant, with higher combustible oil content in its leaves than the much vilified eucalyptus, but is not targeted in the Plan. While I by no means advocate that the Plan should target bay trees, or any trees at all, it further demonstrates the contradictions and prejudicial reasoning that drives this Plan.

Conservation biologist David Theodoropoulos has done extensive research and field work that has exposed the field of "Invasion Biology" as a pseudoscience (http://dtheo.org/InvasionBiology.htm). In 2015 he gave a thorough and eye-opening presentation during a discussion about the FEMA projects, along with Maloney and others, debunking both the "nativist" and "invasionist" belief system in general, as well as the tree removal projects in the East Bay hills specifically, to a large community hall packed to capacity. I urge all honest policy-makers to take the time to view this important event, which is posted online in its entirety here: https://www.youtube.com/watch?v=n1i3RP7eDFc

Neither science nor democracy are involved in this belief system, and it is certainly not something that a university should base its policies on. Xenophobia and ecocide do not represent environmentalism. But that is the ideology that much of the analysis in the UCB 2020 LRDP EIR, the attempted Hills Campus Addendum, and the FEMA EIS was based on, as is this Initial Study and Plan. It is not based on sound evolutionary science, as Stephen Jay Gould explained in his article "An Evolutionary Perspective on Strengths, Fallacies, and Confusions in the Concept of Native Plants" (linked from and summarized here: http://milliontrees.me/2010/12/01/stephen-jay-gould-examines-the-concept-of-native-plants/)

Proponents of the FEMA projects, lead by now former UCB Environmental Projects Manager Tom Klatt, who is now retired, but had been advising various local agencies to use herbicides for years, and who has been the driving force behind these projects in the East Bay Hills, came together at a 2013 forum. One of the most vocal supporters of these projects, Jon Kaufman, a member of the Board of Directors of the Claremont Canyon Conservancy, demonstrated the common lack of logic of this framework quite well: http://www.youtube.com/watch?v=w4Wmlze2xms

> "Another concern was, aren't you going to be altering the ecosystem? Aren't there plants and wildlife and things on this hillside now that you're going to destroy when you remove the eucalyptus trees. Well guess what, that ecosystem was destroyed when those eucalyptus trees were planted a hundred years ago....What they're going to do in fact is restore it and make this area what it was intended to be in the first place." (58:21)

Aside from the misleading claim that these projects were about restoration, for which there were never any provisions in the EIS he was promoting, one is left to wonder just precisely who "intended" this area to be the way he believes it should be: Mr. Kaufman? God? The government? UC Berkeley?

Mr. Kaufman's notion that ecocide somehow fixes previous ecocide is more than a little troubling. By this logic, people of European descent should be killed as to magically reverse the genocide of the native people who were here before the European invasion. It is particularly perverse that this hostility toward non-native species is largely promoted by people of European descent, who all too frequently refer to themselves as natives of the Bay Area.

In contrast, the native community has a very different attitude towards so-called non-native plant life, as expressed by the defenders of Sogorea Te, the native burial ground in Vallejo, when it was also being threatened:
http://web.archive.org/web/20150912091317/http://protectglencove.org/about/

> "The Master Plan also calls for an aggressive extermination of non-native plant species. Procedures detailed in the Plan describe cutting down trees and applying herbicide to their exposed trunks and remaining root systems. The Plan also calls for years of ongoing herbicide application. Elders in the local Native community say that *All Life is Sacred*. We oppose extermination of the trees and plants that have taken root on this Sacred Burial Ground, regardless of whether they are endemic species or relative newcomers."

Endangered Species

Ironically, the tree destruction that is fueled by nativism is actually a threat to already endangered native species in the East Bay hills. Herbicides threaten the California Red-Legged Frog, and the Presidio Clarkia, whose habitats are not adequately protected against the drift these chemicals the university uses are known for, regardless of application method. Both the Alameda Whipsnake and Alameda Pallid Manzanita are fire-dependent and threatened by the exclusion of fire from their habitat. The Pallid Manzanita specifically cannot reproduce without fire to sterilize the soil and scar its seeds.

It's important to understand that wildfires are a necessary part of the ecology in wildfire zones, where species evolved to be fire-dependent. The fact is that these native species are threatened with extinction because of human development, chemical vegetation management practices, and aggressive wildfire prevention, the very actions this Plan promotes. The entire xenophobic framework of native vs. non-native species is full of such contradictions.

While eucalyptus trees originated as far away as Australia, Monterey pines, which are also targeted by this Plan, originated merely 80 miles from here, and are listed as endangered, and should be treasured and preserved as such wherever they are found.

Eucalyptus, the most vilified of the targeted trees, are no hazard to native species, but actually contribute to keeping endangered species alive. They are a particularly important supply of nectar for bees and other imperiled pollinators, because they bloom year-round (https://sutroforest.com/eucalyptus-myths/). They are a preferred overwintering site for monarch butterflies (https://milliontrees.me/2013/11/01/monarch-butterflies-in-california-need-eucalyptus-trees-for-their-winter-roost/), which are becoming endangered primarily due to few nectar sources in the fall, and habitat fragmentation, including by logging along their migration route (http://news.cornell.edu/stories/2016/04/beyond-milkweed-monarchs-face-habitat-nectar-threats).

While the authors of the Initial Study admit that the Plan is likely to have significant impact on special-status species, they insist that it will not have any noteworthy effects on forest resources, and will not result in loss of forest land.

Getting all twisted up in semantics and convoluted policy definitions, they rationalize removing the majority of trees that are considered "exotic" by conveniently defining forests as "land that can support 10 percent native tree cover". The authors seem to imply that the forested areas that are there now are not "natural", because most of the trees at some time originated from elsewhere, and therefore are not really a forest, and therefore clearcutting all those "exotic" trees will turn the tiny number of native trees into a forest all on their own.

But nativist contradictions are once again evident, because earlier in the Initial Study authors admit that the Plan would alter the structure of the forest.

DEVELOPMENT

The authors of the Initial Study insist that the Plan would have no substantial effect on land use and planning, but the East Bay Hills projects have always been at their core about development, and UCB's plans even say so in the title of the primary "Long Range Development" plan. The university has in the past indicated that it intends to build student and faculty housing in the Plan area, and there have long been plans to expand campus facilities, as well as the LBNL which is adjacent to the area.

While I understand and sympathize with the desire to live in a natural environment, and I certainly don't want anyone to get hurt in a fire, I strongly oppose any further destruction of precious forests so that people can feel more comfortable building (and perpetually rebuilding) their flammable wooden houses in a natural wildfire zone. If people are afraid of trees they shouldn't choose to live in a forest.

In requesting FEMA funding to mitigate fire danger of the already existing structures in the hills, a more reasonable focus would have been on replacing roofs with fire resistant materials. But in addition to safer roofs, it is absurd that timber construction of exquisitely flammable tinderboxes continues to be permitted in natural wildfire zones. Any fire mitigation project should first focus on what provided the primary fuel for the 1991 fire: the human-built structures.

A few years ago, when Oakland firefighters saved the building I live in, they told us that the entire six unit residential structure would have been gone within another 2-3 minutes.

Compare that with the couple of hours it can take to burn through a strawbale wall, or the clay-firing effect of fire on an earthen wall. Even thick layers of earthen plaster would increase the fire resistance of existing timber structure, and should be undertaken by all residents in the hills. In traditional societies plastering homes at regular intervals is an activity that brings communities together, and for a university could be a tremendous teaching opportunity.

For some of the fire tests performed on strawbale structures, please see:

* https://web.archive.org/web/20141231212625/http://www.one-world-design.com/straw_bale_fire_safety.asp

* https://web.archive.org/web/20120616182644/http://earthgarden.com.au/strawbale/fire_test.html

* http://www.potkettleblack.com/natbild/fire.html

Cob or rammed earth, natural building methods similar to adobe, but seamless and monolithic, instead of bricks mortared together, essentially turn to ceramic in fires. In fact, Nader Khalili, founder of the California Institute of Earth Art and Architecture (Cal-Earth) in Hesperia, experimented with the Geltaftan building method, where he turned earthen structures into their own kiln, burning them from the inside to create ceramic houses (https://web.archive.org/web/20120328115956/http://archnet.org/library/sites/one-site.jsp?site_id=260).

A relevant example of what happens to earthen structures in a fire is this image of Harbin Hot Springs, a retreat center in Lake County that was consumed by the 2015 Valley Fire, in which you can see that the portions of the temple walls that were built with earth remain standing, while every bit of wood in the structure was destroyed: https://www.facebook.com/PosterityProductions/photos/a.891054524322216.1073741881.137782922982717/891055130988822/ (an image of the intact temple before the fire can be seen here: https://inhabitat.com/sunray-kelleys-harbin-hot-springs-temple-in-napa-valley-is-made-from-natural-materials/))

Both strawbale and cob structures have also done very well in seismic tests, and thus are suitable for building in the Bay Area:

Strawbale shake tests:
https://web.archive.org/web/20110416205659/http://naturalhomes.org/earthquakestraw.htm

Cob shake tests:

* http://www.builtinbliss.com/wp-content/uploads/2013/01/01a.-The-Stanley-Park-Earthen-Architecture-Project-Shake-Te.pdf

* http://www.builtinbliss.com/wp-content/uploads/2013/01/01b.-The-Stanley-Park-Earthen-Architecture-Project-Shake-Te.pdf

A better use of the funds being spent on this EIR, and eventually the destructive implementation of the Plan, would be to relocate residents who don't feel comfortable living in the woods to a place where they feel safer, fund earthen building practices in the hills for those who want to stay, and for the responsible agencies to ensure that streets and water hydrants are accessible when fire suppression is necessary for saving lives and homes, and that the fire departments are properly funded.

Some dire mistakes were made by the Oakland fire department in 1991, specifically walking away before the danger of reignition was over, which is what caused that fire to get out of control. The fire department has since learned to remain alert longer, though it's a lesson that should be reinforced every fire season.

We have not had a major fire in the hills since 1991, primarily because of improvements in the fire department, as well as in building practices. Many of the human-built structures in the hills have since been built with less flammable materials, particularly roofs are no longer built with wooden shingles.

INCREASED FIRE DANGER

The Plan's stated intent is to reduce wildfire risk, but the proposed actions are more likely to dramatically increase fire danger. In addition to clearcutting moisture-rich forests and turning them into dry, flammable grasslands, as well as removing windbreaks, giving Diablo winds free rein to drive fires into our communities, large piles of chipped, dead vegetation are to be spread over large areas, and herbicides planned for use increase the flammability of vegetation, and may themselves be flammable.

The manufacturer's Material Safety Data Sheets (MSDS) for Garlon, a triclopyr product the university has used, for example, indicate that these chemicals are fire hazards, and produce toxic fumes when they do burn. They are mixed with carrier oils that may contribute further to their flammability and toxicity.

The warning that toxic vapors will be released if involved in a fire is very common for pesticide products, and is also true for other herbicides to be used in this project (and already used extensively in other UC projects). It shows that chemical use in fire prone areas is particularly irresponsible. (Pesticide labels and MSDS can be found here: http://www.cdms.net/LabelsSDS/home/)

Experiments by community activists also show that herbicides in general make vegetation more flammable than vegetation that was not exposed to herbicides (http://www.dontspraycalifornia.org/Cheriel Response.html).

The Plan also claims that it would not cause any new source of substantial light or glare that would affect day or nighttime views in the area, but when you cut down a lot of trees you necessarily create a new source of substantially brighter light in formerly shaded area, which do adversely affect daytime views of the area. Removing trees also lets the glare from city lights be seen more widely in the area at night. More importantly, the sunlight that would now saturate the denuded area would increase fire danger by removing the source of shade and moisture that inhibits fires.

Respecting those who keep us safe

Firefighters have long complained about the exploitation of their labor, and the expectation that they risk their lives to protect property that was knowingly placed in the path of inevitable destruction, so for example said one:
https://web.archive.org/web/20131002190712/http://firechief.com/wf-public-education/dj-vu-all-over-again

> "I strongly support the concept of individual freedom except when it costs me, and other taxpayers, unreasonable amounts of our tax dollars to indulge the foolishness of those who chose to build and live in those areas like Hurricane Alley and the interface. More importantly, I can't support that choice when those folks expect me and my fellow firefighters to place ourselves in unnecessary risk to save the property that they did not take the basic precautions to protect from wildfire. "

In fact, national wildfire policy in general has come under attack in recent years, and in a lawsuit by the Forest Service Employees for Environmental Ethics (FSEEE), the father of a firefighter killed on the job said:
http://community.seattletimes.nwsource.com/archive/?date=20031015&slug=wildfires15

> "'The problem is we've got these kids out there dying for something that is scientifically bankrupt. We are subverting nature, causing more damage than good, and we are taking kids' lives. That is just so wrong.'

> The lawsuit argues that wildfire is a natural phenomenon in forests throughout North America, but the Forest Service policy of trying to put out nearly all wildfires has created conditions that have produced huge wildfires in recent years."

All the East Bay Hills projects, including this Plan, follow a similar trajectory, as they attempt to impose unreasonable controls on these natural phenoma, and in the process do more harm than good, increasing fire danger instead of reducing it, and destroying ecosystems instead of protecting lives.

In 2016, in response to the proposed FEMA projects, Dave Maloney published another report analyzing these types of projects. It is a devastating prediction of the reach of the next fire, if these projects keep being implemented in the East Bay hills. His report is the most urgently important document for UC policy-makers to read in consideration of this EIR: https://defendeastbayforests.files.wordpress.com/2016/07/nextfiremaloney.pdf

CONCLUSION

The Initial Study promotes a one-sided, unchallenged ideology that is not scientifically sound, and lacks alternative perspectives from experts in relevant fields, like conservation biologist David Theodoropoulos on "invasiveness", permaculturist Tao Orion on alternatives to toxic vegetation management, and retired firefighter David Maloney on fire safety.

When the university joined with the City of Oakland and the EBRPD in targeting the East Bay Hills for clearcutting, the three agencies had to submit to a combined EIS, because their projects were adjacent to each other, and together expanded the scope of the impact they would have cumulatively. The same remains true now, with the projects discussed in this Plan. They cannot be considered in isolation of other, similar projects in the East Bay hills. Oakland is currently working on an EIR for such a project, the park district continues destroying trees and applying pesticides, as is PG&E. And the university is already conducting similar activities in the Plan area and surroundings, which authors of the Initial Study insist are not to be discussed in this EIR.

Vegetation management is not a primary issue in fire safety. The real wildfire danger to human life needs to be addressed elsewhere than in our last forested areas, but in human homes that encroach upon them. I vote for the No Project option, and for diverting vegetation management funding earmarked for tree removal and pesticides to where it's most needed, for structurally securing homes and facilities, and for firefighting.

The Plan claims that the goal is to protect life. Chopping down forests and poisoning the environment accomplish the opposite. Instead of endorsing and enabling these actions, the

EIR should reflect the real dangers this project poses to public and environmental health, and put on the environmental record the actions that the university has already undertaken, including illegally clearcutting on Frowning Ridge before the FEMA EIS which was reviewing the impacts of removing trees from that site was completed, so that the officials responsible can be held accountable for the environmental devastation they are perpetrating on our ecosystem.

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Letter I28

Planning Departmental <planning@berkeley.edu>

Berkeley Hills Campus Wildland Vegetative Fuel Management Environmental Impact Report - public comment.

1 message

Anastasia Glikshtern [redacted] Mon, Oct 5, 2020 at 1:34 PM
To: planning@berkeley.edu

Dear Sir/Madam,

I.

The "targeted ground application of herbicides" proposed by the EIR is unacceptable.
As a science organization you should know that they must not be used anywhere on Earth:

- They are more toxic, more persistent, more mobile and more dangerous than their manufacturers disclose;
- Numerous scientific studies associate exposure to herbicides with cancer, developmental and learning disabilities, nerve and immune system damage, liver or kidney damage, reproductive impairment, birth defects, and disruption of the endocrine system;
- There is no safe dose of exposure to those chemicals because they persist in soil, water, and animal tissue, so even low levels of exposure could still accumulate and harm humans, animals, and the environment; I28-1
- Especially vulnerable individuals include infants, children, pregnant women, the elderly, people with compromised immune systems and chemical sensitivities;
- Toxic runoff from herbicides pollute streams and groundwater, and therefore the drinking water sources;
- Herbicides are harmful to pets and wildlife – including threatened and endangered species, plants, and natural ecosystems;
- Herbicides are harmful to soil microbiology and contaminate soil into the future, reducing biodiversity in sensitive areas.

People have a right not to be involuntarily exposed to herbicides in the air, water or soil that inevitably result from chemical drift and contaminated runoff.

II.

As all recent catastrophic fires clearly demonstrated so-called "native" species are as flammable as so-called "exotic invasive species".
So-called "restoration" is actually the destruction of existing habitat.
Even though the so-called "native" trees are selected by staff – it doesn't mean they wouldn't burn. They are as much – or more - fire hazard as the big, mature, healthy "exotic" trees being mindlessly killed. And, of course "native" grasslands and shrubs burn best.

This plan for fire prevention is more likely to cause fire than prevent it. I28-2
Every tree killed increases the heat and dryness, and eliminates moisture that prevents fire. With elimina on of trees there is more wind - another major fire problem.
We need every tree we can get, par cularly the species that are most drought resistant, including Eucalyptus, Acacia, and Douglas Fir. The fog drip from these long-lived trees keeps some of the understory green year round.
Keep the trees. Ban herbicides.
Sincerely,
Anastasia Glikshtern

Letter I29

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Planning Departmental <planning@berkeley.edu>

Comments re theUCB Draft EIR

1 message

Stephanie Thomas [redacted] Mon, Oct 5, 2020 at 4:59 PM
To: planning@berkeley.edu

UC Berkeley -Physical & Environmental Planning
Attention Raphael Breines, Senior Planner,

Dear Mr Breines.

I am writing to oppose any aggressive Plans for cutting down trees on the UC property (which is public land) and of continued use of pesticides in these lands. I29-1

I oppose the No project Alternative as it would keep the current UC practices which is cutting trees and using pesticides. I29-2

I also oppose Alternative A which labels many of the tree, which have been there for years, Invasive. Returning these lands to a past period in history is not practical and is dangerous. You need only to see all the fires spreading many of which are grass fires. Our hills w/ the tall trees w/ there fog drip are still standing. despite the unconscionable firworks activity on the outlooks. I29-3

We need to keep the forest w/ the current habitat for our fire safety and for the protection of the plants and animals that live there. I29-4

Some of UC's plans are to build structures on parts of its lands. This would be adding to the fire danger because humans would be encroaching w/ cars, and other equipment. Minimal breaking up of the lands is the safe plan I29-5

Alternative B sounds good as it reduces the pesticides, but too many younger trees are targeted. This plan has some good aspects. I29-6

Thanks,
Stephanie Thomas
[redacted]
berkeley CA.

Letter Z

Response to UC Fire Management Plan
Joe R. McBride
August 4, 2020

I am very impressed with science and understanding of fuel management that went into the plan. The modelling was very informative and the details of various fuel management methods were well developed. I was also impressed with the plans for treating the wood waste that would be generated by the various fuel management methods. Carol Rice and Wildland Resource Management should be complemented for an outstanding job. Z-1

I do have a few questions that arose as I read the plan:

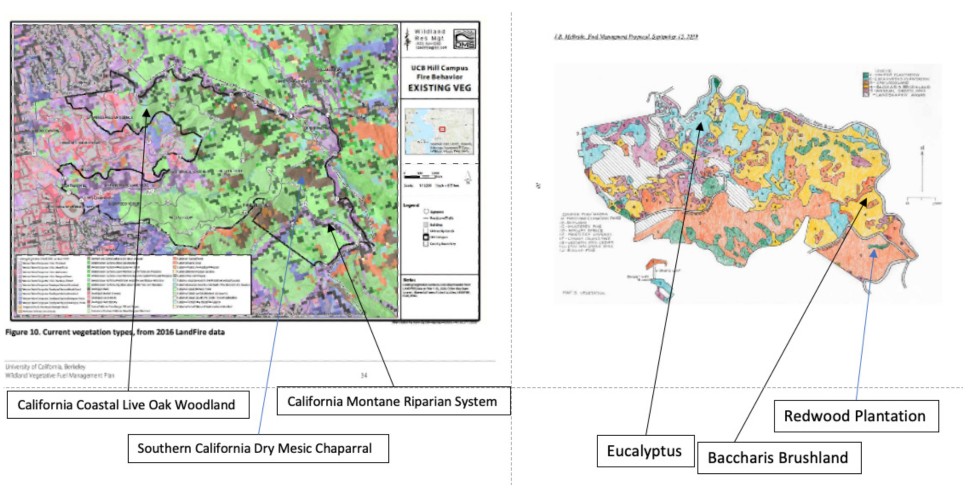
1. p. 18 – "Maintain at least 8 feet of vertical clearance between roof surface and overhanging portions of trees."

This is in contradiction to CalFire instructions for creating defensible space: "Remove branches that hang over your roof…" (https://www.readyforwildfire.org/prepare-for-wildfire/get-ready/defensible-space/) Z-2

2. p. 19 – "Grassland vegetation and invasive weeds will be mowed to a 4-inch height or treated with herbicide annually."

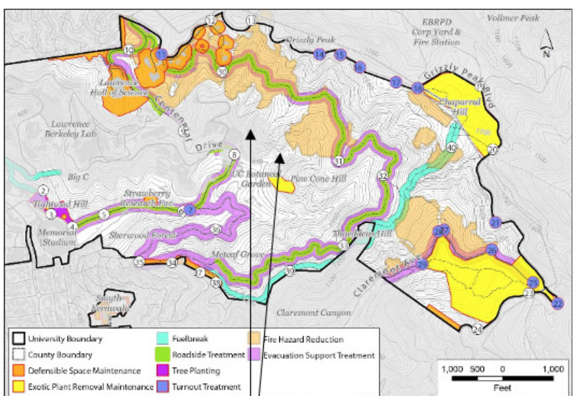
Treating grass and weed with herbicides kills the plants and leaves in place dead fuel that dries out quickly. If herbicides are used the dead fuel should be removed. Mowing before annual grassed have set seed can usually result in some decay of the cut grass, but mowing once grasses have cured will only create a surface fuel problem. Grass cutting or grass and weeds that have been killed by herbicides should be removed to reduce fuel loading. Z-3

3. p.34 - The vegetation Map (Figure 10. Current vegetation types, from 2016 LandFire data)incorrectly identifies several vegetation types. For example, see maps below: Z-4



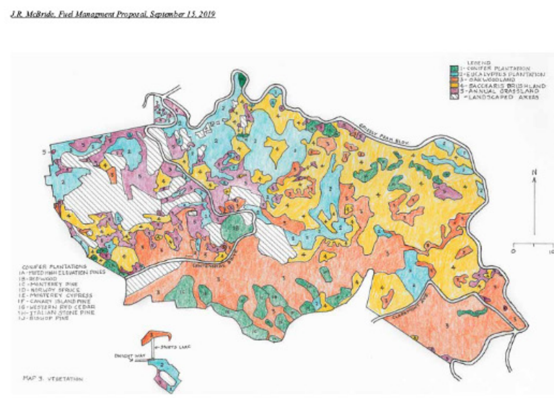
This misidentification affects the results of the fire models. Eucalyptus plantations have much larger fuel loading, exfoliating bark, and aromatic compounds in the leaves which contribute a much greater fire danger, greater fire line intensity, greater propensity to torching and crown fires, and greater production of embers that can cause more spot fires than California Coastal Live Oak Woodlands. Baccharis brushland, on the other hand, presents much less fire hazard than Southern California Dry Mesic Chaparral. Z-4 cont.

4. p. 58 – Figure 23. Proposed areas of treatment shows 3 areas for exotic plant removal maintenance. These are areas where eucalyptus had previously been removed and came back via sprouting and seedling establishment. The map also shows several units designated as Fire Hazard Reduction. Both of these treatment areas support eucalyptus, but there are other areas of eucalyptus that are not designated for any treatment. I believe all areas of eucalyptus should be removed. Z-5

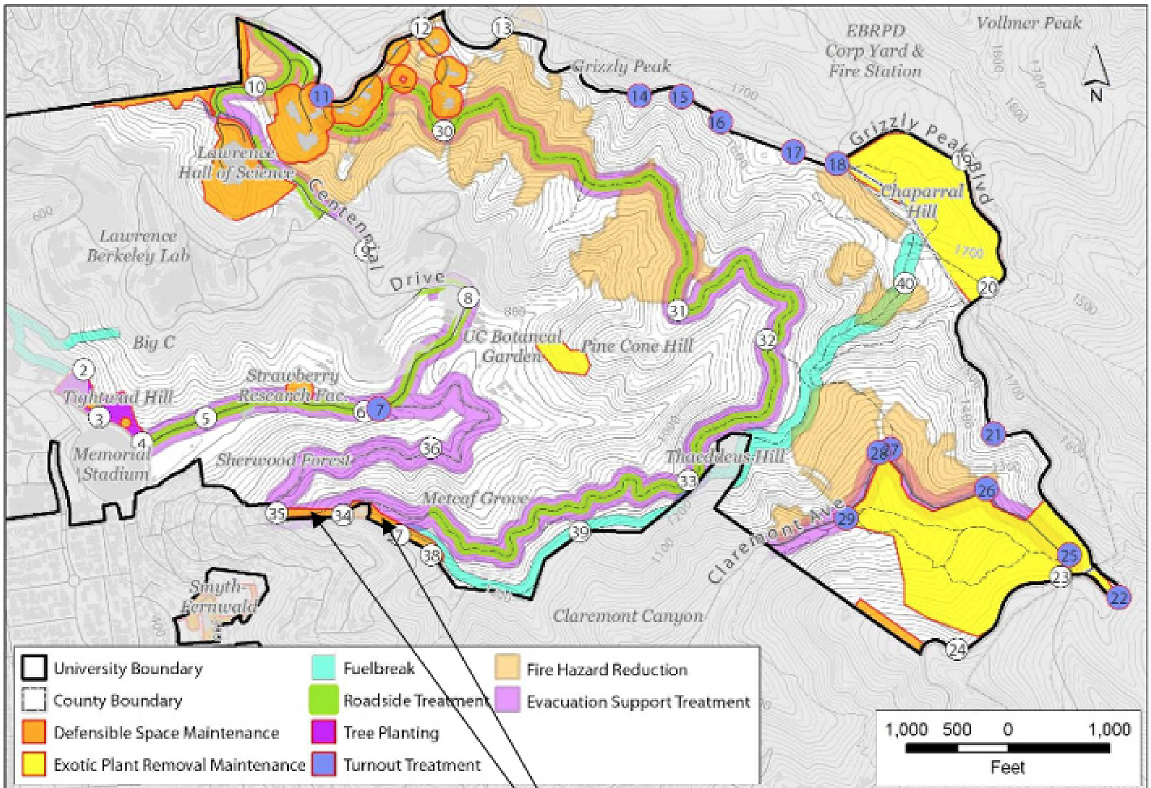


All Projects Considered
Figure 23. Proposed areas of treatment
UC Berkeley Hill Campus Wildland Fuel Management Plan
University of California, Berkeley
Wildland Vegetative Fuel Management Plan
58

Areas of eucalyptus outside of the proposed areas of treatment



5. p. 66 – Treatment indicates that Monterey pine will be removed from fuel breaks. The Proposed areas of treatment (Figure 23 – above) indicated that the fuel break coming down from Grizzly Peak Boulevard ends near the top of the Panoramic neighborhood and that the boundary between the Panoramic neighborhood and University property will be treated as defensible space maintenance zone. I do not think defensible space treatment will provide the adjacent property owners with the protection from fires moving up the north facing slope of Strawberry Canyon. I believe a continuation of the fuel break would be a better treatment of this area. Removal of the conifers from this ridge would also minimize the production of embers that could result in spot fires in the Panoramic neighborhood during a fire being driven by northeasterly (Diablo) winds. See below: Z-6



All Projects Considered

UC Berkeley Hill Campus Wildland Fuel Management Plan

Figure 23. Proposed areas of treatment

University of California, Berkeley
Wildland Vegetative Fuel Management Plan 58

Replace Defensible Space maintenance with Fuel break

Z-6 cont.

6. p.86 – I do not believe the 80/20 rule should be applied to Eucalyptus. Where eucalyptus was previously cut and re-emerged from stump sprouts and seedlings it took over sites. The last line of section 8.4.1 (Exotic species management) states:

"To prevent the successful resprouting of treated exotic trees, all observed resprouts must be removed/treated within one year of the initial treatment (generally the cut-stump method) of exotic trees."

Z-7

I think this needs to be amended by stating that all observed resprouts that occur beyond one year of the initial treatment must be removed. Monitoring of the areas where eucalyptus has been removed (as described in section 8.2.5) will be very important in the removal of the eucalyptus.

Thank you very much for considering these proposed changes to the UC Fire management Plan.

Joe R. McBride

Appendix B1

Mitigation Monitoring and Reporting Program: Overall WVFMP

MITIGATION MONITORING AND REPORTING PROGRAM: OVERALL WVFMP

INTRODUCTION

The California Environmental Quality Act (CEQA) (Public Resources Code [PRC] Section 21081.6) and the State CEQA Guidelines (State CEQA Guidelines Sections 15091[d] and 15097) require public agencies to adopt a program for reporting on or monitoring the changes which it has either required in the project or made a condition of approval to avoid or substantially lessen significant environmental effects. A Mitigation Monitoring and Reporting Program (MMRP) is required for approval of the proposed Wildland Vegetative Fuel Management Plan (WVFMP or Plan) for the University of California, Berkeley (UC Berkeley) Hill Campus (Plan Area or Hill Campus), because the environmental impact report (EIR) identifies potential significant adverse impacts and all feasible mitigation measures have been adopted. Environmental protection measures (EPMs), which are part of the Plan, have been integrated into treatment design to avoid or minimize adverse effects. Where potentially significant impacts remain after application of EPMs, mitigation measures have been identified to further reduce and/or compensate for those impacts. While only mitigation measures are required to be included in an MMRP, both EPMs and mitigation measures are included in the WVFMP MMRP to assist in implementation of all measures for later activities consistent with the WVFMP.

MMRP FOR THE OVERALL WVFMP AND USE WITH LATER TREATMENT PROJECTS

This program-level MMRP for the WVFMP EIR will be adopted by the University of California Regents (UC Regents) when it approves the WVFMP. This MMRP provides a comprehensive list of all EPMs and mitigation measures identified in the EIR, which have been integrated into the Plan or made a condition of project approval to avoid or mitigate significant effects on the environment resulting from implementation of the WVFMP. The EIR includes both a program-level analysis for the overall WVFMP and a project-level analysis for the Identified Treatment Projects. The discussion below focuses on the program level analysis and the reference to a Program EIR is intended to address those components of the overall WVFMP not covered at a project level.

For each later vegetation treatment project implemented under the WVFMP, a project-specific MMRP will be completed along with an Environmental Checklist (see Appendix B of the EIR). The initial step in CEQA compliance for later vegetation treatment projects under the WVFMP (which are “later activities” pursuant to Section 15168 of the State CEQA Guidelines) is completion of the Environmental Checklist by the UC Regents. The Environmental Checklist will document the determination of whether the proposed later vegetation treatment project is within the scope of the Program EIR. Under this CEQA compliance approach, the UC Regents must incorporate from the Program EIR into the later vegetation treatment project all EPMs relevant to the proposed activity and all feasible mitigation measures in response to significant impacts caused by the later vegetation treatment project. Some EPMs and mitigation measures would apply to all projects, while others would only apply to projects that include specific treatment types or treatment activities, would affect certain resources, or result in certain potentially significant impacts. The project-specific MMRP will identify all EPMs and mitigation measures that are applicable to the later vegetation treatment project evaluated in the Environmental Checklist, the timing for the implementation of each (e.g., prior to or during initial treatment and/or maintenance activities), and the entity(ies) responsible for implementation of the EPMs and mitigation measures. The UC Regents, in coordination with UC Berkeley, will be responsible for implementation of the EPMs and mitigation measures pursuant to Section 15097 of the State CEQA Guidelines. For the purposes of the Program EIR, EPMs are intended to be implemented and enforced in the same way as mitigation measures consistent with Section 15126.4 of the State CEQA Guidelines.

If a later vegetation treatment project is not within the scope of the Program EIR and additional CEQA documentation is needed, such analysis may be provided through a Negative Declaration (ND), Mitigated Negative

Declaration (MND), or an EIR, depending on the environmental impact differences encountered. If additional CEQA documentation is needed for a later vegetation treatment project, a project-specific MMRP will be prepared by the UC Regents as part of the additional CEQA documentation if EPMs and/or mitigation measures are required to avoid or mitigate significant effects on the environment resulting from the later vegetation treatment project.

Accordingly, the project-level analysis of the Identified Treatment Projects is presented in the EIR and a separate MMRP has been prepared that is specific to the Identified Treatment Projects (refer to Appendix B2). The MMRP for the Identified Treatment Projects includes only those EPMs and mitigation measures that apply specifically to the Identified Treatment Projects.

PURPOSE OF MITIGATION MONITORING AND REPORTING PROGRAM

This MMRP has been prepared to monitor the implementation of EPMs and mitigation measures in connection with the approval of the WVFMP and its use by the university. The attached table presents the text of each EPM and mitigation measure, the timing of its planned implementation, the implementing entity, and the entity with monitoring responsibility. The numbering of EPMs and mitigation measures follows the numbering used in the EIR. EPMs and mitigation measures that are referenced more than once in the EIR are not duplicated in the MMRP.

ROLES AND RESPONSIBILITIES

The UC Regents is the lead agency with authority to adopt the MMRP. The UC Regents, in coordination with UC Berkeley, will prepare project-specific MMRPs in connection with the Environmental Checklist and approval of later activities under the WVFMP, as described above.

Unless otherwise specified herein, the university is responsible for taking all actions necessary to implement the mitigation measures under its jurisdiction according to the specifications provided for each measure and for demonstrating that the action has been successfully completed. The university will be responsible for implementation of mitigation measures pursuant to Section 15097 of the State CEQA Guidelines.

The university is responsible for overall administration of the MMRP and for verifying that staff members or contractors have completed the necessary actions for each measure (i.e., appropriate amendments to the proposed ordinance).

REPORTING

The university will document and describe the compliance of a later treatment project with the required EPMs and mitigation measures either by adapting the project-specific MMRP table or preparing a separate post-project implementation report.

MITIGATION MONITORING AND REPORTING PROGRAM TABLE

The categories identified in the attached MMRP table are described below.

- **EPMs and Mitigation Measures** – This column provides the verbatim text of the applicable EPM or adopted mitigation measure.
- **Timing** – This column identifies the time frame in which the EPM or mitigation measure will be implemented.
- **Implementing Entity** – This column identifies the party responsible for implementing the EPM or mitigation measure.
- **Verifying/Monitoring Entity** – This column identifies the party responsible for verifying and monitoring implementation of the EPM or mitigation measure.

Mitigation Monitoring and Reporting Program: Overall WVFMP

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
ENVIRONMENTAL PROTECTION MEASURES (EPMs)			
Administrative Environmental Protection Measures			
EPM AD-1 Maintain Site Cleanliness: If trash receptacles are used at treatment sites, UC Berkeley will use fully covered trash receptacles with secure lids (wildlife proof) to contain all food, food scraps, food wrappers, beverages, and other worker generated miscellaneous trash. UC Berkeley will remove all temporary non-biodegradable flagging, trash, debris, and barriers from treatment sites upon completion of project activities.	During and following treatments (for all treatment activities)	UC Berkeley	UC Berkeley
EPM AD-2 Public Notifications of Road and Recreation Area Closures: At least one week before disruption or closure of a public roadway or fire trail, UC Berkeley will update its Facilities Services website with project information and install digital signage at multiple strategic roadway locations notifying the public of project schedules, road closures, and alternative routing.	Prior to treatments (for all treatment activities)	UC Berkeley	UC Berkeley
EPM AD-3 Public Notifications for Prescribed Burning: One to three days before the commencement of prescribed burning operations, UC Berkeley will post signs along the closest public roadway to the treatment area that describe the activity and timing, and identify a designated representative from UC Berkeley (contact information will be provided with the notice) to contact with any questions or smoke concerns.	Prior to pile and broadcast burning	UC Berkeley	UC Berkeley
Aesthetic and Visual Resource Environmental Protection Measures			
EPM AES-1 Avoid Staging within Viewsheds: UC Berkeley will store all treatment-related materials, including vehicles, vegetation treatment debris, and equipment, outside of the viewshed of public trails and roadways to the extent feasible. UC Berkeley will also locate materials staging and storage areas where they will minimize or avoid visual impacts.	Prior to, during, and following treatments (for all treatment activities)	UC Berkeley	UC Berkeley
Archaeological, Historical, and Tribal Cultural Resource Environmental Protection Measures			
EPM CUL-1 Environmental Awareness Training: A qualified archaeologist and/or Native American representative will provide Environmental Awareness Training to all staff, including supervisors, involved with vegetation treatment activities before initiation of a treatment. Training materials will be provided to any new staff over the course of a treatment project. Upon completion of the training, staff will sign a form stating that they attended the training and understand and will comply with the information presented. The training will cover the cultural history of the area; relevant information regarding known archaeological resources; actions to take for the inadvertent discovery of cultural resources, including whom to contact if any potential archaeological resources or artifacts are encountered; applicable laws; and avoidance and minimization measures to be implemented. The training will also underscore the requirement for confidentiality and culturally-appropriate treatment of any discovery of significance to Native Americans and behaviors consistent with Native American Tribal values.	Prior to treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
ENVIRONMENTAL PROTECTION MEASURES (EPMs)			
Air Quality Environmental Protection Measures			
EPM AQ-1 Burn Plan and Smoke Management Plan: UC Berkeley will prepare a burn plan and submit a smoke management plan (SMP) to the Bay Area Air Quality Management District (BAAQMD) for prescribed burns, as required by BAAQMD and in accordance with 17 CCR Section 80160. Burning will only be conducted in compliance with the burn authorization program and SMP approved by BAAQMD.	Prior to prescribed burning	UC Berkeley	UC Berkeley
EPM AQ-2 Minimize Air Emissions: UC Berkeley will implement applicable BAAQMD measures (BAAQMD 2017) to minimize air quality emissions, as appropriate, including the following: ▶ All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) will be watered two times per day. ▶ All haul trucks transporting soil, sand, or other loose material off-site will be covered. ▶ All visible mud or dirt track-out onto adjacent public roads will be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. ▶ All vehicle speeds on unpaved roads will be limited to 15 mph. ▶ Idling times will be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage will be provided for construction workers at all access points. ▶ All construction equipment will be maintained and properly tuned in accordance with manufacturer's specifications. All equipment will be checked by a certified visible emissions evaluator. ▶ Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person will respond and take corrective action within 48 hours. The Air District's phone number will also be visible to ensure compliance with applicable regulations.	Prior to, during, and following treatments (for all treatment activities)	UC Berkeley	UC Berkeley
Biological Resource Environmental Protection Measures			
EPM BIO-1 Material Storage: All material stockpiling and staging areas will be located within designated landings that are outside of sensitive habitats.	During treatments (for all treatment activities)	UC Berkeley	UC Berkeley
EPM BIO-2 Avoid Spread or Introduction of Exotic Plants: The spread or introduction of exotic plant species will be avoided by minimizing soil disturbance to areas during and following treatments. Only native plant seeds or stock will be used for erosion control, as needed. 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 treatment areas.	During and following treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
ENVIRONMENTAL PROTECTION MEASURES (EPMs)			
EPM BIO-3 Let Wildlife Leave Area Unharmed: If any wildlife is encountered during treatment activities, the animal will be allowed to leave the treatment area unharmed and on its own accord.	During treatments (for all treatment activities)	UC Berkeley	UC Berkeley
EPM BIO-4 Environmental Awareness Training: A qualified biologist will provide Environmental Awareness Training to all staff involved with vegetation treatment activities before initiation of a treatment. Training materials will be provided to any new staff over the course of a treatment project. Upon completion of the training, staff will sign a form stating that they attended the training and understand and will comply with the information presented. The training will describe the appropriate work practices necessary to effectively implement the EPMs and mitigation measures and to comply with the state and federal Endangered Species Acts and will include the identification and relevant life history information of sensitive biological resources (e.g., wildlife, plants, habitats) that may potentially occur within the Plan Area.	Prior to treatments (for all treatment activities)	UC Berkeley	UC Berkeley
EPM BIO-5 Delineate Project Areas: UC Berkeley will clearly delineate project areas and restrict access to work crews outside of that area to prevent impacts to adjacent sensitive biological resources.	Prior to treatments (for all treatment activities)	UC Berkeley	UC Berkeley
EPM BIO-6 Access Plan to Minimize Ground Disturbance: UC Berkeley will use existing roads, trails, and former logging paths and minimize ground disturbance from equipment and vehicles (e.g., wheels, tracks, skidding to landings), to the extent feasible. UC Berkeley will develop an access/implementation plan that maps and names all fire roads and/or trails that will be used to reach treatment areas and that details the starting location(s) and direction of progression of treatment in coordination with a qualified biologist.	Prior to and during treatments (for all treatment activities)	UC Berkeley	UC Berkeley
Geology, Soils, and Mineral Resource Environmental Protection Measures			
EPM GEO-1 Suspend Disturbance During and After Precipitation: Ground-disturbing activities will not occur when soils are saturated as defined in 14 CCR 895.1, or within one week following an inch or more of rain, unless the ground is consistently firm and can support the weight of machinery or livestock (during managed herbivory) without creating ruts.	During treatments (for all treatment activities)	UC Berkeley	UC Berkeley
EPM GEO-2: Stabilize Disturbed Soil Areas: Bare soil will not be exposed in over 50 percent of the site, and no single bare patch will be larger than 15 square feet. UC Berkeley will stabilize newly created bare soil with mulch or equivalent, to minimize the potential for erosion and sediment discharge. In these areas, mulch/chip depth will be 3-6 inches over at least 90 percent of the exposed area, and will be placed as soon as possible after treatment activities and before October 15.	During and following treatments (for all treatment activities)	UC Berkeley	UC Berkeley
EPM GEO-3 Minimize Erosion: To minimize erosion, UC Berkeley will prohibit heavy equipment use where slopes are steeper than 30 percent. During managed herbivory, grazing animals will be removed from an area if accelerated soil erosion is observed.	During treatments utilizing heavy equipment and managed herbivory	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
ENVIRONMENTAL PROTECTION MEASURES (EPMs)			
EPM GEO-4 Drain Stormwater via Water Breaks: UC Berkeley will drain compacted and/or bare linear treatment areas capable of generating storm runoff via water breaks using the spacing and erosion control guidelines contained in Sections 914.6, 934.6, and 954.6(c) of the California Forest Practice Rules (2020). Where water breaks cannot effectively disperse surface runoff, including where water breaks cause surface runoff to be concentrated on downslopes, other erosion controls will be installed as needed to eliminate the concentration of runoff, such as application of mulch or installation of check dams. Water bars and rolling dips will be monitored and maintained for at least three years following the first winter of installation to ensure they are functioning properly.	During and following treatments (for all treatment activities)	UC Berkeley	UC Berkeley
EPM GEO-5 Steep Slopes: UC Berkeley will require a Registered Professional Forester (RPF) or licensed geologist to evaluate treatment areas with slopes greater than 50 percent for unstable areas (areas with potential for landslide) and unstable soils (soil with moderate to high erosion hazard). If unstable areas or soils are identified within the treatment area, are unavoidable, and will be potentially directly or indirectly affected by a treatment, a licensed geologist (P.G. or C.E.G.) will determine the potential for landslide, erosion, of other issues related to unstable soils and identity measures that will be implemented by UC Berkeley such that substantial erosion or loss of topsoil will not occur.	Prior to treatments (for all treatment activities)	UC Berkeley	UC Berkeley
Hazards and Hazardous Materials Environmental Protection Measures			
EPM HAZ-1 Maintain All Equipment: UCB will maintain all diesel- and gasoline-powered equipment per manufacturer's specifications and in compliance with all state and federal emissions requirements, as well as all equipment used for herbicide application. Maintenance records will be available for verification. Before the start of treatment activities, UC Berkeley will inspect all equipment for leaks and inspect everyday thereafter until equipment is removed from a treatment site. Any equipment found leaking will be promptly removed.	Prior to and during treatments Prior to and during mechanical treatments, manual treatments utilizing machinery, and herbicide treatments	UC Berkeley	UC Berkeley
EPM HAZ-2 Spill Prevention and Response Plan: UC Berkeley or the licensed Pesticide Control Advisor (PCA) will prepare a Spill Prevention and Response Plan (SPRP) before beginning any herbicide treatment activities to provide protection to onsite workers, the public, and the environment from accidental leaks or spills of herbicides, adjuvants, or other potential contaminants. The SPRP will include (but not be limited to): ▸ a map that delineates staging areas, and storage, loading, and mixing areas for herbicides; ▸ a list of items required in an onsite spill kit that will be maintained throughout the life of the activity; and ▸ procedures for the proper storage, use, and disposal of any herbicides, adjuvants, or other chemicals used in vegetation treatment.	Prior to herbicide treatments	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
ENVIRONMENTAL PROTECTION MEASURES (EPMs)			
EPM HAZ-3 Comply with Herbicide Application Regulations: UC Berkeley will obtain all required licenses and permits before herbicide application. UC Berkeley will prepare all herbicide applications to do the following: ▸ Be implemented consistent with recommendations prepared annually by a licensed PCA. ▸ Comply with all appropriate laws and regulations pertaining to the use of pesticides and safety standards for employees and the public, as governed by the EPA, DPR, and applicable local jurisdictions. ▸ Adhere to label directions for application rates and methods, storage, transportation, mixing, container disposal, PPE, and weather limitations to application such as wind speed, humidity, temperature, and precipitation. ▸ Be applied by an applicator appropriately licensed by the state.	Prior to herbicide treatments	UC Berkeley	UC Berkeley
EPM HAZ-4 Triple Rinse Herbicide Containers: UC Berkeley will triple rinse all herbicide and adjuvant containers with clean water at an approved site, and dispose of rinsate by placing it in the batch tank for application per 3 CCR Section 6684. Disposal of non-recyclable containers will be at legal dumpsites. Disposal of all herbicides will follow label requirements and waste disposal regulations.	Prior to, during, and following herbicide treatments	UC Berkeley	UC Berkeley
EPM HAZ-5 Minimize Herbicide Drift: UC Berkeley will employ the following parameters during foliar spray herbicide applications to minimize drift: ▸ application will cease when weather parameters exceed label specifications or when sustained winds at the site of application exceed 7 miles per hour (whichever is more conservative), as measured onsite with a hand-held anemometer or similar device immediately prior to application; ▸ spray nozzles will be configured to produce the largest appropriate droplet size to minimize drift; ▸ low nozzle pressures (30-70 pounds per square inch) will be utilized to minimize drift; and ▸ spray nozzles will be kept within 24 inches of vegetation during spraying.	During foliar spray herbicide treatments	UC Berkeley	UC Berkeley
EPM HAZ-6 Notification of Herbicide Use in the Vicinity of Public Areas: Signage will be posted at each pedestrian entry point notifying the public of upcoming and recent herbicide application locations, and footpaths and trails will be closed to the public during herbicide application. Signs will be posted before the start of treatment and notification will remain in place for at least 24 hours after treatment ceases.	Prior to, during, and following herbicide treatments	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
ENVIRONMENTAL PROTECTION MEASURES (EPMs)			
Hydrology and Water Quality Environmental Protection Measures			
EPM HYD-1 Water Quality Protections: UC Berkeley will implement the following measures to minimize impacts to water quality from treatments: ▸ Environmentally sensitive areas such as waterbodies, wetlands, or riparian areas will be identified and excluded from managed herbivory project areas using temporary fencing or active herding. A buffer of 50 feet will be maintained between sensitive and actively grazed areas. ▸ No cut material will be left within 20 feet of any watercourse or swale. A watercourse is defined as any well-defined channel (including human-made channels) with distinguishable bed and bank showing evidence of having contained flowing water indicated by deposits of rock, sand, gravel, or soil. A swale is a low-lying area between high points that conveys runoff but lacks a defined bed and bank. ▸ Within 50 feet of watercourses, trees will only be cut down using hand-held equipment or mechanical equipment that can be positioned 50 feet or more from a watercourse that use articulated arms. Fuels, heavy equipment, or other potentially hazardous materials will be kept at least 50 feet from watercourses to prevent accidental leaks or spills from entering the watercourse. ▸ Pile burning will not be conducted within 25 feet of a watercourse. ▸ Burn piles will not exceed 20 feet in length, width, or diameter, except when on landings, road surfaces, or on contour to minimize the spatial extent of soil damage. ▸ Where landings are located near watercourses, brow logs and orange safety netting will be installed to prevent chip movement into watercourses or natural drainage blockages. Chips would not be allowed to accumulate around fencing and cut logs. ▸ All soils, chips, and debris will be removed from ditches and drainage features of public roads at the end of each work day.	Prior to, during, and following treatments (for all treatment activities)	UC Berkeley	UC Berkeley
EPM HYD-2 Avoid Impacts to Non-Target Vegetation and Sensitive Resources from Herbicides: UC Berkeley will implement the following measures when applying herbicides: ▸ Locate herbicide mixing sites in areas devoid of vegetation and where there is no potential of a spill reaching non-target vegetation or a waterway. ▸ No herbicide will be applied during precipitation events or if precipitation is forecasted to occur within 24 hours before or after treatment activities. ▸ Use only herbicides labeled for use in aquatic environments when working in riparian habitats or other areas where there is a possibility the herbicide could come into direct contact with water. Only hand application of herbicides will be allowed in riparian habitats and only during low-flow periods or when seasonal streams are dry. ▸ Herbicides that are not approved for use in aquatic environments would not be used, mixed, or stored within 60 feet of any surface waters, wetlands, or riparian areas.	During herbicide treatments	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
ENVIRONMENTAL PROTECTION MEASURES (EPMs)			
Noise Environmental Protection Measures			
EPM NOI-1 Limit Heavy Equipment Use to Daytime Hours: Operation of heavy equipment (heavy off-road equipment, tools, and delivery of equipment and materials) will occur during daytime hours if such noise would be audible to sensitive receptors (e.g., residences) and will not be scheduled during the university's Reading/Review/Recitation Week and finals week.	During treatments utilizing heavy equipment	UC Berkeley	UC Berkeley
EPM NOI-2 Maintain Equipment: All mechanical equipment and hand-operated power tools will be used and maintained according to manufacturer specifications. All diesel- and gasoline-powered equipment will be equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations.	Prior to and during treatments utilizing heavy equipment and/or chainsaws	UC Berkeley	UC Berkeley
EPM NOI-3 Close Equipment Engine Shrouds. Equipment engine shrouds will be closed during equipment operation.	During treatments utilizing heavy equipment and/or chainsaws	UC Berkeley	UC Berkeley
EPM NOI-4 Limit Equipment Idling: All motorized construction equipment will be shut down when not in use. Idling of equipment and haul trucks will be limited to 5 minutes.	During treatments utilizing heavy equipment and/or chainsaws	UC Berkeley	UC Berkeley
Wildfire Environmental Protection Measures			
EPM WIL-1 Prohibit Treatments During High Fire Danger: Vegetation treatments will not occur during extreme fire danger conditions such as red flag warnings, as posted by the local CAL FIRE unit. UC Berkeley will define the conditions under which work can proceed. It will be UC Berkeley's responsibility to determine the fire danger before the start of each work day and may determine to limit or cease operations to mitigate wildfire risk without a red flag warning. In addition, during the dry season, a ground inspection for fire will occur within 2 hours of felling, yarding, and mechanical loading activities ceasing each day, per Section 918.8, 958.8 of the California Forest Practice Rules (2020).	Prior to and during treatments (for all treatment activities)	UC Berkeley	UC Berkeley
EPM WIL-2 Require Spark Arrestors: UC Berkeley will require all mechanized hand tools to have federal- or state-approved spark arrestors.	During manual treatments utilizing mechanized hand tools	UC Berkeley	UC Berkeley
EPM WIL-3 Require Fire Suppression Tools: UC Berkeley will require tree cutting crews to carry one fire extinguisher per chainsaw. Each vehicle would be equipped with one long-handled shovel and one axe or Pulaski consistent with PRC Section 4428. A fire suppression resources inventory will be submitted to the local CAL FIRE unit before prescribed burning as required by 14 CCR Section 918.	During manual and mechanical treatments; prior to broadcast and pile burning	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
Aesthetics and Visual Resource Mitigation Measures			
Mitigation Measure AES-2: Conduct Visual Reconnaissance Prior to Implementing All Treatment Types, and Relocate or Feather and Screen Publicly Visible Treatment Areas UC Berkeley will conduct a visual reconnaissance of the treatment area before establishing ESTs, FHRs, FBs, and TRAs to observe the surrounding landscape and determine if public viewing locations, including scenic vistas, public trails, and state scenic highways, have views of the proposed treatment area. If none are identified, the treatment may be implemented without additional visual mitigation. If UC Berkeley identifies public viewing points, including heavily used scenic vistas, public trails, recreation areas, with lengthy views (i.e., longer than a few seconds) of a proposed treatment area, UC Berkeley will, before implementation, identify any change in location of the treatment site to reduce its visibility from public viewpoints. If no changes exist that would reduce impacts to public viewers and achieve the intended wildfire risk reduction objectives of the proposed treatment, UC Berkeley will thin and feather adjacent vegetation to break up the linear edges of treatment areas and strategically preserve vegetation at the edge of the treatment area, to help screen public views and minimize the contrast between the treatment area and surrounding vegetation.	Prior to treatments (for all treatment activities)	UC Berkeley	UC Berkeley
Air Quality Mitigation Measures			
Mitigation Measure AQ-1: Limit the Number and Mix of Crews and/or Use Electric Chainsaws for Mechanical and/or Manual Treatment Crews Operating on the Same Day UC Berkeley shall limit the number and mix of mechanical and manual treatment crews working on the same day in the Plan Area and/or use only electric-powered hand-held chain saws such that the combined levels of ROG or the combined levels of NOX will not exceed BAAQMD's threshold of 54 lb/day. Prior to the start of mechanical or manual treatment activity involving more than one treatment crew on a single day, UC Berkeley shall develop a plan for ensuring that the combined emissions of ROG or NOX generated by all the crews that would operate simultaneously on any single day would not exceed 54 lb/day. UC Berkeley shall only allow mechanical or manual treatment activity to occur with a plan in place that ensures emissions of ROG or NOX would not exceed 54 lb/day. For the purpose of implementing this mitigation, a mechanical crew consists of up to nine workers using up to nine pieces of power equipment, including heavy equipment (e.g., feller/bunchers, masticators); and a manual treatment crew consists of up to 15 workers using up to 15 pieces of handheld power equipment (e.g., chain saws, brush cutters, weed whips). To achieve this, UC Berkeley may determine the number and mix of mechanical and manual treatment crews using the daily emission levels for one crew presented in Table 3.3-5. For instance, UC Berkeley will not allow more than one manual treatment crew to operate on the same day because the combined level of ROG emissions from two manual treatment crews would be 58.8	Prior to and during manual and mechanical treatments	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
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lb/day, which would exceed BAAQMD's threshold of 54 lb/day. UC Berkeley could allow two mechanical treatment crews to be active on the same day, or allow one mechanical treatment crew and one manual treatment crew to be active on the same day, because the combined level of emissions under these scenarios would not exceed BAAQMD's threshold of 54 lb/day for ROG or NOX. Rather than, or in combination with, limiting the number and mix of mechanical and manual treatment crews working on the same day to reduce ROG and NOX emissions below BAAQMD thresholds, UC Berkeley may use electric powered hand-held chain saws instead of petroleum powered chainsaws. The use of electric powered chainsaws would eliminate all ROG and NOX emissions generated by petroleum-powered chain saws and result in lower daily emissions of ROG and NOX generated by mechanical and manual treatment crews. Daily emission levels of different treatment crew types using electric chain saws instead of petroleum-powered chain saws are presented in Table 3.3-7. For example, using the daily emission levels presented in Table 3.3-7, UC Berkeley could allow up to two mechanical treatment crews and one manual treatment crew, which would generate combined daily emissions levels of 10.9 lb/day of ROG and 50.2 lb/day of NOX. UC Berkeley will only implement these combinations if all the crews would use electric chainsaws in place of any hand-held petroleum powered chain saws. If needed, UC Berkeley will use a mix of multiple treatment crews with and without electric chainsaws if, based on the daily emission levels presented in Table 3.3-5 and Table 3.3-7, the combined levels of ROG and NOX would not exceed BAAQMD's recommended threshold of 54 lb/day.			
Mitigation Measure AQ-2: Prevent and Minimize Smoke Emissions and Alert the Public of Upcoming Prescribed Burns UC Berkeley shall incorporate all feasible measures to prevent and minimize smoke emissions as part of the precautionary measures required in SMPs, pursuant to BAAQMD Regulation 5 and EPM AQ-1, for the unintended occurrence when a prescribed burn may go out of prescription and adversely affect offsite receptors. Additionally, in accordance with EPM AD-3, UC Berkeley shall alert the public to planned prescribed burns and give them adequate notice to take precautionary measures, such as closing windows or temporarily vacating the area, to reduce the potential for exposure.	Prior to and during broadcast and pile burning	UC Berkeley	UC Berkeley
Archaeological, Historical, and Tribal Cultural Resource Mitigation Measures			
Mitigation Measure CUL-1a: Conduct Archaeological Surveys Before conducting treatment activities that involve ground disturbance or prescribed burning in an area not previously surveyed for cultural resources (refer to Attachment A, Figure 3 of the Cultural Resources Sensitivity Analysis [UC Berkeley 2020] for surveyed areas), UC Berkeley will retain a qualified archaeologist to conduct a field survey for archaeological resources. If archaeological resources are found during the field survey, the resources will be inventoried using appropriate state record forms and submitted to the NWIC. The resources will be evaluated for NRHP and CRHR significance. If the resources are found to be significant, appropriate measures will be	Prior to broadcast and pile burning and ground disturbing treatments	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
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identified by the qualified cultural resource specialist and Native American representatives, implemented at the direction of UC Berkeley, and documented in the project record. Appropriate measures to minimize impacts to significant resources could include avoidance, capping, or data recovery excavations of the finds. Fencing will be installed around any resources to be avoided including a buffer area. Justification will be included for any tribal recommendations that are not implemented. If identified resources cannot be avoided, an archaeological monitor will be present during any ground disturbance or prescribed burning in the vicinity of discovered resources. The monitoring period will be determined by the qualified cultural resource specialist. If the resource is determined to not be significant, or if no resources are present within the project site, no further mitigation would be required unless there is a discovery during a treatment activity. If additional archaeological resources are found during treatment activities, the procedures identified in Mitigation Measure CUL-1b for the discovery of unknown resources will be followed.			
Mitigation Measure CUL-1b: Protect Inadvertent Discoveries of Unique Archaeological Resources or Subsurface Historical Resources If any prehistoric or historic-era subsurface archaeological features or deposits, including locally darkened soil ("midden"), that could conceal cultural deposits, are discovered during treatment activities, all ground-disturbing activity and prescribed burning within 100 feet of the resource will be halted and a qualified cultural resource specialist will assess the significance of the find. If the find is determined to be significant by the qualified cultural resource specialist (i.e., because the find constitutes a unique archaeological resource, subsurface historical resource, or tribal cultural resource), the cultural resource specialist in consultation with Native American representatives will develop and implement appropriate procedures such that the integrity of the resource is protected (i.e., the resource stays intact and complete) and ensure that no additional resources are affected. These procedures will be documented in the project record. For any recommendations from Native American representatives that are not implemented, the reasons for not implementing the recommendations will be documented in the project record. Procedures could include, but would not be limited to, preservation in place, archival research, subsurface testing, or contiguous block unit excavation and data recovery.	During broadcast and pile burning and ground disturbing treatments	UC Berkeley	UC Berkeley
Mitigation Measure CUL-1c: Avoid and Protect Known Unique Archaeological Resources For archaeological resources that are known or those that are identified during surveys conducted pursuant to Mitigation Measure CUL-1a, and have been determined by a qualified archaeologist to qualify as a unique archaeological resource, they will be appropriately marked in consultation with Native American representatives and their locations communicated to workers to ensure protection and avoidance. Confidentiality of cultural resources sites will be maintained with minimal disclosure of site locations. If identified resources cannot be avoided, an archaeological monitor will be present during any ground disturbance or prescribed burning in the vicinity of discovered resources.	Prior to and during treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
Biological Resource Mitigation Measures			
Mitigation Measure BIO-1a: Conduct Project-level Biological Reconnaissance Survey During the early planning stages of later treatment projects implemented under the WVFMP, the following measure will apply: A data review and biological reconnaissance survey will be conducted within the treatment area by a qualified biologist no more than one year prior to starting initial treatment or treatment maintenance. The qualified biologist must be familiar with the life histories and ecology of species in the San Francisco Bay Area and must have experience conducting field surveys of relevant species or resources, including protocol-level surveys for individual species, if applicable. The data reviewed will include the biological resources setting, species tables, and habitat information in this EIR. It will also include review of the best available, current data for the area, including vegetation mapping data, species distribution/range information, CNDDB, CNPS Inventory of Rare and Endangered Plants of California, relevant Biogeographic Information and Observation System (BIOS) queries, and relevant general and regional plans. BIOS is a web-based system that enables the management and visualization of biogeographic data collected by CDFW and partner organizations. The qualified biologist will assess the habitat suitability of the treatment area for all special-status plant and wildlife species as well as sensitive habitats identified as having potential to occur in the Plan Area (refer to Section 3.5.1, "Environmental Setting"), and will identify any wildlife nursery sites (e.g., heron rookeries, bat maternity roosts, monarch overwintering colonies) within the Plan Area. The biologist will provide a letter report to UC Berkeley with evidence to support a conclusion as to whether special-status species and sensitive habitats are present or are likely to occur within the treatment area. ▸ If the reconnaissance survey identifies no potential for special-status plant, wildlife species, or sensitive habitats to occur, UC Berkeley will not be required to apply any additional mitigation measures under Impact BIO-1 through BIO-4. ▸ If the qualified biologist determines that there is potential for special-status species or sensitive habitats to be present within the treatment area, the appropriate biological mitigation measures, identified below, will be implemented.	Prior to treatments (for all treatment activities)	UC Berkeley	UC Berkeley
Mitigation Measure BIO-1b: Conduct Special-Status Plant Surveys and Implement Avoidance Measures and Mitigation If it is determined that suitable habitat for special-status plant species is present within a treatment area (e.g., through implementation of Mitigation Measure BIO-1a) the following measures will be implemented: ▸ Prior to implementation of treatment activities and during the blooming period for the special-status plant species with potential to occur in the treatment area (see table below), as determined during implementation of Mitigation Measures BIO-1a, a qualified botanist will	Prior to, during, and following treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
conduct protocol-level surveys for special-status plants within the treatment area following survey methods from CDFW's Protocols for Surveying and Evaluating Impacts on Special Status Native Plant Populations and Natural Communities (CDFW 2018). The qualified botanist will 1) be knowledgeable about plant taxonomy, 2) be familiar with plants of the San Francisco Bay Area region, including special-status plants and sensitive natural communities, 3) have experience conducting floristic botanical field surveys as described in CDFW 2018, 4) be familiar with the California Manual of Vegetation (Sawyer et al. 2009 or current version, including updated natural communities data at http://vegetation.cnps.org/), and 5) be familiar with federal and state statutes and regulations related to plants and plant collecting. ▪ If protocol-level surveys, consisting of at least two survey visits (e.g., early blooming season and later blooming season) during a normal weather year, have been completed in the 5 years before implementation of the treatment project and no special-status plants were found, and no treatment activity occurred after the protocol-level survey, treatment may proceed in that area without additional plant surveys. ▸ If special-status plants are not found, the botanist will document the findings in a letter report to UC Berkeley and no further mitigation will be required. ▸ If special-status plant species are found, the plant will be avoided completely, if feasible (i.e., project objectives can still be met). This may include establishing a no-disturbance buffer around the plants and demarcation of this buffer by a qualified biologist or botanist using flagging or high-visibility construction fencing. The size of the buffer will be determined by the qualified biologist or botanist and will be large enough to avoid direct or indirect impacts on the plant. ▸ If special-status plant species are found that cannot be avoided during treatments because the treatment objectives cannot be met if the special-status plant is avoided, the following will be implemented: ▪ The qualified botanist will determine if the special-status plant population will benefit from treatment in the occupied habitat area even though some of the individual plants may be adversely affected during treatment activities. If the qualified botanist determines that treatment activities will be beneficial to a special-status plant population, no compensatory mitigation will be required. For a treatment to be considered beneficial to special-status plants, the qualified botanist will demonstrate that habitat function (i.e., the arrangement and capability of habitat features to provide refuge, foraging, and reproduction habitat to plants and animals, and thereby contribute to the conservation of biological and genetic diversity and evolutionary processes) is expected to improve with implementation of the treatment such that special-status plant populations would expand, regenerate, or display increased vigor after treatment implementation. This determination will consider and cite scientific studies demonstrating that the species or a similar species has benefitted from			

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
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increased sunlight from canopy opening, eradication of invasive species, or otherwise reduced competition for resources. This determination will be documented in the survey results letter report. UC Berkeley may consult with CDFW and/or USFWS for technical information regarding this determination. ▪ **Plants with California Rare Plant Rank 1, 2, or 3**. If a qualified botanist determines that treatment activities will not be beneficial to a special-status plant population and the species is not listed under ESA, CESA, or NPPA, the qualified botanist will determine if treatment would substantially reduce the abundance, distribution, and viability of local and regional populations as defined by the loss of special-status plants restriction the range of the plant, or substantial modification of habitat function such that the habitat would be rendered unsuitable. The qualified botanist will demonstrate that the abundance, distribution, and viability of local and regional populations of the specific species found would be maintained with implementation of the treatment; this will be documented in the survey results letter report. If the qualified botanist determines that the abundance, distribution, and viability of local and regional populations will not be maintained with implementation of the treatment, UC Berkeley will prepare a Compensatory Mitigation Plan. ▪ **Federally or State-Listed Plants**. If a qualified botanist determines that treatment activities will not be beneficial to the plant and the species is listed under ESA, CESA, or NPPA, the qualified botanist will determine if treatment would damage or kill listed plants, or adversely modify their habitat resulting in reduced growth and reproduction or death and loss of listed plant occurrences. This determination will be documented in the survey results letter report. If the qualified botanist determines that treatment will damage or kill listed plants, or adversely modify their habitat resulting in reduced growth and reproduction or death and loss of listed plant occurrences, UC Berkeley will prepare a Compensatory Mitigation Plan. ▸ If a Compensatory Mitigation Plan is warranted, the following will be implemented: ▪ The Compensatory Mitigation Plan will describe the appropriate conservation measures and compensatory mitigation strategy being implemented to compensate for unavoidable losses of special-status plants. The plan will address direct and indirect impacts that could occur as a result of treatment activities and will implement the conservation measures and compensatory mitigation to ensure that treatment will not result in a net loss of the special-status plant. Conservation measures and compensatory mitigation may include preserving and enhancing existing populations, creating off-site populations on mitigation sites through seed collection or transplantation, and/or restoring or creating suitable habitat, and must meet the success criteria described below. If the special-status plant taxa are listed under ESA, CESA, or NPPA, the plan will be submitted to CDFW and/or USFWS (as appropriate) for review and comment. ▪ Success criteria for preserved and compensatory populations would include:			

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▪ The extent of occupied area and plant density (number of plants per unit area) in compensatory populations would be equal to or greater than the affected occupied habitat.
▪ Compensatory and preserved populations would be self-producing. Populations would be considered self-producing when:
  ▪ plants reestablish annually for a minimum of five years with no human intervention such as supplemental seeding; and
  ▪ reestablished and preserved habitats contain an occupied area and flower density comparable to existing occupied habitat areas in similar habitat types in the treatment area vicinity.
▪ If off-site conservation includes dedication of conservation easements, purchase of mitigation credits, or other off-site conservation measures, the details of these measures would be included in the plan, including information on responsible parties for long-term management, conservation easement holders, long-term management requirements, success criteria such as those listed above and other details, as appropriate to target the preservation of long term viable populations.
  ▪ If relocation efforts are part of the Compensatory Mitigation Plan, the plan would include details on the methods to be used, including collection, storage, propagation, receptor site preparation, installation, long-term protection and management, monitoring and reporting requirements, success criteria such as those listed above, and remedial action responsibilities should the initial effort fail to meet long-term conservation requirements.			

Mitigation Measure BIO-2a: Conduct Focused Habitat Assessment for Alameda Whipsnake If it is determined that suitable habitat for Alameda whipsnake is present within a treatment area (e.g., through implementation of Mitigation Measure BIO-1a), the following measures will be implemented during the planning stages for later treatment projects (including initial treatment activities and treatment maintenance) under the WVFMP: ▸ A qualified biologist will conduct a habitat assessment within a treatment area to determine the likelihood of the species to be present. To be qualified, the biologist will: 1) be knowledgeable in Alameda whipsnake life history and ecology, 2) be able to correctly identify Alameda whipsnake and habitats, 3) have experience conducting field surveys of relevant resources, 4) be knowledgeable about state and federal laws regarding the protection of special-status species, and 5) have experience using CDFW's CNDDB. The habitat assessment will include, but will not be limited to: ▪ Identification or verification of the vegetation communities present in the treatment area, using the types presented in Figure 3.5-3 of this EIR;	Prior to treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
■ Consideration of known occurrences within the Plan Area; ■ Description of the treatment project, including proposed treatment types and treatment activities; ■ Analysis of the type and likelihood of impacts on Alameda whipsnake as a result of treatment project implementation; and ■ Potential treatment project modifications or additional measures that may avoid and minimize mortality, injury, and disturbance of Alameda whipsnake. ▶ Results of the habitat assessment will be submitted to UC Berkeley for review and consideration.			
Mitigation Measure BIO-2b: Implement Alameda Whipsnake Avoidance and Minimization Measures Regardless of the results of the reconnaissance-level survey required under Mitigation Measure BIO-1a or habitat assessment required under Mitigation Measure BIO-2a, before implementation of treatment projects (including initial treatment activities and treatment maintenance) under the WVFMP, the following measures will be incorporated into project design: ▶ A qualified biologist will conduct a pre-treatment survey for Alameda whipsnake within 24 hours of initiation of initial treatment activities or treatment maintenance in treatment area. In addition, a qualified biologist will conduct a daily pre-activity Alameda whipsnake survey sweep for treatments that require more than one day to implement. If an Alameda whipsnake is observed, the qualified biologist will identify actions sufficient to avoid impacts on the species (e.g., halt work) and to allow it to leave the area on its own volition. ▶ A qualified biologist will monitor all treatment activities. The biologist will monitor the implementation of treatment activities to look for whipsnake and to ensure the measures to avoid impacts on the species are followed. The biologist will monitor truck and equipment access (i.e., the biologist will walk in front of truck or equipment on access roads ordinarily closed to vehicle traffic to look for whipsnake). ▶ UC Berkeley (or contractors) will immediately (i.e., the same day) process (remove completely from the treatment area, chip, gasify, or permanently place within the treatment area for soil stabilization) all cut materials (i.e., brush, stems, slash, and logs) as they are produced to avoid attracting Alameda whipsnake to the vegetation piles. ▶ If processing within the same day is not feasible, UC Berkeley (or contractors) will determine suitable location(s) outside of suitable scrub and directly adjacent woodland/grassland habitat (e.g., within landings or temporary refuge areas), in coordination with a qualified biologist, for temporary storage of cut materials that cannot be processed immediately. Log trailers could be used as biomass repositories and removed when full. If vegetation must be removed to create a temporary storage location, UC Berkeley (or contractors) will remove understory vegetation first to facilitate visibility of Alameda whipsnake by a qualified biologist, followed by trees. Then,	Prior to and during treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
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UC Berkeley (or contractors) will install temporary fencing to exclude Alameda whipsnake. If temporary exclusion fencing is installed, UC Berkeley (or contractors) will prepare an exclusion fencing plan that identifies the size and location of temporary staging areas, the fencing materials to be used, installation instructions, and monitoring requirements. Cut vegetation that will be burned in piles during biomass disposal and utilization will not be placed on top of burrows. Burn piles will be lit from one end (uphill side on slopes) to allow Alameda whipsnakes, that may be using the pile for refuge, to escape. Piles will not be burned during the winter when Alameda whipsnake may be using them as winter retreats (generally November through February or March, as determined by a qualified biologist based on temperature and weather conditions). ▶ In suitable habitat where suitable winter retreats may be present (e.g., within native scrub habitat not degraded by substantial nonnative tree overstory, rock outcrops within approximately 50 feet of scrub habitat), as determined by a qualified biologist, UC Berkeley (or contractors) will avoid ground disturbance and use of heavy equipment during the winter (generally November through February or March, as determined by a qualified biologist based on temperature and weather conditions). ▶ Unless removal is required to meet program objectives, UC Berkeley (or contractors) will avoid uprooting any native species within native scrub habitat, as determined by a qualified biologist, and in other habitat, UC Berkeley (or contractors) will retain native species. Based on the results of the habitat assessment required under Mitigation Measure BIO-2a in this EIR, a qualified biologist will determine if any of the following would occur after implementation of the measures listed above: residual loss of habitat function for Alameda whipsnake; injury or mortality of Alameda whipsnake; or disturbance of Alameda whipsnake that could substantially disrupt essential behavior patterns (e.g., breeding, feeding, or sheltering) to such an extent that injury or mortality is likely. If a qualified biologist determines that these impacts are unlikely, treatment may proceed. If a qualified biologist determines that loss of habitat function for Alameda whipsnake is likely; injury or mortality of Alameda whipsnake is likely; or disturbance of Alameda whipsnake is likely which could substantially disrupt essential behavior patterns (e.g., breeding, feeding, or sheltering) to such an extent that injury or mortality is likely, after implementing the measures identified above, then additional feasible measures will be implemented, as determined in consultation with a qualified biologist. These measures may include the following (and potentially others not listed below): ▶ UC Berkeley (or contractors) will not conduct treatment activities within 100 feet of scrub habitat in areas where it is likely that Alameda whipsnake could occur, as identified by a qualified biologist. ▶ UC Berkeley (or contractors) will only operate heavy equipment from developed or disturbed areas (e.g., existing roads).			

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
▸ UC Berkeley (or contractors) will limit vegetation removal to trees/clumps of trees and nonnative shrubs (e.g., French broom) that can be removed from developed areas (e.g., established roads) or bare areas (i.e., disturbed areas devoid of vegetation and burrows) without ground disturbance outside the road or bare area. The biological monitor will inspect trees and shrubs for whipsnake immediately before removal. ▸ UC Berkeley (or contractors) will avoid ground disturbance during vegetation removal (i.e., the stump and roots will remain at a height such that ground disturbance is avoided). UC Berkeley (or contractors) will also avoid disturbance of shrub understory and duff, bark, or branches built up at the base of a tree. If disturbance of shrub understory and duff, bark, or branches at the base of the tree is not feasible (i.e., the stump height remains too high to meet fuel-reduction objectives), UC Berkeley (or contractors) may clear duff, bark, or branches built up at the base of the tree by hand only to the extent needed, while allowing for visibility of Alameda whipsnake by the biological monitor, before cutting the tree closer to the base. UC Berkeley (or contractors) will not disturb roots or soil during hand work. ▸ UC Berkeley (or contractors) will avoid disturbance to suitable rock outcrop habitat by maintaining rock and native shrubs within 50 feet of rock outcroppings. If a qualified biologist determines that disturbance, injury, or mortality of Alameda whipsnake cannot be avoided through implementation of additional measures, then UC Berkeley would consult with CDFW and USFWS before treatment activities occur and implement any additional measures, including avoidance or compensatory actions, determined through consultation and/or required by incidental take authorization to mitigate impacts on Alameda whipsnake pursuant to CESA and ESA. These additional measures may include installation of exclusion fencing around treatment areas, purchase of credits at a conservation bank, creation of additional habitat, adaptive management strategies, and/or long-term monitoring of treated habitat within the Plan Area to determine whether treatment has improved habitat for Alameda whipsnake. No actions that could adversely affect Alameda whipsnake will be allowed if disturbance, injury, or mortality of Alameda whipsnake could result, unless consultation with CDFW and USFWS is completed and additional measures are implemented as required through consultation.			
Mitigation Measure BIO-2c: Conduct Protocol-Level Surveys for California Red-Legged Frog and Implement Additional Avoidance and Minimization Measures If it is determined that a treatment area is within 500 feet of the UC Berkeley Botanical Garden pond (e.g., through implementation of Mitigation Measure BIO-1a), the following measures will be implemented during the planning stages for later treatment projects under the WVFMP: ▸ Protocol-level surveys for California red-legged frog will be conducted within the pond in accordance with the USFWS "Revised Guidance on Site Assessments and Field Surveys for the California Red-Legged Frog" (USFWS 2005). Up to eight surveys will be conducted between January and September, including two day surveys and four night surveys during the breeding	Prior to and during treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
season (approximately late November to April) and one day and one night survey during the nonbreeding season (July 1–September 30). The survey period will extend over a period of at least six weeks. ▸ If no California red-legged frogs are detected, copies of data sheets, field notes, and all other supporting documentation will be provided to the appropriate USFWS Office for review. If the results of the protocol-level surveys are accepted by USFWS, further mitigation is not required. ▸ If California red-legged frogs are detected within the pond, no additional surveys will be conducted, and UC Berkeley will notify USFWS in writing within three working days of the detection. ▸ If California red-legged frogs are detected within the pond, then treatments within 500 feet of the pond may result in disturbance, injury, or mortality of the species. A qualified biologist will determine if any of the following are likely after implementation of the EPMs and Mitigation Measure HYD-1: residual loss of habitat function for California red-legged frog; injury or mortality of California red-legged frog; or disturbance of California red-legged frog which could substantially disrupt essential behavior patterns (e.g., breeding, feeding, or sheltering) to such an extent that injury or mortality is likely. ▪ If a qualified biologist determines that habitat function for California red-legged frog is likely to be maintained; injury or mortality of California red-legged frog is unlikely; and disturbance of California red-legged frog is not anticipated which could substantially disrupt essential behavior patterns (e.g., breeding, feeding, or sheltering) to such an extent that injury or mortality is likely, with implementation of the EPMs and Mitigation Measure HYD-1, treatment project implementation may proceed. ▪ If a qualified biologist determines that residual loss of habitat function for California red-legged frog is likely; injury or mortality of California red-legged frog is likely; or disturbance of California red-legged frog is likely which could substantially disrupt essential behavior patterns (e.g., breeding, feeding, or sheltering) to such an extent that injury or mortality is likely, UC Berkeley will consult with USFWS and implement any additional measures determined through consultation and/or required by incidental take authorization. Measures may include but are not limited to seasonal restrictions, exclusion fencing, relocation of frogs, and compensatory mitigation.			
Mitigation Measure BIO-2d: Conduct Surveys for Western Pond Turtle, Implement Avoidance Measures, and Relocate Individuals If it is determined that suitable aquatic or upland habitat for western pond turtle is present within a treatment area (e.g., through implementation of Mitigation Measure BIO-1a), the following measures will be implemented within 24 hours before implementation of treatment activities:	Prior to and during treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
▸ A qualified biologist familiar with the life history of western pond turtle and experience performing surveys for western pond turtle will conduct a focused survey of suitable habitat within the treatment area. If potentially suitable aquatic habitat is present within a treatment area (e.g., creeks, streams, ponds, drainages), upland habitat within approximately 1,500 feet of this aquatic habitat will also be surveyed. The qualified biologist will inspect the treatment area for western pond turtles as well as suitable burrow habitat. ▸ If western pond turtles are not detected during the focused survey, then further mitigation is not required. ▸ If western pond turtles are detected, a no-disturbance buffer of at least 100 feet will be established around any identified nest sites or overwintering sites. A qualified biologist with an appropriate CDFW Scientific Collecting Permit that allows handling of reptiles will be present during treatment activities and will inspect the treatment area before initiation of treatment activities. If western pond turtles are detected, the qualified biologist will move the turtles downstream and out of harm's way.			
Mitigation Measure BIO-2e: Conduct Protocol-level Surveys for Burrowing Owl, Implement Avoidance Measures, and Compensate for Loss of Occupied Burrows If it is determined that suitable habitat for burrowing owl is present within a treatment area (e.g., through implementation of Mitigation Measure BIO-1a), the following measures will be implemented during the planning stages of a treatment project under the WVFMP: ▸ A qualified biologist with familiarity of burrowing owl life history and survey protocols will conduct a burrowing owl habitat assessment in accordance with Appendix C of the CDFW Staff Report on Burrowing Owl Mitigation (CDFW 2012, or most current version) (CDFW Staff Report). ▸ If the treatment area does not contain suitable burrowing owl habitat (e.g., ruderal grassland, successional grassland, scrub habitat with sparse shrub cover, mammal burrows or burrow surrogates, friable soil), as determined by the qualified biologist, then further mitigation for burrowing owl is not required. ▸ If the qualified biologist determines that suitable burrowing owl habitat is present within the treatment area, then the qualified biologist will conduct focused breeding and nonbreeding season surveys for burrowing owls in areas of suitable habitat identified during the habitat assessment or reconnaissance-level survey (e.g., ruderal grassland, successional grassland, scrub habitat with sparse shrub cover) on and within 1,500 feet of the treatment area. Surveys will be conducted before the start of treatment activities and in accordance with Appendix D of the CDFW Staff Report. ▸ If no occupied burrows are found, the qualified biologist will submit a letter report documenting the survey methods and results to UC Berkeley and no further mitigation will be required.	Prior to and during treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
▸ If an active burrow is found within 1,500 feet of a treatment area and treatment activities would occur during the nonbreeding season (September 1 through January 31), UC Berkeley will consult with CDFW during treatments. If occupied burrows are present that cannot be avoided or adequately protected with a no-disturbance buffer, a burrowing owl exclusion plan will be developed, as described in Appendix E of the CDFW Staff Report. Burrowing owls will not be excluded from occupied burrows until the project's burrowing owl exclusion plan is approved by CDFW. The exclusion plan will include a plan for creation, maintenance, and monitoring of artificial burrows in suitable habitat. ▸ If an active burrow is found during the breeding season (February 1 through August 31), occupied burrows will not be disturbed and will be provided with a protective buffer unless a qualified biologist verifies through noninvasive means that either: (1) the birds have not begun egg laying, or (2) juveniles from the occupied burrows are foraging independently and are capable of independent survival. The size of the buffer will depend on the time of year and level of disturbance as outlined in the CDFW Staff Report. The size of the buffer may be reduced if a broad-scale, long-term, monitoring program acceptable to CDFW is implemented so that burrowing owls are not adversely affected. Once the fledglings are capable of independent survival, the owls can be evicted and the burrow can be destroyed per the terms of a CDFW-approved burrowing owl exclusion plan developed in accordance with Appendix E of CDFW Staff Report. ▸ If active burrowing owl nests are found within a treatment area and are destroyed by implementation of treatment activities, UC Berkeley will mitigate the loss of occupied habitat in accordance with guidance provided in the CDFW Staff Report, which states that permanent impacts on nesting, occupied and satellite burrows, and burrowing owl habitat will be mitigated such that habitat acreage and number of burrows are replaced through permanent conservation of comparable or better habitat with similar vegetation communities and burrowing mammals (e.g., ground squirrels) present to provide for nesting, foraging, wintering, and dispersal. UC Berkeley will retain a qualified biologist to develop a burrowing owl mitigation and management plan that incorporates the following goals and standards: ▪ Mitigation lands will be selected based on comparison of the habitat lost to the compensatory habitat, including type and structure of habitat, disturbance levels, potential for conflicts with humans, pets, and other wildlife, density of burrowing owls, and relative importance of the habitat to the species range wide. ▪ If feasible, mitigation lands will be provided adjacent or proximate to the project site so that displaced owls can relocate with reduced risk of injury or mortality. Feasibility of providing mitigation adjacent or proximate to the project site depends on availability of sufficient suitable habitat to support displaced owls that may be preserved in perpetuity.			

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
▪ If suitable habitat is not available for conservation adjacent or proximate to the project site, mitigation lands will be focused on consolidating and enlarging conservation areas outside of urban and planned growth areas and within foraging distance of other conservation lands. Mitigation may be accomplished through purchase of mitigation credits at a CDFW-approved mitigation bank, if available. If mitigation credits are not available from an approved bank and mitigation lands are not available adjacent to other conservation lands, alternative mitigation sites and acreage will be determined in consultation with CDFW. ▪ If mitigation is not available through an approved mitigation bank and will be completed through permittee-responsible conservation lands, the mitigation plan will include mitigation objectives, site selection factors, site management roles and responsibilities, vegetation management goals, financial assurances and funding mechanisms, performance standards and success criteria, monitoring and reporting protocols, and adaptive management measures. Success will be based on the number of adult burrowing owls and pairs using the site and if the numbers are maintained over time. Measures of success, as suggested in the CDFW Staff Report, will include site tenacity, number of adult owls present and reproducing, colonization by burrowing owls from elsewhere, changes in distribution, and trends in stressors.			
Mitigation Measure BIO-2f: Conduct Focused Surveys for Nesting Raptors and Other Native Nesting Birds and Implement Protective Buffers If it is determined that suitable habitat for nesting raptors or other native nesting birds, including special-status species (i.e., white-tailed kite, northern harrier, yellow warbler) is present within a treatment area (e.g., through implementation of Mitigation Measure BIO-1a), the following measures will be implemented: ▸ To minimize the potential for loss of nesting raptors and other birds, treatment activities will be conducted during the nonbreeding season (approximately September 1-January 31, as determined by a qualified biologist), if feasible. If treatment activities are conducted during the nonbreeding season, no further mitigation will be required. ▸ Within 14 days before the onset of treatment activities during the breeding season (approximately February 1 through August 31, as determined by a qualified biologist), a qualified biologist familiar with birds of California and with experience conducting nesting bird surveys will conduct focused surveys for white-tailed kites, northern harrier, other nesting raptors and other native birds and will identify active nests within 500 feet of the site. ▸ Because the nests of yellow warbler are small and difficult to find, occupancy of suitable habitat (i.e., riparian woodland) for this species will be determined by a qualified biologist familiar with the life history of yellow warbler and with experience identifying the calls of yellow warbler. If yellow warblers are observed calling, exhibiting territorial displays, carrying nest materials, carrying prey, or other signs of breeding behavior, the habitat will be considered occupied.	Prior to, during, and following treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
▸ Impacts on nesting birds will be avoided by establishing appropriate buffers around active nest sites identified during focused surveys to prevent disturbance to the nest. Activity will not commence within the buffer areas until a qualified biologist has determined that the young have fledged, the nest is no longer active, or reducing the buffer will not likely result in nest abandonment. An avoidance buffer of 0.25 mile will be implemented for white-tailed kite, in consultation with CDFW. For other species, a qualified biologist will determine the size of the buffer for non-raptor nests after a site- and nest-specific analysis. Buffers typically will be 500 feet for raptors (other than white-tailed kite) and 100 feet for non-raptor species. Factors to be considered for determining buffer size will include presence of natural buffers provided by vegetation or topography, nest height above ground, baseline levels of noise and human activity, species sensitivity, and expected treatment activities. The size of the buffer may be adjusted if a qualified biologist determines that such an adjustment would not be likely to adversely affect the nest. Any buffer reduction for a special-status species (i.e., white-tailed kite, northern harrier, yellow warbler) from the typical size (i.e., 0.25 mile, 500 feet, 100 feet, respectively) will require consultation with CDFW. Periodic monitoring of the nest by a qualified biologist during and after treatment activities will be required if the activity has potential to adversely affect the nest, the buffer has been reduced, or if birds within active nests are showing behavioral signs of agitation (e.g., standing up from a brooding position, flying off the nest) during treatment activities, as determined by the qualified biologist. ▸ Removal of golden eagle nests is prohibited regardless of the occupancy status under the federal Bald and Golden Eagle Protection Act. If golden eagle nests are found during focused surveys, then the nest tree shall not be removed.			
Mitigation Measure BIO-2g: Conduct Focused Surveys for Monarch Overwintering Colonies and Implement Avoidance Measures If it is determined that a monarch overwintering colony or suitable overwintering habitat is present within a treatment area (e.g., through implementation of Mitigation Measure BIO-1a), the following measures will be implemented: ▸ To minimize the potential for loss of monarch overwintering colonies, treatment activities within suitable overwintering habitat (e.g., coniferous forest, eucalyptus forest) will be conducted from April through September to avoid the overwintering season (October through March), if feasible. If treatment activities are conducted outside of the overwintering season, no further mitigation will be required. ▸ Within 14 days before the onset of treatment activities between October 1st and March 31st, a qualified biologist familiar with monarchs and monarch overwintering habitat will conduct focused surveys for monarch colonies within suitable habitat in the treatment area and will identify any colonies found within the treatment area.	Prior to and during treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
▸ Monarch overwintering colonies that are identified within a treatment area will be demarcated with flagging or high-visibility construction fencing to prevent removal of the stand of trees containing the overwintering colony and encroachment by heavy machinery, vehicles, or personnel. Removal of the tree or stand of trees that contains the overwintering colony will not occur until the monarchs have left the area, as determined by a qualified biologist. ▸ If modification or removal of a stand that contains an identified overwintering colony is required to meet treatment objectives and cannot be delayed, UC Berkeley will prepare and implement a site-specific treatment plan for the stand with the goal of maintaining habitat function for the monarch overwintering colony, following feasible recommendations from *Protecting California's Butterfly Groves Management Guidelines for Monarch Butterfly Overwintering Habitat* (Xerces 2017). Examples of management strategies that could be considered to maintain habitat function include: ▪ remove or trim hazard trees; ▪ selectively remove or trim of trees to create a heterogeneous habitat that provides access to sunlight and shade for monarchs; ▪ maintain suitable wind protection in the stand; and ▪ replace removed trees with native trees in strategic locations to provide additional wind protection.			
Mitigation Measure BIO-2h: Conduct Focused American Badger Survey and Establish Protective Buffers If it is determined that suitable habitat for American badger is present within a treatment area (e.g., through implementation of Mitigation Measure BIO-1a), the following measures will be implemented for treatment projects under the WVFMP: ▸ Within 30 days before commencement of treatment activities, a qualified wildlife biologist with familiarity with American badger and experience using survey methods for the species will conduct focused surveys of suitable habitat within the treatment area to identify any American badger burrows or dens. ▸ If occupied burrows are not found, further mitigation is not required. If occupied burrows are found, impacts on active badger dens will be avoided by establishing exclusion zones around all active badger dens, the size of which will be determined by the qualified biologist. No treatment activities will occur within the exclusion zone until denning activities are complete or the den is abandoned, as confirmed by a qualified biologist. The qualified biologist will monitor each den once per week to track the status of the den and to determine when it is no longer occupied. When it is no longer occupied, treatment activities within the exclusion zone may occur.	Prior to and during treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
Mitigation Measure BIO-2i: Conduct Focused Noninvasive Surveys for Mountain Lion Dens and Implement Avoidance Measures If it is determined that potentially suitable den habitat (e.g., caves, other large natural cavities, thickets) for mountain lion is present within a treatment area (e.g., through implementation of Mitigation Measure BIO-1a) or signs of mountain lion activities are observed (e.g., tracks, scat, carcasses or bones of prey species), the following measures will be implemented for treatment projects under the WVFMP: ▸ Within 7 days before commencement of treatment activities, a qualified wildlife biologist with familiarity with mountain lion and experience using survey methods for the species will conduct focused surveys of suitable habitat within the treatment area to identify any potential mountain lion nurseries. Potential mountain lion dens include caves, large natural cavities within rocky areas, or thickets deemed appropriate for use by mountain lions based on size and other characteristics (e.g., proximity to human development, surrounding habitat). The qualified wildlife biologist will also survey for signs of mountain lion (e.g., tracks, scat, carcasses or bones of prey species) in the vicinity of potential nursery habitat to help determine whether the area may contain a mountain lion nursery. ▸ If signs of a nursery are found during surveys (or during other biological monitoring, when occurring), further investigation will be required to determine if a mountain lion nursery is present. No treatment will occur in the area while further investigation is occurring. Survey methods will include the use of trail cameras, track plates, hair snares, and/or other noninvasive methods, as well as coordination with local experts tracking the species (if available). Surveys using these noninvasive methods will be conducted for three days and three nights to determine whether a nursery may be present. ▪ If a potential den site is determined to be unoccupied by mountain lion, no further mitigation is required. However, dens occupied by another carnivore species will not be disturbed or destroyed while any young are dependent on the den (in compliance with California Fish and Game Code sections on furbearers). ▪ If a nursery is discovered or further signs of a nursery are detected (e.g., lactating adult females or kittens on camera, repeated detections of an adult female in the area, growls or calls from kittens), UC Berkeley will implement a no-disturbance buffer of at least 2,000 feet (Wilmers et al. 2013) around the nursery or signs of a nursery for a minimum of 10 weeks. Treatment activities will not occur within this buffer during this time to avoid disturbance, injury, or mortality of mountain lion nurseries. ▪ UC Berkeley may consult with CDFW for technical information regarding other measures to avoid disturbance, injury, or mortality.	Prior to treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
Mitigation Measure BIO-2j: Conduct Focused Surveys for San Francisco Dusky-Footed Woodrat; Implement Avoidance Measures, or Relocate Nests If it is determined that suitable habitat (e.g., woodland, forest, scrub) for San Francisco dusky-footed woodrat is present within a treatment area (e.g., through implementation of Mitigation Measure BIO-1a), the following measures will be implemented for treatment projects under the WVFMP: ▸ Within seven days before initiation of treatment activities, a qualified biologist with familiarity with woodrats and experience conducting woodrat surveys will conduct a focused survey for San Francisco dusky-footed woodrat nests within the treatment area, within all associated access roads and staging areas, and within a sufficient buffer surrounding these areas where indirect disturbance could occur, as determined by the qualified biologist. ▸ If no woodrat nests are found during the focused survey, the qualified biologist will submit a letter report summarizing the results of the survey to UC Berkeley, and no further mitigation would be required. ▸ If woodrat nests are detected within the treatment area, the qualified biologist will determine whether the nest is active; this is typically determined through the presence of large amounts of scat. If active woodrat nests are present that can be avoided, the perimeter of these nests will be demarcated with high-visibility construction fencing to prevent accidental encroachment by vehicles, equipment, or personnel. ▸ If active woodrat nests within a treatment area are detected that cannot be avoided, and treatment activities are planned to occur during the woodrat breeding season (April through June), these active nests must be avoided until the end of the breeding season. ▸ If active woodrat nests within a treatment area cannot be avoided, and treatment activities are planned to occur outside of the woodrat breeding season, a CDFW-approved qualified biologist will dismantle the woodrat nest by hand, removing the materials layer by layer to allow adult woodrats to escape. If young are discovered during the disassembling process, the qualified biologist will leave the area for at least 24 hours to allow the adult woodrats to relocate their young on their own. ▸ When the disassembly process is completed, the nest materials will be collected and moved to another suitable nearby location to allow for nest reconstruction.	Prior to treatments (for all treatment activities)	UC Berkeley	UC Berkeley
Mitigation Measure BIO-2k: Conduct Focused Bat Surveys and Implement Avoidance Measures If it is determined that suitable roost habitat (e.g., woodland, forest, scrub) for pallid bat, Townsend's big-eared bat, or western red bat is present within a treatment area (e.g., through implementation of Mitigation Measure BIO-1a), the following measures will be implemented for treatment projects under the WVFMP:	Prior to treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
▸ In the early planning stages of treatment projects, a qualified biologist with familiarity with bats and bat ecology, and experience conducting bat surveys will conduct surveys for bat roosts in suitable habitat (e.g., large trees, crevices, cavities, exfoliating bark, bridges, unoccupied buildings) within and adjacent to a treatment area. ▸ If no evidence of bat roosts is found, then no further study will be required. ▸ If evidence of bat roosts is observed, the species and number of bats using the roost will be determined. Bat detectors may be used to supplement survey efforts. A no-disturbance buffer of 250 feet will be established around active pallid bat, Townsend's big-eared bat, or western red bat roosts, and mechanical and manual treatments will not occur within this buffer. Prescribed broadcast burning activities and pile burning within this buffer will be implemented outside of the bat breeding season, which is April 1–August 31.			
Mitigation Measure BIO-3a: Conduct Protocol-Level Surveys for Sensitive Natural Communities and Riparian Habitat and Implement Avoidance Measures If it is determined that sensitive natural communities or riparian habitat may be present within a treatment area (e.g., through implementation of Mitigation Measure BIO-1a), the following measures will be implemented before treatment: ▸ A qualified botanist will perform a protocol-level survey of the proposed treatment area for sensitive natural communities and sensitive habitats (including riparian habitat) following the CDFW's Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities (CDFW 2018). Sensitive natural communities will be identified using the best available and current data, including keying them out using the most current edition of A Manual of California Vegetation (including updated natural communities data at http://vegetation.cnps.org/), or referring to relevant reports (e.g., reports found on the VegCAMP website). ▸ Before implementation of treatment activities, all sensitive habitats identified during surveys will be flagged or fenced with brightly visible construction flagging and/or fencing under the direction of the qualified biologist and no treatment activities will occur within these areas. Foot traffic by personnel shall also be limited in these areas to prevent the introduction of invasive or weedy species or inadvertent crushing of plants. Periodic inspections during construction shall be conducted by the monitoring biologist to maintain the integrity of exclusion fencing/flagging throughout the period of construction involving ground disturbance. If after implementation of Mitigation Measure BIO-3a sensitive natural communities or riparian habitat are determined to be present within a treatment area and cannot be avoided because the treatment objectives cannot be met if the sensitive natural community or riparian habitat is avoided, the following measures will be implemented:	Prior to and during treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
▸ A qualified botanist with knowledge of the affected sensitive natural community or riparian habitat will review the treatment design and applicable impact minimization measures (potentially including others not listed above) to determine if the implementation of the treatment is anticipated to result in a loss of habitat function (i.e., the location, essential habitat features, and species supported are not substantially changed) of the sensitive natural community or riparian habitat. Any loss of acreage of sensitive natural communities with a rarity rank of S1 or S2 would constitute a loss of habitat function. If a qualified botanist determines the habitat function will be maintained, such that the persistence and regeneration of the habitat would not be hindered, no further mitigation will be required. If a qualified botanist determines that the loss or degradation of sensitive natural communities or riparian habitat would result in loss of habitat function after implementing feasible treatment design modifications and impact minimization measures, then Mitigation Measure BIO-3b or Mitigation Measure BIO-3c will be implemented. ▸ The only exception to this mitigation approach is in cases where it is determined by a qualified botanist that the sensitive natural community or riparian habitat would benefit from treatment in the occupied area even though some loss may occur during treatment activities. For a treatment to be considered beneficial to a sensitive natural community or riparian habitat, the qualified botanist will demonstrate that habitat function is reasonably expected to improve with implementation of the treatment such that sensitive natural community or riparian habitat would expand, regenerate, or display increased vigor after treatment implementation. Evidence supporting this conclusion could include citing scientific studies demonstrating that the community or similar community has benefitted from increased sunlight as a result of canopy opening, eradication of invasive species, or otherwise reduced competition for resources. This demonstration will be documented in a letter report to UC Berkeley. If it is determined that treatment activities would be beneficial to sensitive natural communities or riparian habitat, no compensatory mitigation will be required.			
Mitigation Measure BIO-3b: Compensate for Unavoidable Loss of Sensitive Natural Communities If after implementation of Mitigation Measure BIO-3a sensitive natural communities are determined to be present within a treatment area and loss of habitat function would occur as specified under Mitigation Measure BIO-3a, the following measures will be implemented for treatment projects under the WVFMP: ▸ Compensate for unavoidable loss of any sensitive natural community habitat function such that no net loss of habitat function occurs by: ▪ restoring sensitive natural community habitat function within the treatment area; ▪ restoring degraded sensitive natural communities outside of the treatment area at a sufficient ratio to offset the loss of habitat function; or	Prior to, during, and following treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
▪ preserving existing sensitive natural communities of equal or better value to the sensitive natural community affected through a conservation easement at a sufficient ratio to offset the loss of habitat function. ▸ UC Berkeley will prepare and implement a Compensatory Mitigation Plan that will include the following: ▪ For preserving existing habitat outside of the treatment area in perpetuity, the Compensatory Mitigation Plan will include a summary of the proposed compensation lands (e.g., the number and type of credits, location of mitigation bank or easement), parties responsible for the long-term management of the land, and the legal and funding mechanism for long-term conservation (e.g., holder of conservation easement or fee title). UC Berkeley will provide evidence in the plan that the necessary mitigation has been implemented or that UC Berkeley has entered into a legal agreement to implement it and that compensatory habitat will be preserved in perpetuity. ▪ For restoring or enhancing habitat within the treatment area or outside of the treatment area, the Compensatory Mitigation Plan will include a description of the proposed habitat improvements, success criteria that demonstrate the performance standard of maintained habitat function has been met, legal and funding mechanisms, and parties responsible for long-term management and monitoring of the restored or enhanced habitat. ▪ Success criteria required to maintain habitat function for preserved and compensatory populations would include: ▪ The extent of occupied area and density of plants associated with the sensitive natural community (number of plants per unit area) in compensatory habitats would be equal to or greater than the affected occupied habitat. ▪ Compensatory and preserved sensitive natural communities would be self-producing. Populations would be considered self-producing when: o Plants associated with sensitive natural communities reestablish annually for a minimum of five years with no human intervention such as supplemental seeding; and o Reestablished and preserved habitats contain an occupied area and density comparable to existing occupied habitat areas in similar habitat types in the treatment area vicinity.			
Mitigation Measure BIO-3c: Compensate for Unavoidable Loss of Riparian Habitat If after implementation of Mitigation Measure BIO-3a riparian habitat is determined to be present within a treatment area and loss of habitat function would occur as specified under Mitigation Measure BIO-3a, the following measures will be implemented for treatment projects under the WVFMP:	Prior to, during, and following treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
▶ UC Berkeley will compensate for unavoidable losses of riparian habitat function such that no net loss of habitat function occurs by: ▪ restoring riparian habitat function within the treatment area; ▪ restoring degraded riparian habitat outside of the treatment area; ▪ purchasing riparian habitat credits at a CDFW-approved mitigation bank; or ▪ preserving existing riparian habitat of equal or better value to the affected riparian habitat through a conservation easement at a sufficient ratio to offset the loss of riparian habitat function. ▶ UC Berkeley will prepare and implement a Compensatory Mitigation Plan that will include the following: ▪ For preserving existing riparian habitat outside of the treatment area in perpetuity, the Compensatory Mitigation Plan will include a summary of the proposed compensation lands (e.g., the number and type of credits, location of mitigation bank or easement), parties responsible for the long-term management of the land, and the legal and funding mechanism for long-term conservation (e.g., holder of conservation easement or fee title). UC Berkeley will provide evidence in the plan that the necessary mitigation has been implemented or that UC Berkeley has entered into a legal agreement to implement it and that compensatory plant populations will be preserved in perpetuity. ▪ For restoring or enhancing riparian habitat within the treatment area or outside of the treatment area, the Compensatory Mitigation Plan will include a description of the proposed habitat improvements, success criteria that demonstrate the performance standard of maintained habitat function has been met, legal and funding mechanisms, and parties responsible for long-term management and monitoring of the restored or enhanced habitat. ▪ Compensatory mitigation may be satisfied through compliance with permit conditions, or other authorizations obtained by UC Berkeley (e.g., Lake and Streambed Alteration Agreement), if these requirements are equally or more effective than the mitigation identified above.			
Mitigation Measure BIO-4a: Avoid State and Federally Protected Wetlands If it is determined that wetland habitat may be present within a treatment area (e.g., through implementation of Mitigation Measure BIO-1a), the following measures will be implemented before treatment: ▶ A qualified biologist will delineate the boundaries of state or federally protected wetlands within the treatment area according to methods established in the USACE wetlands delineation manual (Environmental Laboratory 1987) and the Arid West regional supplement (USACE 2008). ▶ A qualified biologist will delineate the boundaries of wetlands that may not meet the definition of waters of the United States, but would qualify as waters of the state, according to the state wetland procedures.	Prior to and during treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
▶ A qualified biologist will establish a buffer around wetlands and mark the buffer boundary with high-visibility flagging, fencing, stakes, or clear, existing landscape demarcations (e.g., edge of a roadway). The buffer will be a minimum width of 25 feet but may be larger if deemed necessary. The appropriate size and shape of the buffer zone will be determined in coordination with the qualified biologist and will depend on the type of wetland present (e.g., seasonal wetland, wet meadow, freshwater marsh, vernal pool), the timing of treatment (e.g., wet or dry time of year), whether any special-status species may occupy the wetland and the species' vulnerability to the treatment activities, environmental conditions and terrain, and the treatment activity being implemented. ▶ A qualified biologist will periodically inspect the materials demarcating the buffer to confirm that they are intact and visible, and wetland impacts are being avoided. ▶ Within this buffer, herbicide application is prohibited. ▶ Within this buffer, any ground disturbance is prohibited. Accordingly, the following activities are not allowed within the buffer zone: mechanical treatments, managed herbivory, and vehicle access or staging. ▶ Only prescribed burning may be implemented in wetland habitats if it is determined by a qualified biologist that: ▪ No special-status species are present in the wetland habitat. ▪ The wetland functions would be maintained. ▪ The prescribed broadcast burn is within the normal fire return interval for the wetland vegetation types present. ▪ Fire containment lines and pile burning are prohibited within the buffer. ▪ No fire ignition (and associated use of accelerants) will occur within the wetland buffer.			
Mitigation Measure BIO-5a: Install Wildlife-Friendly Fencing for Managed Herbivory Treatments If temporary fencing is required for managed herbivory treatment, a wildlife-friendly fencing design will be used. UC Berkeley will require a qualified biologist to review and approve the design before installation to minimize the risk of wildlife entanglement. The fencing design will meet the following standards: ▶ Minimize the chance of wildlife entanglement by avoiding barbed wire, loose or broken wires, or any material that could impale or snag a leaping animal; and, if feasible, keeping electric netting-type fencing electrified at all times or laid down while not in use. ▶ Charge temporary electric fencing with intermittent pulse energizers. Continuous output fence chargers will not be permitted. ▶ Allow wildlife to jump over easily without injury by installing fencing that can flex as animals pass over it and installing the top wire low enough (no more than approximately 40 inches high	Prior to managed herbivory treatments	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
on flat ground) to allow adult deer to jump over it. The determination of appropriate fence height will consider slope, as steep slopes are more difficult for wildlife to pass. ▸ Be highly visible to birds and mammals by using high-visibility tape or wire, flagging, or other markers.			
Mitigation Measure BIO-5b: Retain Nursery Habitat and Implement Buffers to Avoid Nursery Sites If it is determined that wildlife nursery sites are present within a treatment area (e.g., through implementation of Mitigation Measure BIO-1a), the following measures will be implemented before implementation of treatment activities. In addition, if more than one year between completion of the data review and reconnaissance survey from Mitigation Measure BIO-1a has occurred, the data review and reconnaissance survey will be updated to determine if wildlife nursery sites are present within a treatment area: ▸ **Retain Known Nursery Sites.** A qualified biologist will identify the important habitat features of the wildlife nursery and, prior to treatment activities, will mark these features for avoidance and retention during treatment to maintain the function of nursery habitat. ▸ **Establish Avoidance Buffers.** UC Berkeley will establish a no-disturbance buffer around the nursery site if activities are required while the nursery site is active/occupied. The appropriate size and shape of the buffer will be determined by a qualified biologist, based on potential effects of treatment project-related habitat disturbance, noise, visual disturbance, and other factors. No treatment activity will commence within the buffer area until a qualified biologist confirms that the nursery site is no longer active/occupied. Monitoring of the effectiveness of the no-disturbance buffer around the nursery site by a qualified biologist during and after treatment activities will be required. If treatment activities cause agitated behavior of the individual(s), the buffer distance will be increased, or treatment activities modified until the agitated behavior stops. The qualified biologist will have the authority to stop any treatment activities that could result in potential adverse effects to wildlife nursery sites.	Prior to, during, and following treatments (for all treatment activities)	UC Berkeley	UC Berkeley
Hydrology and Water Quality Mitigation Measures			
Mitigation Measure HYD-1: Establish Watercourse Protection Buffers UC Berkeley will establish watercourse protection buffers (WPBs) as defined below on either side of watercourses within the Plan Area. The buffer system described below is similar to the Watercourse and Lake Protection Zone classification defined in 14 CCR Section 916.5, but has been tailored to local conditions in the Plan Area and specifics of the WVFMP. WPBs will be classified based on the uses of the stream and the presence of aquatic life. Wider WPBs are required for steep slopes. The table below provides a summary of procedures for determining WPB widths. ▸ The following WPB protections will be applied for all treatments: ▪ To protect water temperature, filter strip properties, upslope stability, and fish and wildlife values, the following vegetation retention guidelines will be implemented within WBPs: ▪ Class 1 and 2 watercourses: At least 50 percent of the overstory and 50 percent of the understory canopy covering the ground and adjacent waters will be left in a well	During and following treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
distributed multi-storied stand composed of a diversity of species similar to that found before the start of operations. ▪ Class 3 watercourses: At least 50 percent of the total canopy covering the ground will be left in a well distributed multi-storied stand configuration composed of a diversity of species similar to that found before the start of operations. At least 75 percent surface cover and undisturbed area will be retained. ▪ Equipment, including tractors and vehicles, will not be driven in wet areas or WPBs, except over existing roads or watercourse crossings where vehicle tires or tracks remain dry. ▪ Equipment used in vegetation removal operations will not be serviced in WPBs or other wet areas, or in locations that would allow grease, oil, or fuel to pass into lakes, watercourses, or wet areas. ▪ WPBs will be kept free of slash, debris, and other material, including burn piles, that could degrade water quality. Accidental deposits will be removed immediately. ▪ No fire ignition will occur within WPBs; however, low intensity backing fires may be allowed to enter or spread into WPBs. ▪ Large areas of bare soil within WPBs that are exposed by treatment activities will be stabilized with mulching, grass seeding, or soil stabilizers before the beginning of the rainy season (October 15).			
Noise and Vibration Mitigation Measures			
Mitigation Measure NOI-1: Notify Residential and Academic Land Uses At least three days prior to beginning treatment activities or biomass disposal activities using chainsaws, mechanical equipment, or water tenders, UC Berkeley will provide advanced notice to occupants of residential land uses in the City of Berkeley that are within 215 feet of such activity and occupants of residential land uses in the City of Oakland that are within 135 feet of such treatment activity. At 215 feet noise generated by chainsaws (i.e., the loudest piece of equipment) would attenuate to less than 75 dB L_{eq}, which is the City of Berkeley's noise standard for nonscheduled, intermittent, short-term operation of mobile equipment. At 135 feet noise generated by chainsaws (i.e., the loudest piece of equipment) would attenuate to less than 80 dB Leq, which is the City of Oakland's noise standard for construction-generated noise. Because the distance used for notification is based on the distance required to reduce the noise levels associated with the loudest piece of equipment to below local standards, it would be sufficient to also reduce noise levels associated with the lower volume activities and equipment. Additionally, UC facilities and academic land uses within these noise contours will be notified. Notification will include the dates and hours during which excessive noise generating activities are anticipated to occur and contact information, including a daytime telephone number, of a project representative. Recommendations to assist noise-sensitive land uses in reducing interior noise levels (e.g., closing windows and doors) will also be included in the notification.	Prior to biomass disposal and treatment activities using chainsaws, mechanical equipment, and/or water tenders	UC Berkeley	UC Berkeley

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Appendix B2

Mitigation Monitoring and Reporting Program: Identified Treatment Projects

MITIGATION MONITORING AND REPORTING PROGRAM: IDENTIFIED TREATMENT PROJECTS

INTRODUCTION

The California Environmental Quality Act (CEQA) (Public Resources Code [PRC] Section 21081.6) and the State CEQA Guidelines (State CEQA Guidelines Sections 15091[d] and 15097) require public agencies to adopt a program for reporting on or monitoring the changes which it has either required in the project or made a condition of approval to avoid or substantially lessen significant environmental effects. A Mitigation Monitoring and Reporting Program (MMRP) is required for approval of the proposed Wildland Vegetative Fuel Management Plan (WVFMP or Plan) for the University of California, Berkeley (UC Berkeley) Hill Campus (Plan Area or Hill Campus), because the environmental impact report (EIR) identifies potential significant adverse impacts, for which all feasible mitigation measures have been adopted. Environmental protection measures (EPMs), which are part of the Plan, have been integrated into treatment design to avoid or minimize adverse effects. Where potentially significant impacts remain after application of EPMs, mitigation measures have been identified to further reduce and/or compensate for those impacts. While only mitigation measures are required to be included in an MMRP, both EPMs and mitigation measures are included in the WVFMP MMRP to assist in implementation of all measures for later activities consistent with the WVFMP.

The EIR presents a program-level analysis for the overall WVFMP and a project-level analysis for the Identified Treatment Projects. Accordingly, there are two separate MMRPs; a MMRP for the overall WVFMP (refer to Appendix B1) and this MMRP for the Identified Treatment Projects. The program-level MMRP includes all of the EPMs and mitigation measures that apply to implementation of the overall WVFMP. This project-level MMRP includes only those EPMs and mitigation measures that apply specifically to the Identified Treatment Projects.

PURPOSE OF MITIGATION MONITORING AND REPORTING PROGRAM

This MMRP has been prepared to monitor the implementation of EPMs and mitigation measures in connection with the approval of the WVFMP and its use by the university. The attached table presents the text of each EPM and mitigation measure, the timing of its planned implementation, the implementing entity, and the entity with monitoring responsibility. The numbering of EPMs and mitigation measures follows the numbering used in the EIR. EPMs and mitigation measures that are referenced more than once in the EIR are not duplicated in the MMRP.

ROLES AND RESPONSIBILITIES

The UC Regents is the lead agency with authority to adopt the MMRP. The UC Regents, in coordination with UC Berkeley, will prepare project-specific MMRPs in connection with the Environmental Checklist and approval of later activities, as described above.

Unless otherwise specified herein, the university is responsible for taking all actions necessary to implement the mitigation measures under its jurisdiction according to the specifications provided for each measure and for demonstrating that the action has been successfully completed. The university will be responsible for implementation of mitigation measures pursuant to Section 15097 of the State CEQA Guidelines.

The university is responsible for overall administration of the MMRP and for verifying that staff members or contractors have completed the necessary actions for each measure (i.e., appropriate amendments to the proposed ordinance).

REPORTING

The university will document and describe the compliance of a later treatment project with the required EPMs and mitigation measures either by adapting the project-specific MMRP table or preparing a separate post-project implementation report.

MITIGATION MONITORING AND REPORTING PROGRAM TABLE

The categories identified in the attached MMRP table are described below.

- EPMs and Mitigation Measures – This column provides the verbatim text of the applicable EPM or adopted mitigation measure.
- Timing – This column identifies the time frame in which the EPM or mitigation measure will be implemented and to which treatment activities the EPM or mitigation measure would apply (i.e., manual, mechanical, and/or herbicide application).
- Implementing Entity – This column identifies the party responsible for implementing the EPM or mitigation measure.
- Verifying/Monitoring Entity – This column identifies the party responsible for verifying and monitoring implementation of the EPM or mitigation measure.

Mitigation Monitoring and Reporting Program: Identified Treatment Projects

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
ENVIRONMENTAL PROTECTION MEASURES (EPMs)			
Administrative Environmental Protection Measures			
EPM AD-1 Maintain Site Cleanliness: If trash receptacles are used at treatment sites, UC Berkeley will use fully covered trash receptacles with secure lids (wildlife proof) to contain all food, food scraps, food wrappers, beverages, and other worker generated miscellaneous trash. UC Berkeley will remove all temporary non-biodegradable flagging, trash, debris, and barriers from treatment sites upon completion of project activities.	During and following treatments (for all treatment activities)	UC Berkeley	UC Berkeley
EPM AD-2 Public Notifications of Road and Recreation Area Closures: At least one week before disruption or closure of a public roadway or fire trail, UC Berkeley will update its Facilities Services website with project information and install digital signage at multiple strategic roadway locations notifying the public of project schedules, road closures, and alternative routing.	Prior to treatments (for all treatment activities)	UC Berkeley	UC Berkeley
Aesthetic and Visual Resource Environmental Protection Measures			
EPM AES-1 Avoid Staging within Viewsheds: UC Berkeley will store all treatment-related materials, including vehicles, vegetation treatment debris, and equipment, outside of the viewshed of public trails and roadways to the extent feasible. UC Berkeley will also locate materials staging and storage areas where they will minimize or avoid visual impacts.	Prior to, during, and following treatments (for all treatment activities)	UC Berkeley	UC Berkeley
Archaeological, Historical, and Tribal Cultural Resource Environmental Protection Measures			
EPM CUL-1 Environmental Awareness Training: A qualified archaeologist and/or Native American representative will provide Environmental Awareness Training to all staff, including supervisors, involved with vegetation treatment activities before initiation of a treatment. Training materials will be provided to any new staff over the course of a treatment project. Upon completion of the training, staff will sign a form stating that they attended the training and understand and will comply with the information presented. The training will cover the cultural history of the area; relevant information regarding known archaeological resources; actions to take for the inadvertent discovery of cultural resources, including whom to contact if any potential archaeological resources or artifacts are encountered; applicable laws; and avoidance and minimization measures to be implemented. The training will also underscore the requirement for confidentiality and culturally-appropriate treatment of any discovery of significance to Native Americans and behaviors consistent with Native American Tribal values.	Prior to treatments (for all treatment activities)	UC Berkeley	UC Berkeley
Air Quality Environmental Protection Measures			
EPM AQ-2 Minimize Air Emissions: UC Berkeley will implement applicable BAAQMD measures (BAAQMD 2017) to minimize air quality emissions, as appropriate, including the following:	Prior to, during, and following treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
ENVIRONMENTAL PROTECTION MEASURES (EPMs)			
▸ All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) will be watered two times per day. ▸ All haul trucks transporting soil, sand, or other loose material off-site will be covered. ▸ All visible mud or dirt track-out onto adjacent public roads will be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited. ▸ All vehicle speeds on unpaved roads will be limited to 15 mph. ▸ Idling times will be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage will be provided for construction workers at all access points. ▸ All construction equipment will be maintained and properly tuned in accordance with manufacturer's specifications. All equipment will be checked by a certified visible emissions evaluator. ▸ Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person will respond and take corrective action within 48 hours. The Air District's phone number will also be visible to ensure compliance with applicable regulations.			
Biological Resource Environmental Protection Measures			
EPM BIO-1 Material Storage: All material stockpiling and staging areas will be located within designated landings that are outside of sensitive habitats.	During treatments (for all treatment activities)	UC Berkeley	UC Berkeley
EPM BIO-2 Avoid Spread or Introduction of Exotic Plants: The spread or introduction of exotic plant species will be avoided by minimizing soil disturbance to areas during and following treatments. Only native plant seeds or stock will be used for erosion control, as needed. 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 treatment areas.	During and following treatments (for all treatment activities)	UC Berkeley	UC Berkeley
EPM BIO-3 Let Wildlife Leave Area Unharmed: If any wildlife is encountered during treatment activities, the animal will be allowed to leave the treatment area unharmed and on its own accord.	During treatments (for all treatment activities)	UC Berkeley	UC Berkeley
EPM BIO-4 Environmental Awareness Training: A qualified biologist will provide Environmental Awareness Training to all staff involved with vegetation treatment activities before initiation of a treatment. Training materials will be provided to any new staff over the course of a treatment project. Upon completion of the training, staff will sign a form stating that they attended the training and understand and will comply with the information presented. The training will describe	Prior to treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
ENVIRONMENTAL PROTECTION MEASURES (EPMs)			
the appropriate work practices necessary to effectively implement the EPMs and mitigation measures and to comply with the state and federal Endangered Species Acts and will include the identification and relevant life history information of sensitive biological resources (e.g., wildlife, plants, habitats) that may potentially occur within the Plan Area.			
EPM BIO-5 Delineate Project Areas: UC Berkeley will clearly delineate project areas and restrict access to work crews outside of that area to prevent impacts to adjacent sensitive biological resources.	Prior to treatments (for all treatment activities)	UC Berkeley	UC Berkeley
EPM BIO-6 Access Plan to Minimize Ground Disturbance: UC Berkeley will use existing roads, trails, and former logging paths and minimize ground disturbance from equipment and vehicles (e.g., wheels, tracks, skidding to landings), to the extent feasible. UC Berkeley will develop an access/implementation plan that maps and names all fire roads and/or trails that will be used to reach treatment areas and that details the starting location(s) and direction of progression of treatment in coordination with a qualified biologist.	Prior to and during treatments (for all treatment activities)	UC Berkeley	UC Berkeley
Geology, Soils, and Mineral Resource Environmental Protection Measures			
EPM GEO-1 Suspend Disturbance During and After Precipitation: Ground-disturbing activities will not occur when soils are saturated as defined in 14 CCR 895.1, or within one week following an inch or more of rain, unless the ground is consistently firm and can support the weight of machinery or livestock (during managed herbivory) without creating ruts.	During treatments (for all treatment activities)	UC Berkeley	UC Berkeley
EPM GEO-2: Stabilize Disturbed Soil Areas: Bare soil will not be exposed in over 50 percent of the site, and no single bare patch will be larger than 15 square feet. UC Berkeley will stabilize newly created bare soil with mulch or equivalent, to minimize the potential for erosion and sediment discharge. In these areas, mulch/chip depth will be 3-6 inches over at least 90 percent of the exposed area, and will be placed as soon as possible after treatment activities and before October 15.	During and following treatments (for all treatment activities)	UC Berkeley	UC Berkeley
EPM GEO-3 Minimize Erosion: To minimize erosion, UC Berkeley will prohibit heavy equipment use where slopes are steeper than 30 percent. During managed herbivory, grazing animals will be removed from an area if accelerated soil erosion is observed.	During treatments utilizing heavy equipment and managed herbivory	UC Berkeley	UC Berkeley
EPM GEO-4 Drain Stormwater via Water Breaks: UC Berkeley will drain compacted and/or bare linear treatment areas capable of generating storm runoff via water breaks using the spacing and erosion control guidelines contained in Sections 914.6, 934.6, and 954.6(c) of the California Forest Practice Rules (2020). Where water breaks cannot effectively disperse surface runoff, including where water breaks cause surface runoff to be concentrated on downslopes, other erosion controls will be installed as needed to eliminate the concentration of runoff, such as application of mulch or installation of check dams. Water bars and rolling dips will be monitored and maintained for at least three years following the first winter of installation to ensure they are functioning properly.	During and following treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
ENVIRONMENTAL PROTECTION MEASURES (EPMs)			
EPM GEO-5 Steep Slopes: UC Berkeley will require a Registered Professional Forester (RPF) or licensed geologist to evaluate treatment areas with slopes greater than 50 percent for unstable areas (areas with potential for landslide) and unstable soils (soil with moderate to high erosion hazard). If unstable areas or soils are identified within the treatment area, are unavoidable, and will be potentially directly or indirectly affected by a treatment, a licensed geologist (P.G. or C.E.G.) will determine the potential for landslide, erosion, of other issues related to unstable soils and identity measures that will be implemented by UC Berkeley such that substantial erosion or loss of topsoil will not occur.	Prior to treatments (for all treatment activities)	UC Berkeley	UC Berkeley
Hazards and Hazardous Materials Environmental Protection Measures			
EPM HAZ-1 Maintain All Equipment: UCB will maintain all diesel- and gasoline-powered equipment per manufacturer's specifications and in compliance with all state and federal emissions requirements, as well as all equipment used for herbicide application. Maintenance records will be available for verification. Before the start of treatment activities, UC Berkeley will inspect all equipment for leaks and inspect everyday thereafter until equipment is removed from a treatment site. Any equipment found leaking will be promptly removed.	Prior to and during mechanical treatments, manual treatments utilizing machinery, and herbicide treatments	UC Berkeley	UC Berkeley
EPM HAZ-2 Spill Prevention and Response Plan: UC Berkeley or the licensed Pesticide Control Advisor (PCA) will prepare a Spill Prevention and Response Plan (SPRP) before beginning any herbicide treatment activities to provide protection to onsite workers, the public, and the environment from accidental leaks or spills of herbicides, adjuvants, or other potential contaminants. The SPRP will include (but not be limited to): ▸ a map that delineates staging areas, and storage, loading, and mixing areas for herbicides; ▸ a list of items required in an onsite spill kit that will be maintained throughout the life of the activity; and ▸ procedures for the proper storage, use, and disposal of any herbicides, adjuvants, or other chemicals used in vegetation treatment.	Prior to herbicide treatments	UC Berkeley	UC Berkeley
EPM HAZ-3 Comply with Herbicide Application Regulations: UC Berkeley will obtain all required licenses and permits before herbicide application. UC Berkeley will prepare all herbicide applications to do the following: ▸ Be implemented consistent with recommendations prepared annually by a licensed PCA. ▸ Comply with all appropriate laws and regulations pertaining to the use of pesticides and safety standards for employees and the public, as governed by the EPA, DPR, and applicable local jurisdictions.	Prior to herbicide treatments	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
ENVIRONMENTAL PROTECTION MEASURES (EPMs)			
▸ Adhere to label directions for application rates and methods, storage, transportation, mixing, container disposal, PPE, and weather limitations to application such as wind speed, humidity, temperature, and precipitation. ▸ Be applied by an applicator appropriately licensed by the state.			
EPM HAZ-4 Triple Rinse Herbicide Containers: UC Berkeley will triple rinse all herbicide and adjuvant containers with clean water at an approved site, and dispose of rinsate by placing it in the batch tank for application per 3 CCR Section 6684. Disposal of non-recyclable containers will be at legal dumpsites. Disposal of all herbicides will follow label requirements and waste disposal regulations.	Prior to, during, and following herbicide treatments	UC Berkeley	UC Berkeley
EPM HAZ-5 Minimize Herbicide Drift: UC Berkeley will employ the following parameters during foliar spray herbicide applications to minimize drift: ▸ application will cease when weather parameters exceed label specifications or when sustained winds at the site of application exceed 7 miles per hour (whichever is more conservative), as measured onsite with a hand-held anemometer or similar device immediately prior to application; ▸ spray nozzles will be configured to produce the largest appropriate droplet size to minimize drift; ▸ low nozzle pressures (30-70 pounds per square inch) will be utilized to minimize drift; and ▸ spray nozzles will be kept within 24 inches of vegetation during spraying.	During foliar spray herbicide treatments	UC Berkeley	UC Berkeley
EPM HAZ-6 Notification of Herbicide Use in the Vicinity of Public Areas: Signage will be posted at each pedestrian entry point notifying the public of upcoming and recent herbicide application locations, and footpaths and trails will be closed to the public during herbicide application. Signs will be posted before the start of treatment and notification will remain in place for at least 24 hours after treatment ceases.	Prior to, during, and following herbicide treatments	UC Berkeley	UC Berkeley
Hydrology and Water Quality Environmental Protection Measures			
EPM HYD-1 Water Quality Protections: UC Berkeley will implement the following measures to minimize impacts to water quality from treatments: ▸ Environmentally sensitive areas such as waterbodies, wetlands, or riparian areas will be identified and excluded from managed herbivory project areas using temporary fencing or active herding. A buffer of 50 feet will be maintained between sensitive and actively grazed areas. ▸ No cut material will be left within 20 feet of any watercourse or swale. A watercourse is defined as any well-defined channel (including human-made channels) with distinguishable bed and bank showing evidence of having contained flowing water indicated by deposits of rock, sand, gravel, or soil. A swale is a low-lying area between high points that conveys runoff but lacks a defined bed and bank.	Prior to, during, and following treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
ENVIRONMENTAL PROTECTION MEASURES (EPMs)			
▸ Within 50 feet of watercourses, trees will only be cut down using hand-held equipment or mechanical equipment that can be positioned 50 feet or more from a watercourse that use articulated arms. Fuels, heavy equipment, or other potentially hazardous materials will be kept at least 50 feet from watercourses to prevent accidental leaks or spills from entering the watercourse. ▸ Pile burning will not be conducted within 25 feet of a watercourse. ▸ Burn piles will not exceed 20 feet in length, width, or diameter, except when on landings, road surfaces, or on contour to minimize the spatial extent of soil damage. ▸ Where landings are located near watercourses, brow logs and orange safety netting will be installed to prevent chip movement into watercourses or natural drainage blockages. Chips would not be allowed to accumulate around fencing and cut logs. ▸ All soils, chips, and debris will be removed from ditches and drainage features of public roads at the end of each work day.			
EPM HYD-2 Avoid Impacts to Non-Target Vegetation and Sensitive Resources from Herbicides: UC Berkeley will implement the following measures when applying herbicides: ▸ Locate herbicide mixing sites in areas devoid of vegetation and where there is no potential of a spill reaching non-target vegetation or a waterway. ▸ No herbicide will be applied during precipitation events or if precipitation is forecasted to occur within 24 hours before or after treatment activities. ▸ Use only herbicides labeled for use in aquatic environments when working in riparian habitats or other areas where there is a possibility the herbicide could come into direct contact with water. Only hand application of herbicides will be allowed in riparian habitats and only during low-flow periods or when seasonal streams are dry. ▸ Herbicides that are not approved for use in aquatic environments would not be used, mixed, or stored within 60 feet of any surface waters, wetlands, or riparian areas.	During herbicide treatments	UC Berkeley	UC Berkeley
Noise Environmental Protection Measures			
EPM NOI-1 Limit Heavy Equipment Use to Daytime Hours: Operation of heavy equipment (heavy off-road equipment, tools, and delivery of equipment and materials) will occur during daytime hours if such noise would be audible to sensitive receptors (e.g., residences) and will not be scheduled during the university's Reading/Review/Recitation Week and finals week.	During treatments utilizing heavy equipment	UC Berkeley	UC Berkeley
EPM NOI-2 Maintain Equipment: All mechanical equipment and hand-operated power tools will be used and maintained according to manufacturer specifications. All diesel- and gasoline-powered equipment will be equipped with noise-reduction intake and exhaust mufflers and engine shrouds, in accordance with manufacturers' recommendations.	Prior to and during treatments utilizing heavy equipment and/or chainsaws	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
ENVIRONMENTAL PROTECTION MEASURES (EPMs)			
EPM NOI-3 Close Equipment Engine Shrouds. Equipment engine shrouds will be closed during equipment operation.	During treatments utilizing heavy equipment and/or chainsaws	UC Berkeley	UC Berkeley
EPM NOI-4 Limit Equipment Idling: All motorized construction equipment will be shut down when not in use. Idling of equipment and haul trucks will be limited to 5 minutes.	During treatments (for all treatment activities)	UC Berkeley	UC Berkeley
Wildfire Environmental Protection Measures			
EPM WIL-1 Prohibit Treatments During High Fire Danger: Vegetation treatments will not occur during extreme fire danger conditions such as red flag warnings, as posted by the local CAL FIRE unit. UC Berkeley will define the conditions under which work can proceed. It will be UC Berkeley's responsibility to determine the fire danger before the start of each work day and may determine to limit or cease operations to mitigate wildfire risk without a red flag warning. In addition, during the dry season, a ground inspection for fire will occur within 2 hours of felling, yarding, and mechanical loading activities ceasing each day, per Section 918.8, 958.8 of the California Forest Practice Rules (2020).	Prior to and during treatments (for all treatment activities)	UC Berkeley	UC Berkeley
EPM WIL-2 Require Spark Arrestors: UC Berkeley will require all mechanized hand tools to have federal- or state-approved spark arrestors.	During manual treatments utilizing mechanized hand tools	UC Berkeley	UC Berkeley
EPM WIL-3 Require Fire Suppression Tools: UC Berkeley will require tree cutting crews to carry one fire extinguisher per chainsaw. Each vehicle would be equipped with one long-handled shovel and one axe or Pulaski consistent with PRC Section 4428. A fire suppression resources inventory will be submitted to the local CAL FIRE unit before prescribed burning as required by 14 CCR Section 918.	During manual and mechanical treatments	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
Aesthetics and Visual Resource Mitigation Measures			
Mitigation Measure AES-2: Conduct Visual Reconnaissance for Prior to Implementing All Treatment Types, and Relocate or Feather and Screen Publicly Visible Treatment Areas UC Berkeley will conduct a visual reconnaissance of the treatment area before establishing ESTs, FHRs, FBs, and TRAs to observe the surrounding landscape and determine if public viewing locations, including scenic vistas, public trails, and state scenic highways, have views of the proposed treatment area. If none are identified, the treatment may be implemented without additional visual mitigation. If UC Berkeley identifies public viewing points, including heavily used scenic vistas, public trails, recreation areas, with lengthy views (i.e., longer than a few seconds) of a proposed treatment area, UC Berkeley will, before implementation, identify any change in location of the treatment site to reduce its visibility from public viewpoints. If no changes exist that would reduce impacts to public viewers and achieve the intended wildfire risk reduction objectives of the proposed treatment, UC Berkeley will thin and feather adjacent vegetation to break up the linear edges of treatment areas and strategically preserve vegetation at the edge of the treatment area, to help screen public views and minimize the contrast between the treatment area and surrounding vegetation.	Prior to treatments (for all treatment activities)	UC Berkeley	UC Berkeley
Air Quality Mitigation Measures			
Mitigation Measure AQ-1: Limit the Number and Mix of Crews and/or Use Electric Chainsaws for Mechanical and/or Manual Treatment Crews Operating on the Same Day UC Berkeley shall limit the number and mix of mechanical and manual treatment crews working on the same day in the Plan Area and/or use only electric-powered hand-held chain saws such that the combined levels of ROG or the combined levels of NOX will not exceed BAAQMD's threshold of 54 lb/day. Prior to the start of mechanical or manual treatment activity involving more than one treatment crew on a single day, UC Berkeley shall develop a plan for ensuring that the combined emissions of ROG or NOX generated by all the crews that would operate simultaneously on any single day would not exceed 54 lb/day. UC Berkeley shall only allow mechanical or manual treatment activity to occur with a plan in place that ensures emissions of ROG or NOX would not exceed 54 lb/day. For the purpose of implementing this mitigation, a mechanical crew consists of up to nine workers using up to nine pieces of power equipment, including heavy equipment (e.g., feller/bunchers, masticators); and a manual treatment crew consists of up to 15 workers using up to 15 pieces of handheld power equipment (e.g., chain saws, brush cutters, weed whips). To achieve this, UC Berkeley may determine the number and mix of mechanical and manual treatment crews using the daily emission levels for one crew presented in Table 3.3-5. For instance, UC Berkeley will not allow more than one manual treatment crew to operate on the same day because the combined level of ROG emissions from two manual treatment crews would be 58.8	Prior to and during manual and mechanical treatments	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
lb/day, which would exceed BAAQMD's threshold of 54 lb/day. UC Berkeley could allow two mechanical treatment crews to be active on the same day, or allow one mechanical treatment crew and one manual treatment crew to be active on the same day, because the combined level of emissions under these scenarios would not exceed BAAQMD's threshold of 54 lb/day for ROG or NOX. Rather than, or in combination with, limiting the number and mix of mechanical and manual treatment crews working on the same day to reduce ROG and NOX emissions below BAAQMD thresholds, UC Berkeley may use electric powered hand-held chain saws instead of petroleum powered chainsaws. The use of electric powered chainsaws would eliminate all ROG and NOX emissions generated by petroleum-powered chain saws and result in lower daily emissions of ROG and NOX generated by mechanical and manual treatment crews. Daily emission levels of different treatment crew types using electric chain saws instead of petroleum-powered chain saws are presented in Table 3.3-7. For example, using the daily emission levels presented in Table 3.3-7, UC Berkeley could allow up to two mechanical treatment crews and one manual treatment crew, which would generate combined daily emissions levels of 10.9 lb/day of ROG and 50.2 lb/day of NOX. UC Berkeley will only implement these combinations if all the crews would use electric chainsaws in place of any hand-held petroleum powered chain saws. If needed, UC Berkeley will use a mix of multiple treatment crews with and without electric chainsaws if, based on the daily emission levels presented in Table 3.3-5 and Table 3.3-7, the combined levels of ROG and NOX would not exceed BAAQMD's recommended threshold of 54 lb/day.			
Archaeological, Historical, and Tribal Cultural Resource Mitigation Measures			
Mitigation Measure CUL-1a: Conduct Archaeological Surveys Before conducting treatment activities that involve ground disturbance or prescribed burning in an area not previously surveyed for cultural resources (refer to Attachment A, Figure 3 of the Cultural Resources Sensitivity Analysis [UC Berkeley 2020] for surveyed areas), UC Berkeley will retain a qualified archaeologist to conduct a field survey for archaeological resources. If archaeological resources are found during the field survey, the resources will be inventoried using appropriate state record forms and submitted to the NWIC. The resources will be evaluated for NRHP and CRHR significance. If the resources are found to be significant, appropriate measures will be identified by the qualified cultural resource specialist and Native American representatives, implemented at the direction of UC Berkeley, and documented in the project record. Appropriate measures to minimize impacts to significant resources could include avoidance, capping, or data recovery excavations of the finds. Fencing will be installed around any resources to be avoided including a buffer area. Justification will be included for any tribal recommendations that are not implemented. If identified resources cannot be avoided, an archaeological monitor will be present during any ground disturbance or prescribed burning in the vicinity of discovered resources. The monitoring period will be determined by the qualified cultural resource specialist. If the resource is determined to not be significant, or if no resources are present within the project site, no further	Prior to ground disturbing treatments	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
mitigation would be required unless there is a discovery during a treatment activity. If additional archaeological resources are found during treatment activities, the procedures identified in Mitigation Measure CUL-1b for the discovery of unknown resources will be followed.			
Mitigation Measure CUL-1b: Protect Inadvertent Discoveries of Unique Archaeological Resources or Subsurface Historical Resources If any prehistoric or historic-era subsurface archaeological features or deposits, including locally darkened soil ("midden"), that could conceal cultural deposits, are discovered during treatment activities, all ground-disturbing activity and prescribed burning within 100 feet of the resource will be halted and a qualified cultural resource specialist will assess the significance of the find. If the find is determined to be significant by the qualified cultural resource specialist (i.e., because the find constitutes a unique archaeological resource, subsurface historical resource, or tribal cultural resource), the cultural resource specialist in consultation with Native American representatives will develop and implement appropriate procedures such that the integrity of the resource is protected (i.e., the resource stays intact and complete) and ensure that no additional resources are affected. These procedures will be documented in the project record. For any recommendations from Native American representatives that are not implemented, the reasons for not implementing the recommendations will be documented in the project record. Procedures could include, but would not be limited to, preservation in place, archival research, subsurface testing, or contiguous block unit excavation and data recovery.	During ground disturbing treatments and broadcast and pile burning	UC Berkeley	UC Berkeley
Mitigation Measure CUL-1c: Avoid and Protect Known Unique Archaeological Resources For archaeological resources that are known or those that are identified during surveys conducted pursuant to Mitigation Measure CUL-1a, and have been determined by a qualified archaeologist to qualify as a unique archaeological resource, they will be appropriately marked in consultation with Native American representatives and their locations communicated to workers to ensure protection and avoidance. Confidentiality of cultural resources sites will be maintained with minimal disclosure of site locations. If identified resources cannot be avoided, an archaeological monitor will be present during any ground disturbance or prescribed burning in the vicinity of discovered resources.	Prior to and during treatments (for all treatment activities)	UC Berkeley	UC Berkeley
Biological Resource Mitigation Measures			
Mitigation Measure BIO-1b: Conduct Special-Status Plant Surveys and Implement Avoidance Measures and Mitigation If it is determined that suitable habitat for special-status plant species is present within a treatment area (e.g., through implementation of Mitigation Measure BIO-1a) the following measures will be implemented: ▸ Prior to implementation of treatment activities and during the blooming period for the special-status plant species with potential to occur in the treatment area (see table below), as	Prior to, during, and following treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
determined during implementation of Mitigation Measures BIO-1a, a qualified botanist will conduct protocol-level surveys for special-status plants within the treatment area following survey methods from CDFW's Protocols for Surveying and Evaluating Impacts on Special Status Native Plant Populations and Natural Communities (CDFW 2018). The qualified botanist will 1) be knowledgeable about plant taxonomy, 2) be familiar with plants of the San Francisco Bay Area region, including special-status plants and sensitive natural communities, 3) have experience conducting floristic botanical field surveys as described in CDFW 2018, 4) be familiar with the California Manual of Vegetation (Sawyer et al. 2009 or current version, including updated natural communities data at http://vegetation.cnps.org/), and 5) be familiar with federal and state statutes and regulations related to plants and plant collecting. ▪ If protocol-level surveys, consisting of at least two survey visits (e.g., early blooming season and later blooming season) during a normal weather year, have been completed in the 5 years before implementation of the treatment project and no special-status plants were found, and no treatment activity occurred after the protocol-level survey, treatment may proceed in that area without additional plant surveys. ▸ If special-status plants are not found, the botanist will document the findings in a letter report to UC Berkeley and no further mitigation will be required. ▸ If special-status plant species are found, the plant will be avoided completely, if feasible (i.e., project objectives can still be met). This may include establishing a no-disturbance buffer around the plants and demarcation of this buffer by a qualified biologist or botanist using flagging or high-visibility construction fencing. The size of the buffer will be determined by the qualified biologist or botanist and will be large enough to avoid direct or indirect impacts on the plant. ▸ If special-status plant species are found that cannot be avoided during treatments because the treatment objectives cannot be met if the special-status plant is avoided, the following will be implemented: ▪ The qualified botanist will determine if the special-status plant population will benefit from treatment in the occupied habitat area even though some of the individual plants may be adversely affected during treatment activities. If the qualified botanist determines that treatment activities will be beneficial to a special-status plant population, no compensatory mitigation will be required. For a treatment to be considered beneficial to special-status plants, the qualified botanist will demonstrate that habitat function (i.e., the arrangement and capability of habitat features to provide refuge, foraging, and reproduction habitat to plants and animals, and thereby contribute to the conservation of biological and genetic diversity and evolutionary processes) is expected to improve with implementation of the treatment such that special-status plant populations would expand, regenerate, or display increased vigor after treatment implementation. This determination will consider and cite			

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
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scientific studies demonstrating that the species or a similar species has benefitted from increased sunlight from canopy opening, eradication of invasive species, or otherwise reduced competition for resources. This determination will be documented in the survey results letter report. UC Berkeley may consult with CDFW and/or USFWS for technical information regarding this determination. ▪ **Plants with California Rare Plant Rank 1, 2, or 3**. If a qualified botanist determines that treatment activities will not be beneficial to a special-status plant population and the species is not listed under ESA, CESA, or NPPA, the qualified botanist will determine if treatment would substantially reduce the abundance, distribution, and viability of local and regional populations as defined by the loss of special-status plants restriction the range of the plant, or substantial modification of habitat function such that the habitat would be rendered unsuitable. The qualified botanist will demonstrate that the abundance, distribution, and viability of local and regional populations of the specific species found would be maintained with implementation of the treatment; this will be documented in the survey results letter report. If the qualified botanist determines that the abundance, distribution, and viability of local and regional populations will not be maintained with implementation of the treatment, UC Berkeley will prepare a Compensatory Mitigation Plan. ▪ **Federally or State-Listed Plants**. If a qualified botanist determines that treatment activities will not be beneficial to the plant and the species is listed under ESA, CESA, or NPPA, the qualified botanist will determine if treatment would damage or kill listed plants, or adversely modify their habitat resulting in reduced growth and reproduction or death and loss of listed plant occurrences. This determination will be documented in the survey results letter report. If the qualified botanist determines that treatment will damage or kill listed plants, or adversely modify their habitat resulting in reduced growth and reproduction or death and loss of listed plant occurrences, UC Berkeley will prepare a Compensatory Mitigation Plan. ▸ If a Compensatory Mitigation Plan is warranted, the following will be implemented: ▪ The Compensatory Mitigation Plan will describe the appropriate conservation measures and compensatory mitigation strategy being implemented to compensate for unavoidable losses of special-status plants. The plan will address direct and indirect impacts that could occur as a result of treatment activities and will implement the conservation measures and compensatory mitigation to ensure that treatment will not result in a net loss of the special-status plant. Conservation measures and compensatory mitigation may include preserving and enhancing existing populations, creating off-site populations on mitigation sites through seed collection or transplantation, and/or restoring or creating suitable habitat, and must meet the success criteria described below. If the special-status plant taxa are listed under ESA, CESA, or NPPA, the plan will be submitted to CDFW and/or USFWS (as appropriate) for review and comment.			

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
▪ Success criteria for preserved and compensatory populations would include: ▪ The extent of occupied area and plant density (number of plants per unit area) in compensatory populations would be equal to or greater than the affected occupied habitat. ▪ Compensatory and preserved populations would be self-producing. Populations would be considered self-producing when: o plants reestablish annually for a minimum of five years with no human intervention such as supplemental seeding; and o reestablished and preserved habitats contain an occupied area and flower density comparable to existing occupied habitat areas in similar habitat types in the treatment area vicinity. ▪ If off-site conservation includes dedication of conservation easements, purchase of mitigation credits, or other off-site conservation measures, the details of these measures would be included in the plan, including information on responsible parties for long-term management, conservation easement holders, long-term management requirements, success criteria such as those listed above and other details, as appropriate to target the preservation of long term viable populations. o If relocation efforts are part of the Compensatory Mitigation Plan, the plan would include details on the methods to be used, including collection, storage, propagation, receptor site preparation, installation, long-term protection and management, monitoring and reporting requirements, success criteria such as those listed above, and remedial action responsibilities should the initial effort fail to meet long-term conservation requirements.			
Mitigation Measure BIO-2b: Implement Alameda Whipsnake Avoidance and Minimization Measures Regardless of the results of the reconnaissance-level survey required under Mitigation Measure BIO-1a or habitat assessment required under Mitigation Measure BIO-2a, before implementation of treatment projects (including initial treatment activities and treatment maintenance) under the WVFMP, the following measures will be incorporated into project design: ▸ A qualified biologist will conduct a pre-treatment survey for Alameda whipsnake within 24 hours of initiation of initial treatment activities or treatment maintenance in treatment area. In addition, a qualified biologist will conduct a daily pre-activity Alameda whipsnake survey sweep for treatments that require more than one day to implement. If an Alameda whipsnake is observed, the qualified biologist will identify actions sufficient to avoid impacts on the species (e.g., halt work) and to allow it to leave the area on its own volition.	Prior to and during treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
▸ A qualified biologist will monitor all treatment activities. The biologist will monitor the implementation of treatment activities to look for whipsnake and to ensure the measures to avoid impacts on the species are followed. The biologist will monitor truck and equipment access (i.e., the biologist will walk in front of truck or equipment on access roads ordinarily closed to vehicle traffic to look for whipsnake). ▸ UC Berkeley (or contractors) will immediately (i.e., the same day) process (remove completely from the treatment area, chip, gasify, or permanently place within the treatment area for soil stabilization) all cut materials (i.e., brush, stems, slash, and logs) as they are produced to avoid attracting Alameda whipsnake to the vegetation piles. ▸ If processing within the same day is not feasible, UC Berkeley (or contractors) will determine suitable location(s) outside of suitable scrub and directly adjacent woodland/grassland habitat (e.g., within landings or temporary refuge areas), in coordination with a qualified biologist, for temporary storage of cut materials that cannot be processed immediately. Log trailers could be used as biomass repositories and removed when full. If vegetation must be removed to create a temporary storage location, UC Berkeley (or contractors) will remove understory vegetation first to facilitate visibility of Alameda whipsnake by a qualified biologist, followed by trees. Then, UC Berkeley (or contractors) will install temporary fencing to exclude Alameda whipsnake. If temporary exclusion fencing is installed, UC Berkeley (or contractors) will prepare an exclusion fencing plan that identifies the size and location of temporary staging areas, the fencing materials to be used, installation instructions, and monitoring requirements. Cut vegetation that will be burned in piles during biomass disposal and utilization will not be placed on top of burrows. Burn piles will be lit from one end (uphill side on slopes) to allow Alameda whipsnakes, that may be using the pile for refuge, to escape. Piles will not be burned during the winter when Alameda whipsnake may be using them as winter retreats (generally November through February or March, as determined by a qualified biologist based on temperature and weather conditions). ▸ In suitable habitat where suitable winter retreats may be present (e.g., within native scrub habitat not degraded by substantial nonnative tree overstory, rock outcrops within approximately 50 feet of scrub habitat), as determined by a qualified biologist, UC Berkeley (or contractors) will avoid ground disturbance and use of heavy equipment during the winter (generally November through February or March, as determined by a qualified biologist based on temperature and weather conditions). ▸ Unless removal is required to meet program objectives, UC Berkeley (or contractors) will avoid uprooting any native species within native scrub habitat, as determined by a qualified biologist, and in other habitat, UC Berkeley (or contractors) will retain native species.			

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
Based on the results of the habitat assessment required under Mitigation Measure BIO-2a in this EIR, a qualified biologist will determine if any of the following would occur after implementation of the measures listed above: residual loss of habitat function for Alameda whipsnake; injury or mortality of Alameda whipsnake; or disturbance of Alameda whipsnake that could substantially disrupt essential behavior patterns (e.g., breeding, feeding, or sheltering) to such an extent that injury or mortality is likely. If a qualified biologist determines that these impacts are unlikely, treatment may proceed. If a qualified biologist determines that loss of habitat function for Alameda whipsnake is likely; injury or mortality of Alameda whipsnake is likely; or disturbance of Alameda whipsnake is likely which could substantially disrupt essential behavior patterns (e.g., breeding, feeding, or sheltering) to such an extent that injury or mortality is likely, after implementing the measures identified above, then additional feasible measures will be implemented, as determined in consultation with a qualified biologist. These measures may include the following (and potentially others not listed below): ▶ UC Berkeley (or contractors) will not conduct treatment activities within 100 feet of scrub habitat in areas where it is likely that Alameda whipsnake could occur, as identified by a qualified biologist. ▶ UC Berkeley (or contractors) will only operate heavy equipment from developed or disturbed areas (e.g., existing roads). ▶ UC Berkeley (or contractors) will limit vegetation removal to trees/clumps of trees and nonnative shrubs (e.g., French broom) that can be removed from developed areas (e.g., established roads) or bare areas (i.e., disturbed areas devoid of vegetation and burrows) without ground disturbance outside the road or bare area. The biological monitor will inspect trees and shrubs for whipsnake immediately before removal. ▶ UC Berkeley (or contractors) will avoid ground disturbance during vegetation removal (i.e., the stump and roots will remain at a height such that ground disturbance is avoided). UC Berkeley (or contractors) will also avoid disturbance of shrub understory and duff, bark, or branches built up at the base of a tree. If disturbance of shrub understory and duff, bark, or branches at the base of the tree is not feasible (i.e., the stump height remains too high to meet fuel-reduction objectives), UC Berkeley (or contractors) may clear duff, bark, or branches built up at the base of the tree by hand only to the extent needed, while allowing for visibility of Alameda whipsnake by the biological monitor, before cutting the tree closer to the base. UC Berkeley (or contractors) will not disturb roots or soil during hand work. ▶ UC Berkeley (or contractors) will avoid disturbance to suitable rock outcrop habitat by maintaining rock and native shrubs within 50 feet of rock outcroppings. If a qualified biologist determines that disturbance, injury, or mortality of Alameda whipsnake cannot be avoided through implementation of additional measures, then UC Berkeley would consult with CDFW and USFWS before treatment activities occur and implement any additional measures, including avoidance or compensatory actions, determined through consultation and/or required by			

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
incidental take authorization to mitigate impacts on Alameda whipsnake pursuant to CESA and ESA. These additional measures may include installation of exclusion fencing around treatment areas, purchase of credits at a conservation bank, creation of additional habitat, adaptive management strategies, and/or long-term monitoring of treated habitat within the Plan Area to determine whether treatment has improved habitat for Alameda whipsnake. No actions that could adversely affect Alameda whipsnake will be allowed if disturbance, injury, or mortality of Alameda whipsnake could result, unless consultation with CDFW and USFWS is completed and additional measures are implemented as required through consultation.			
Mitigation Measure BIO-2d: Conduct Surveys for Western Pond Turtle, Implement Avoidance Measures, and Relocate Individuals If it is determined that suitable aquatic or upland habitat for western pond turtle is present within a treatment area (e.g., through implementation of Mitigation Measure BIO-1a), the following measures will be implemented within 24 hours before implementation of treatment activities: ▸ A qualified biologist familiar with the life history of western pond turtle and experience performing surveys for western pond turtle will conduct a focused survey of suitable habitat within the treatment area. If potentially suitable aquatic habitat is present within a treatment area (e.g., creeks, streams, ponds, drainages), upland habitat within approximately 1,500 feet of this aquatic habitat will also be surveyed. The qualified biologist will inspect the treatment area for western pond turtles as well as suitable burrow habitat. ▸ If western pond turtles are not detected during the focused survey, then further mitigation is not required. ▸ If western pond turtles are detected, a no-disturbance buffer of at least 100 feet will be established around any identified nest sites or overwintering sites. A qualified biologist with an appropriate CDFW Scientific Collecting Permit that allows handling of reptiles will be present during treatment activities and will inspect the treatment area before initiation of treatment activities. If western pond turtles are detected, the qualified biologist will move the turtles downstream and out of harm's way.	Prior to and during manual and mechanical treatments	UC Berkeley	UC Berkeley
Mitigation Measure BIO-2e: Conduct Protocol-level Surveys for Burrowing Owl, Implement Avoidance Measures, and Compensate for Loss of Occupied Burrows If it is determined that suitable habitat for burrowing owl is present within a treatment area (e.g., through implementation of Mitigation Measure BIO-1a), the following measures will be implemented during the planning stages of a treatment project under the WVFMP: ▸ A qualified biologist with familiarity of burrowing owl life history and survey protocols will conduct a burrowing owl habitat assessment in accordance with Appendix C of the CDFW Staff Report on Burrowing Owl Mitigation (CDFW 2012, or most current version) (CDFW Staff Report).	Prior to and during treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
▸ If the treatment area does not contain suitable burrowing owl habitat (e.g., ruderal grassland, successional grassland, scrub habitat with sparse shrub cover, mammal burrows or burrow surrogates, friable soil), as determined by the qualified biologist, then further mitigation for burrowing owl is not required. ▸ If the qualified biologist determines that suitable burrowing owl habitat is present within the treatment area, then the qualified biologist will conduct focused breeding and nonbreeding season surveys for burrowing owls in areas of suitable habitat identified during the habitat assessment or reconnaissance-level survey (e.g., ruderal grassland, successional grassland, scrub habitat with sparse shrub cover) on and within 1,500 feet of the treatment area. Surveys will be conducted before the start of treatment activities and in accordance with Appendix D of the CDFW Staff Report. ▸ If no occupied burrows are found, the qualified biologist will submit a letter report documenting the survey methods and results to UC Berkeley and no further mitigation will be required. ▸ If an active burrow is found within 1,500 feet of a treatment area and treatment activities would occur during the nonbreeding season (September 1 through January 31), UC Berkeley will consult with CDFW during treatments. If occupied burrows are present that cannot be avoided or adequately protected with a no-disturbance buffer, a burrowing owl exclusion plan will be developed, as described in Appendix E of the CDFW Staff Report. Burrowing owls will not be excluded from occupied burrows until the project's burrowing owl exclusion plan is approved by CDFW. The exclusion plan will include a plan for creation, maintenance, and monitoring of artificial burrows in suitable habitat. ▸ If an active burrow is found during the breeding season (February 1 through August 31), occupied burrows will not be disturbed and will be provided with a protective buffer unless a qualified biologist verifies through noninvasive means that either: (1) the birds have not begun egg laying, or (2) juveniles from the occupied burrows are foraging independently and are capable of independent survival. The size of the buffer will depend on the time of year and level of disturbance as outlined in the CDFW Staff Report. The size of the buffer may be reduced if a broad-scale, long-term, monitoring program acceptable to CDFW is implemented so that burrowing owls are not adversely affected. Once the fledglings are capable of independent survival, the owls can be evicted and the burrow can be destroyed per the terms of a CDFW-approved burrowing owl exclusion plan developed in accordance with Appendix E of CDFW Staff Report. ▸ If active burrowing owl nests are found within a treatment area and are destroyed by implementation of treatment activities, UC Berkeley will mitigate the loss of occupied habitat in accordance with guidance provided in the CDFW Staff Report, which states that permanent impacts on nesting, occupied and satellite burrows, and burrowing owl habitat will be mitigated such that habitat acreage and number of burrows are replaced through permanent conservation of comparable or better habitat with similar vegetation communities and			

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
burrowing mammals (e.g., ground squirrels) present to provide for nesting, foraging, wintering, and dispersal. UC Berkeley will retain a qualified biologist to develop a burrowing owl mitigation and management plan that incorporates the following goals and standards: ▪ Mitigation lands will be selected based on comparison of the habitat lost to the compensatory habitat, including type and structure of habitat, disturbance levels, potential for conflicts with humans, pets, and other wildlife, density of burrowing owls, and relative importance of the habitat to the species range wide. ▪ If feasible, mitigation lands will be provided adjacent or proximate to the project site so that displaced owls can relocate with reduced risk of injury or mortality. Feasibility of providing mitigation adjacent or proximate to the project site depends on availability of sufficient suitable habitat to support displaced owls that may be preserved in perpetuity. ▪ If suitable habitat is not available for conservation adjacent or proximate to the project site, mitigation lands will be focused on consolidating and enlarging conservation areas outside of urban and planned growth areas and within foraging distance of other conservation lands. Mitigation may be accomplished through purchase of mitigation credits at a CDFW-approved mitigation bank, if available. If mitigation credits are not available from an approved bank and mitigation lands are not available adjacent to other conservation lands, alternative mitigation sites and acreage will be determined in consultation with CDFW. ▪ If mitigation is not available through an approved mitigation bank and will be completed through permittee-responsible conservation lands, the mitigation plan will include mitigation objectives, site selection factors, site management roles and responsibilities, vegetation management goals, financial assurances and funding mechanisms, performance standards and success criteria, monitoring and reporting protocols, and adaptive management measures. Success will be based on the number of adult burrowing owls and pairs using the site and if the numbers are maintained over time. Measures of success, as suggested in the CDFW Staff Report, will include site tenacity, number of adult owls present and reproducing, colonization by burrowing owls from elsewhere, changes in distribution, and trends in stressors.			
Mitigation Measure BIO-2f: Conduct Focused Surveys for Nesting Raptors and Other Native Nesting Birds and Implement Protective Buffers If it is determined that suitable habitat for nesting raptors or other native nesting birds, including special-status species (i.e., white-tailed kite, northern harrier, yellow warbler) is present within a treatment area (e.g., through implementation of Mitigation Measure BIO-1a), the following measures will be implemented: ▶ To minimize the potential for loss of nesting raptors and other birds, treatment activities will be conducted during the nonbreeding season (approximately September 1-January 31, as determined by a qualified biologist), if feasible. If treatment activities are conducted during the nonbreeding season, no further mitigation will be required.	Prior to, during, and following treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
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▶ Within 14 days before the onset of treatment activities during the breeding season (approximately February 1 through August 31, as determined by a qualified biologist), a qualified biologist familiar with birds of California and with experience conducting nesting bird surveys will conduct focused surveys for white-tailed kites, northern harrier, other nesting raptors and other native birds and will identify active nests within 500 feet of the site. ▶ Because the nests of yellow warbler are small and difficult to find, occupancy of suitable habitat (i.e., riparian woodland) for this species will be determined by a qualified biologist familiar with the life history of yellow warbler and with experience identifying the calls of yellow warbler. If yellow warblers are observed calling, exhibiting territorial displays, carrying nest materials, carrying prey, or other signs of breeding behavior, the habitat will be considered occupied. ▶ Impacts on nesting birds will be avoided by establishing appropriate buffers around active nest sites identified during focused surveys to prevent disturbance to the nest. Activity will not commence within the buffer areas until a qualified biologist has determined that the young have fledged, the nest is no longer active, or reducing the buffer will not likely result in nest abandonment. An avoidance buffer of 0.25 mile will be implemented for white-tailed kite, in consultation with CDFW. For other species, a qualified biologist will determine the size of the buffer for non-raptor nests after a site- and nest-specific analysis. Buffers typically will be 500 feet for raptors (other than white-tailed kite) and 100 feet for non-raptor species. Factors to be considered for determining buffer size will include presence of natural buffers provided by vegetation or topography, nest height above ground, baseline levels of noise and human activity, species sensitivity, and expected treatment activities. The size of the buffer may be adjusted if a qualified biologist determines that such an adjustment would not be likely to adversely affect the nest. Any buffer reduction for a special-status species (i.e., white-tailed kite, northern harrier, yellow warbler) from the typical size (i.e., 0.25 mile, 500 feet, 100 feet, respectively) will require consultation with CDFW. Periodic monitoring of the nest by a qualified biologist during and after treatment activities will be required if the activity has potential to adversely affect the nest, the buffer has been reduced, or if birds within active nests are showing behavioral signs of agitation (e.g., standing up from a brooding position, flying off the nest) during treatment activities, as determined by the qualified biologist. ▶ Removal of golden eagle nests is prohibited regardless of the occupancy status under the federal Bald and Golden Eagle Protection Act. If golden eagle nests are found during focused surveys, then the nest tree shall not be removed.			

<table>
<tr><th>Environmental Protection Measures and Mitigation Measures</th><th>Timing</th><th>Implementing Entity</th><th>Verifying/Monitoring Entity</th></tr>
<tr><td colspan="4">MITIGATION MEASURES</td></tr>
<tr><td>Mitigation Measure BIO-2g: Conduct Focused Surveys for Monarch Overwintering Colonies and Implement Avoidance Measures
If it is determined that a monarch overwintering colony or suitable overwintering habitat is present within a treatment area (e.g., through implementation of Mitigation Measure BIO-1a), the following measures will be implemented:
▸ To minimize the potential for loss of monarch overwintering colonies, treatment activities within suitable overwintering habitat (e.g., coniferous forest, eucalyptus forest) will be conducted from April through September to avoid the overwintering season (October through March), if feasible. If treatment activities are conducted outside of the overwintering season, no further mitigation will be required.
▸ Within 14 days before the onset of treatment activities between October 1st and March 31st, a qualified biologist familiar with monarchs and monarch overwintering habitat will conduct focused surveys for monarch colonies within suitable habitat in the treatment area and will identify any colonies found within the treatment area.
▸ Monarch overwintering colonies that are identified within a treatment area will be demarcated with flagging or high-visibility construction fencing to prevent removal of the stand of trees containing the overwintering colony and encroachment by heavy machinery, vehicles, or personnel. Removal of the tree or stand of trees that contains the overwintering colony will not occur until the monarchs have left the area, as determined by a qualified biologist.
▸ If modification or removal of a stand that contains an identified overwintering colony is required to meet treatment objectives and cannot be delayed, UC Berkeley will prepare and implement a site-specific treatment plan for the stand with the goal of maintaining habitat function for the monarch overwintering colony, following feasible recommendations from Protecting California's Butterfly Groves Management Guidelines for Monarch Butterfly Overwintering Habitat (Xerces 2017). Examples of management strategies that could be considered to maintain habitat function include:
▪ remove or trim hazard trees;
▪ selectively remove or trim of trees to create a heterogeneous habitat that provides access to sunlight and shade for monarchs;
▪ maintain suitable wind protection in the stand; and
▪ replace removed trees with native trees in strategic locations to provide additional wind protection.</td><td>Prior to and during treatments (for mechanical and manual treatment activities)</td><td>UC Berkeley</td><td>UC Berkeley</td></tr>
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Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
Mitigation Measure BIO-2h: Conduct Focused American Badger Survey and Establish Protective Buffers If it is determined that suitable habitat for American badger is present within a treatment area (e.g., through implementation of Mitigation Measure BIO-1a), the following measures will be implemented for treatment projects under the WVFMP: ▸ Within 30 days before commencement of treatment activities, a qualified wildlife biologist with familiarity with American badger and experience using survey methods for the species will conduct focused surveys of suitable habitat within the treatment area to identify any American badger burrows or dens. ▸ If occupied burrows are not found, further mitigation is not required. If occupied burrows are found, impacts on active badger dens will be avoided by establishing exclusion zones around all active badger dens, the size of which will be determined by the qualified biologist. No treatment activities will occur within the exclusion zone until denning activities are complete or the den is abandoned, as confirmed by a qualified biologist. The qualified biologist will monitor each den once per week to track the status of the den and to determine when it is no longer occupied. When it is no longer occupied, treatment activities within the exclusion zone may occur.	Prior to and during treatments (for all treatment activities)	UC Berkeley	UC Berkeley
Mitigation Measure BIO-2i: Conduct Focused Noninvasive Surveys for Mountain Lion Dens and Implement Avoidance Measures If it is determined that potentially suitable den habitat (e.g., caves, other large natural cavities, thickets) for mountain lion is present within a treatment area (e.g., through implementation of Mitigation Measure BIO-1a) or signs of mountain lion activities are observed (e.g., tracks, scat, carcasses or bones of prey species), the following measures will be implemented for treatment projects under the WVFMP: ▸ Within 7 days before commencement of treatment activities, a qualified wildlife biologist with familiarity with mountain lion and experience using survey methods for the species will conduct focused surveys of suitable habitat within the treatment area to identify any potential mountain lion nurseries. Potential mountain lion dens include caves, large natural cavities within rocky areas, or thickets deemed appropriate for use by mountain lions based on size and other characteristics (e.g., proximity to human development, surrounding habitat). The qualified wildlife biologist will also survey for signs of mountain lion (e.g., tracks, scat, carcasses or bones of prey species) in the vicinity of potential nursery habitat to help determine whether the area may contain a mountain lion nursery. ▸ If signs of a nursery are found during surveys (or during other biological monitoring, when occurring), further investigation will be required to determine if a mountain lion nursery is present. No treatment will occur in the area while further investigation is occurring. Survey methods will include the use of trail cameras, track plates, hair snares, and/or other noninvasive	Prior to treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
methods, as well as coordination with local experts tracking the species (if available). Surveys using these noninvasive methods will be conducted for three days and three nights to determine whether a nursery may be present. ▪ If a potential den site is determined to be unoccupied by mountain lion, no further mitigation is required. However, dens occupied by another carnivore species will not be disturbed or destroyed while any young are dependent on the den (in compliance with California Fish and Game Code sections on furbearers). ▪ If a nursery is discovered or further signs of a nursery are detected (e.g., lactating adult females or kittens on camera, repeated detections of an adult female in the area, growls or calls from kittens), UC Berkeley will implement a no-disturbance buffer of at least 2,000 feet (Wilmers et al. 2013) around the nursery or signs of a nursery for a minimum of 10 weeks. Treatment activities will not occur within this buffer during this time to avoid disturbance, injury, or mortality of mountain lion nurseries. ▪ UC Berkeley may consult with CDFW for technical information regarding other measures to avoid disturbance, injury, or mortality.			
Mitigation Measure BIO-2j: Conduct Focused Surveys for San Francisco Dusky-Footed Woodrat; Implement Avoidance Measures, or Relocate Nests If it is determined that suitable habitat (e.g., woodland, forest, scrub) for San Francisco dusky-footed woodrat is present within a treatment area (e.g., through implementation of Mitigation Measure BIO-1a), the following measures will be implemented for treatment projects under the WVFMP: ▸ Within seven days before initiation of treatment activities, a qualified biologist with familiarity with woodrats and experience conducting woodrat surveys will conduct a focused survey for San Francisco dusky-footed woodrat nests within the treatment area, within all associated access roads and staging areas, and within a sufficient buffer surrounding these areas where indirect disturbance could occur, as determined by the qualified biologist. ▸ If no woodrat nests are found during the focused survey, the qualified biologist will submit a letter report summarizing the results of the survey to UC Berkeley, and no further mitigation would be required. ▸ If woodrat nests are detected within the treatment area, the qualified biologist will determine whether the nest is active; this is typically determined through the presence of large amounts of scat. If active woodrat nests are present that can be avoided, the perimeter of these nests will be demarcated with high-visibility construction fencing to prevent accidental encroachment by vehicles, equipment, or personnel. ▸ If active woodrat nests within a treatment area are detected that cannot be avoided, and treatment activities are planned to occur during the woodrat breeding season (April through June), these active nests must be avoided until the end of the breeding season.	Prior to treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
▶ If active woodrat nests within a treatment area cannot be avoided, and treatment activities are planned to occur outside of the woodrat breeding season, a CDFW-approved qualified biologist will dismantle the woodrat nest by hand, removing the materials layer by layer to allow adult woodrats to escape. If young are discovered during the disassembling process, the qualified biologist will leave the area for at least 24 hours to allow the adult woodrats to relocate their young on their own. ▶ When the disassembly process is completed, the nest materials will be collected and moved to another suitable nearby location to allow for nest reconstruction.			
Mitigation Measure BIO-2k: Conduct Focused Bat Surveys and Implement Avoidance Measures If it is determined that suitable roost habitat (e.g., woodland, forest, scrub) for pallid bat, Townsend's big-eared bat, or western red bat is present within a treatment area (e.g., through implementation of Mitigation Measure BIO-1a), the following measures will be implemented for treatment projects under the WVFMP: ▶ In the early planning stages of treatment projects, a qualified biologist with familiarity with bats and bat ecology, and experience conducting bat surveys will conduct surveys for bat roosts in suitable habitat (e.g., large trees, crevices, cavities, exfoliating bark, bridges, unoccupied buildings) within and adjacent to a treatment area. ▶ If no evidence of bat roosts is found, then no further study will be required. ▶ If evidence of bat roosts is observed, the species and number of bats using the roost will be determined. Bat detectors may be used to supplement survey efforts. A no-disturbance buffer of 250 feet will be established around active pallid bat, Townsend's big-eared bat, or western red bat roosts, and mechanical and manual treatments will not occur within this buffer. Prescribed broadcast burning activities and pile burning within this buffer will be implemented outside of the bat breeding season, which is April 1–August 31.	Prior to treatments (for all treatment activities)	UC Berkeley	UC Berkeley
Mitigation Measure BIO-3a: Conduct Protocol-Level Surveys for Sensitive Natural Communities and Riparian Habitat and Implement Avoidance Measures If it is determined that sensitive natural communities or riparian habitat may be present within a treatment area (e.g., through implementation of Mitigation Measure BIO-1a), the following measures will be implemented before treatment: ▶ A qualified botanist will perform a protocol-level survey of the proposed treatment area for sensitive natural communities and sensitive habitats (including riparian habitat) following the CDFW's Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities (CDFW 2018). Sensitive natural communities will be identified using the best available and current data, including keying them out using the most current edition of A Manual of California Vegetation (including updated natural	Prior to and during treatments (for all treatment activities) Surveys are complete for Identified Treatment Projects, but require verification prior to maintenance treatments	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
communities data at http://vegetation.cnps.org/), or referring to relevant reports (e.g., reports found on the VegCAMP website). ▸ Before implementation of treatment activities, all sensitive habitats identified during surveys will be flagged or fenced with brightly visible construction flagging and/or fencing under the direction of the qualified biologist and no treatment activities will occur within these areas. Foot traffic by personnel shall also be limited in these areas to prevent the introduction of invasive or weedy species or inadvertent crushing of plants. Periodic inspections during construction shall be conducted by the monitoring biologist to maintain the integrity of exclusion fencing/flagging throughout the period of construction involving ground disturbance. If after implementation of Mitigation Measure BIO-3a sensitive natural communities or riparian habitat are determined to be present within a treatment area and cannot be avoided because the treatment objectives cannot be met if the sensitive natural community or riparian habitat is avoided, the following measures will be implemented: ▸ A qualified botanist with knowledge of the affected sensitive natural community or riparian habitat will review the treatment design and applicable impact minimization measures (potentially including others not listed above) to determine if the implementation of the treatment is anticipated to result in a loss of habitat function (i.e., the location, essential habitat features, and species supported are not substantially changed) of the sensitive natural community or riparian habitat. Any loss of acreage of sensitive natural communities with a rarity rank of S1 or S2 would constitute a loss of habitat function. If a qualified botanist determines the habitat function will be maintained, such that the persistence and regeneration of the habitat would not be hindered, no further mitigation will be required. If a qualified botanist determines that the loss or degradation of sensitive natural communities or riparian habitat would result in loss of habitat function after implementing feasible treatment design modifications and impact minimization measures, then Mitigation Measure BIO-3b or Mitigation Measure BIO-3c will be implemented. ▸ The only exception to this mitigation approach is in cases where it is determined by a qualified botanist that the sensitive natural community or riparian habitat would benefit from treatment in the occupied area even though some loss may occur during treatment activities. For a treatment to be considered beneficial to a sensitive natural community or riparian habitat, the qualified botanist will demonstrate that habitat function is reasonably expected to improve with implementation of the treatment such that sensitive natural community or riparian habitat would expand, regenerate, or display increased vigor after treatment implementation. Evidence supporting this conclusion could include citing scientific studies demonstrating that the community or similar community has benefitted from increased sunlight as a result of canopy opening, eradication of invasive species, or otherwise reduced competition for resources. This demonstration will be documented in a letter report to UC Berkeley. If it is determined that treatment activities would be beneficial to sensitive natural communities or riparian habitat, no compensatory mitigation will be required.			

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
Mitigation Measure BIO-3b: Compensate for Unavoidable Loss of Sensitive Natural Communities If after implementation of Mitigation Measure BIO-3a sensitive natural communities are determined to be present within a treatment area and loss of habitat function would occur as specified under Mitigation Measure BIO-3a, the following measures will be implemented for treatment projects under the WVFMP: ▸ Compensate for unavoidable loss of any sensitive natural community habitat function such that no net loss of habitat function occurs by: ▪ restoring sensitive natural community habitat function within the treatment area; ▪ restoring degraded sensitive natural communities outside of the treatment area at a sufficient ratio to offset the loss of habitat function; or ▪ preserving existing sensitive natural communities of equal or better value to the sensitive natural community affected through a conservation easement at a sufficient ratio to offset the loss of habitat function. ▸ UC Berkeley will prepare and implement a Compensatory Mitigation Plan that will include the following: ▪ For preserving existing habitat outside of the treatment area in perpetuity, the Compensatory Mitigation Plan will include a summary of the proposed compensation lands (e.g., the number and type of credits, location of mitigation bank or easement), parties responsible for the long-term management of the land, and the legal and funding mechanism for long-term conservation (e.g., holder of conservation easement or fee title). UC Berkeley will provide evidence in the plan that the necessary mitigation has been implemented or that UC Berkeley has entered into a legal agreement to implement it and that compensatory habitat will be preserved in perpetuity. ▪ For restoring or enhancing habitat within the treatment area or outside of the treatment area, the Compensatory Mitigation Plan will include a description of the proposed habitat improvements, success criteria that demonstrate the performance standard of maintained habitat function has been met, legal and funding mechanisms, and parties responsible for long-term management and monitoring of the restored or enhanced habitat. ▪ Success criteria required to maintain habitat function for preserved and compensatory populations would include: • The extent of occupied area and density of plants associated with the sensitive natural community (number of plants per unit area) in compensatory habitats would be equal to or greater than the affected occupied habitat. • Compensatory and preserved sensitive natural communities would be self-producing. Populations would be considered self-producing when:	Prior to, during, and following treatments (for all treatment activities)	UC Berkeley	UC Berkeley

<table>
<tr><th>Environmental Protection Measures and Mitigation Measures</th><th>Timing</th><th>Implementing Entity</th><th>Verifying/Monitoring Entity</th></tr>
<tr><td colspan="4">MITIGATION MEASURES</td></tr>
<tr><td>Plants associated with sensitive natural communities reestablish annually for a minimum of five years with no human intervention such as supplemental seeding; and
Reestablished and preserved habitats contain an occupied area and density comparable to existing occupied habitat areas in similar habitat types in the treatment area vicinity.</td><td></td><td></td><td></td></tr>
<tr><td>Mitigation Measure BIO-3c: Compensate for Unavoidable Loss of Riparian Habitat
If after implementation of Mitigation Measure BIO-3a riparian habitat is determined to be present within a treatment area and loss of habitat function would occur as specified under Mitigation Measure BIO-3a, the following measures will be implemented for treatment projects under the WVFMP:
UC Berkeley will compensate for unavoidable losses of riparian habitat function such that no net loss of habitat function occurs by:
restoring riparian habitat function within the treatment area;
restoring degraded riparian habitat outside of the treatment area;
purchasing riparian habitat credits at a CDFW-approved mitigation bank; or
preserving existing riparian habitat of equal or better value to the affected riparian habitat through a conservation easement at a sufficient ratio to offset the loss of riparian habitat function.
UC Berkeley will prepare and implement a Compensatory Mitigation Plan that will include the following:
For preserving existing riparian habitat outside of the treatment area in perpetuity, the Compensatory Mitigation Plan will include a summary of the proposed compensation lands (e.g., the number and type of credits, location of mitigation bank or easement), parties responsible for the long-term management of the land, and the legal and funding mechanism for long-term conservation (e.g., holder of conservation easement or fee title). UC Berkeley will provide evidence in the plan that the necessary mitigation has been implemented or that UC Berkeley has entered into a legal agreement to implement it and that compensatory plant populations will be preserved in perpetuity.
For restoring or enhancing riparian habitat within the treatment area or outside of the treatment area, the Compensatory Mitigation Plan will include a description of the proposed habitat improvements, success criteria that demonstrate the performance standard of maintained habitat function has been met, legal and funding mechanisms, and parties responsible for long-term management and monitoring of the restored or enhanced habitat.
Compensatory mitigation may be satisfied through compliance with permit conditions, or other authorizations obtained by UC Berkeley (e.g., Lake and Streambed Alteration Agreement), if these requirements are equally or more effective than the mitigation identified above.</td><td>Prior to, during, and following treatments (for all treatment activities)</td><td>UC Berkeley</td><td>UC Berkeley</td></tr>
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Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
Mitigation Measure BIO-4a: Avoid State and Federally Protected Wetlands If it is determined that wetland habitat may be present within a treatment area (e.g., through implementation of Mitigation Measure BIO-1a), the following measures will be implemented before treatment: ▸ A qualified biologist will delineate the boundaries of state or federally protected wetlands within the treatment area according to methods established in the USACE wetlands delineation manual (Environmental Laboratory 1987) and the Arid West regional supplement (USACE 2008). ▸ A qualified biologist will delineate the boundaries of wetlands that may not meet the definition of waters of the United States, but would qualify as waters of the state, according to the state wetland procedures. ▸ A qualified biologist will establish a buffer around wetlands and mark the buffer boundary with high-visibility flagging, fencing, stakes, or clear, existing landscape demarcations (e.g., edge of a roadway). The buffer will be a minimum width of 25 feet but may be larger if deemed necessary. The appropriate size and shape of the buffer zone will be determined in coordination with the qualified biologist and will depend on the type of wetland present (e.g., seasonal wetland, wet meadow, freshwater marsh, vernal pool), the timing of treatment (e.g., wet or dry time of year), whether any special-status species may occupy the wetland and the species' vulnerability to the treatment activities, environmental conditions and terrain, and the treatment activity being implemented. ▸ A qualified biologist will periodically inspect the materials demarcating the buffer to confirm that they are intact and visible, and wetland impacts are being avoided. ▸ Within this buffer, herbicide application is prohibited. ▸ Within this buffer, any ground disturbance is prohibited. Accordingly, the following activities are not allowed within the buffer zone: mechanical treatments, managed herbivory, and vehicle access or staging. ▸ Only prescribed burning may be implemented in wetland habitats if it is determined by a qualified biologist that: ▪ No special-status species are present in the wetland habitat. ▪ The wetland functions would be maintained. ▪ The prescribed broadcast burn is within the normal fire return interval for the wetland vegetation types present. ▪ Fire containment lines and pile burning are prohibited within the buffer. ▪ No fire ignition (and associated use of accelerants) will occur within the wetland buffer.	Prior to and during treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
Mitigation Measure BIO-5b: Retain Nursery Habitat and Implement Buffers to Avoid Nursery Sites If it is determined that wildlife nursery sites are present within a treatment area (e.g., through implementation of Mitigation Measure BIO-1a), the following measures will be implemented before implementation of treatment activities. In addition, if more than one year between completion of the data review and reconnaissance survey from Mitigation Measure BIO-1a has occurred, the data review and reconnaissance survey will be updated to determine if wildlife nursery sites are present within a treatment area: ▸ **Retain Known Nursery Sites.** A qualified biologist will identify the important habitat features of the wildlife nursery and, prior to treatment activities, will mark these features for avoidance and retention during treatment to maintain the function of nursery habitat. ▸ **Establish Avoidance Buffers.** UC Berkeley will establish a no-disturbance buffer around the nursery site if activities are required while the nursery site is active/occupied. The appropriate size and shape of the buffer will be determined by a qualified biologist, based on potential effects of treatment project-related habitat disturbance, noise, visual disturbance, and other factors. No treatment activity will commence within the buffer area until a qualified biologist confirms that the nursery site is no longer active/occupied. Monitoring of the effectiveness of the no-disturbance buffer around the nursery site by a qualified biologist during and after treatment activities will be required. If treatment activities cause agitated behavior of the individual(s), the buffer distance will be increased, or treatment activities modified until the agitated behavior stops. The qualified biologist will have the authority to stop any treatment activities that could result in potential adverse effects to wildlife nursery sites.	Prior to, during, and following treatments (for all treatment activities)	UC Berkeley	UC Berkeley
Hydrology and Water Quality Mitigation Measures			
Mitigation Measure HYD-1: Establish Watercourse Protection Buffers UC Berkeley will establish watercourse protection buffers (WPBs) as defined below on either side of watercourses within the Plan Area. The buffer system described below is similar to the Watercourse and Lake Protection Zone classification defined in 14 CCR Section 916.5, but has been tailored to local conditions in the Plan Area and specifics of the WVFMP. WPBs will be classified based on the uses of the stream and the presence of aquatic life. Wider WPBs are required for steep slopes. The table below provides a summary of procedures for determining WPB widths. ▸ The following WPB protections will be applied for all treatments: ▪ To protect water temperature, filter strip properties, upslope stability, and fish and wildlife values, the following vegetation retention guidelines will be implemented within WBPs: ▪ Class 1 and 2 watercourses: At least 50 percent of the overstory and 50 percent of the understory canopy covering the ground and adjacent waters will be left in a well distributed multi-storied stand composed of a diversity of species similar to that found before the start of operations.	During and following treatments (for all treatment activities)	UC Berkeley	UC Berkeley

Environmental Protection Measures and Mitigation Measures	Timing	Implementing Entity	Verifying/Monitoring Entity
MITIGATION MEASURES			
▪ Class 3 watercourses: At least 50 percent of the total canopy covering the ground will be left in a well distributed multi-storied stand configuration composed of a diversity of species similar to that found before the start of operations. At least 75 percent surface cover and undisturbed area will be retained. ▪ Equipment, including tractors and vehicles, will not be driven in wet areas or WPBs, except over existing roads or watercourse crossings where vehicle tires or tracks remain dry. ▪ Equipment used in vegetation removal operations will not be serviced in WPBs or other wet areas, or in locations that would allow grease, oil, or fuel to pass into lakes, watercourses, or wet areas. ▪ WPBs will be kept free of slash, debris, and other material, including burn piles, that could degrade water quality. Accidental deposits will be removed immediately. ▪ No fire ignition will occur within WPBs; however, low intensity backing fires may be allowed to enter or spread into WPBs. ▪ Large areas of bare soil within WPBs that are exposed by treatment activities will be stabilized with mulching, grass seeding, or soil stabilizers before the beginning of the rainy season (October 15).			
Noise and Vibration Mitigation Measures			
Mitigation Measure NOI-1: Notify Residential and Academic Land Uses At least three days prior to beginning treatment activities or biomass disposal activities using chainsaws, mechanical equipment, or water tenders, UC Berkeley will provide advanced notice to occupants of residential land uses in the City of Berkeley that are within 215 feet of such activity and occupants of residential land uses in the City of Oakland that are within 135 feet of such treatment activity. At 215 feet noise generated by chainsaws (i.e., the loudest piece of equipment) would attenuate to less than 75 dB L_{eq}, which is the City of Berkeley's noise standard for nonscheduled, intermittent, short-term operation of mobile equipment. At 135 feet noise generated by chainsaws (i.e., the loudest piece of equipment) would attenuate to less than 80 dB Leq, which is the City of Oakland's noise standard for construction-generated noise. Because the distance used for notification is based on the distance required to reduce the noise levels associated with the loudest piece of equipment to below local standards, it would be sufficient to also reduce noise levels associated with the lower volume activities and equipment. Additionally, UC facilities and academic land uses within these noise contours will be notified. Notification will include the dates and hours during which excessive noise generating activities are anticipated to occur and contact information, including a daytime telephone number, of a project representative. Recommendations to assist noise-sensitive land uses in reducing interior noise levels (e.g., closing windows and doors) will also be included in the notification.	Prior to biomass disposal and treatment activities using chainsaws, mechanical equipment, and/or water tenders	UC Berkeley	UC Berkeley

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