East Bay Hills
Roadside Vegetation
Treatment Standards
Update

HEF Approved at 12/11/19 Annual Meeting

East Bay Hills Roadside Standards

Summary of Update

In 2019, the Hills Emergency Forum Staff Liaison Committee (HEF SLC) reviewed their "East Bay Hills Roadside Vegetation Treatment Standards." The devastating 2017 and 2018 fires throughout California showed that the wind driven fires spread faster, with more erratic fire behavior than seen before. HEF SLC members recognized such conditions place greater emphasis on life safety and allow less opportunity for firefighter safety. At the same time, HEF SLC members agreed that in 2019 a greater number of people now live in our very high fire hazard areas, many of whom are older, with limited mobility or other vulnerabilities.

This "Updated East Bay Hills Roadside Vegetation Treatment Standards" places a greater focus on the role our road network plays in evacuation and life safety. It recognizes that fire fighting apparatus has gotten larger requiring additional clearances both horizontally and vertically. The goals of roadside treatment for ignition prevention and fire containment in the 2003 approved standards are still valid. However, this update expands emphasis of the key roles vegetation treatment along roadways to include:

- Reduction of potential obstructions to free access and egress (e.g. trees falling and blocking roadways).
- Reduction of flame impingement on roadway.
- Reduction of level of heat experienced along roadways by residents evacuating or firefighters responding to a fire.
- Reduction of ignition potential along roadways.
- Support of fire containment to reduce spread of fire.

Jurisdictions in the East Bay Hills

The East Bay Hills consists of multiple jurisdictions (Figure 1) that establish fire related codes and enforce these standards.

- The three cities of Berkeley, El Cerrito and Oakland are responsible for establishing standards for roadside clearances within their city boundaries.
- University of California of Berkeley is located on lands owned by the State Board of Regents. The State Fire Marshall and the California Department of Forestry and Fire Protection have responsibility for these state lands.
- The Lawrence Berkeley National Laboratory is responsible for establishing roadside clearance criteria within its boundaries, and for implementing the annual work to maintain these criteria.
- The region includes three special districts. Authorizing state legislation for East Bay Regional Park District and East Bay Municipal Utility District empower them to set standards for their own lands. Moraga Orinda Fire District provides fire protection and emergency services to the City of Orinda and Town of Moraga.
- The area also includes roadsides owned and managed by the State (CalTrans), Alameda County and Contra Costa County that set their own standards for maintenance.

Many of these jurisdictions geographically overlap resulting in questions of who establishes and enforces fire codes for any given parcel of land. Because all of the jurisdictions can be impacted by wildland fire and the need to evacuate citizens, the stakeholder agencies have come together to create a regional standard for roadside clearances to increase safety in the hills.

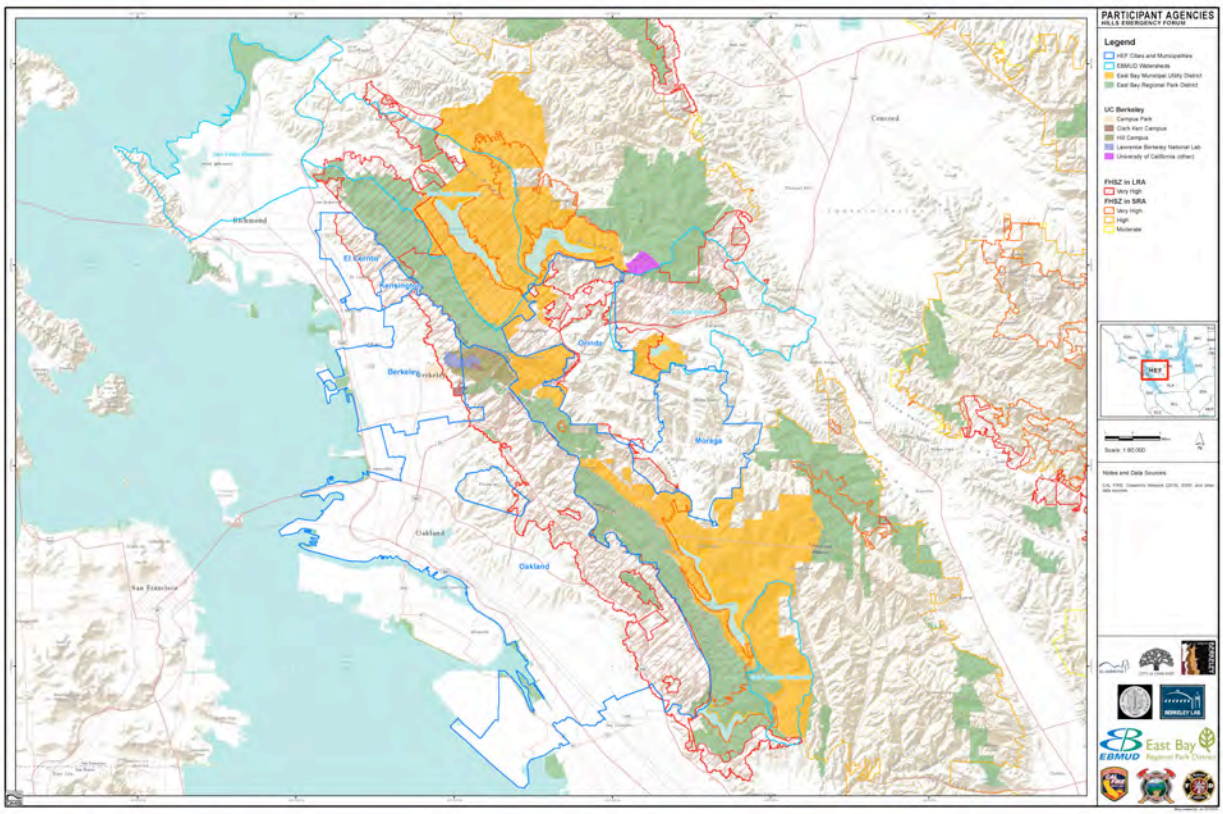

Figure 1
Map of Jurisdictions in the East Bay Hills

Existing Standards

2016 CA Fire Code (CFC) Chapter 49 Requirements for Wildland-Urban Interface Areas.

Section 4906 Hazardous Vegetation and Fuel Management.

> 4906.3 Requirements. Hazardous vegetation and fuels around all applicable buildings and structures shall be maintained in accordance with the following laws and regulations:
> 1. Public Resources Code, Section 4291.
> 2. California Code of Regulations, Title 14, Division 1.5, Chapter 7, Subchapter 3, Section 1299 (see guidance for implementation "General Guideline to Create Defensible Space").
> 3. California Government Code, Section 51182.
> 4. California Code of Regulations, Title 19, Division 1, Chapter 7, Subchapter 1, Section 3.07.

2016 CA Fire Code (CFC) Chapter 5

Section 503 Fire Apparatus Access Roads

> 503.2 Specifications. Fire apparatus access roads shall be installed and arranged in accordance with Sections 503.2.1 through 503.2.8. [California Code of Regulations, Title 19, Division 1, 3.05(a)] Fire Department Access and Egress. (Roads)

(a) Roads. Required access roads from every building to a public street shall be all-weather hard-surfaced (suitable for use by fire apparatus) right-of-way not less than 20 feet in width. Such right-of-way shall be unobstructed and maintained only as access to the public street.

503.2.1 Dimensions. Fire apparatus access roads shall have an unobstructed width of not less than 20 feet (6096 mm), exclusive of shoulders, except for approved security gates in accordance with Section 503.6, and an unobstructed vertical clearance of not less than 13 feet 6 inches (4115 mm).

The Uniform Fire Code (UFC) Division II Environmental Hazard Controls, Appendix II-A Suppression and Control of Hazardous Fire Areas provides for Clearance of Brush or Vegetative Growth from Roadways in Section 17 as paraphrased below:

The Chief may remove and clear within 10' on each side of roadway all flammable vegetation or other growth. May enter upon private property to clear. Does not apply to single specimens of trees, ornamental shrubbery or cultivated groundcovers provided that they do not form a means of readily transmitting fire. "Roadway" applies to portion of highway or private street improved or ordinarily used for vehicular traffic. This section also enables the chief to require reasonable alternatives measures.
Exception: The enforcing agency may waive or modify this requirement if in his opinion such all-weather hard-surfaced condition is not necessary in the interest of public safety and welfare.

Municipalities have adopted similar versions of Section 17, such as Berkeley Chapter 19.48 Municipal Code:

QQQ.Section 4906.6 Clearance of Brush or Vegetative Growth from Roadways [Additional subsection]. The Fire Chief is authorized to cause areas within 10 feet (3048 mm) on each side of portions of highways, streets and private roads which are improved, designed or ordinarily used for vehicular traffic to be cleared of flammable vegetation and other combustible growth. The Fire Chief is authorized to enter upon private property to do so.

Section 16 of UFC Division II provides for Clearance of Brush or Vegetative Growth from Structures (paraphrased):

Maintain around and adjacent to such building or structure a firebreak made by removing and clearing away for a distance not less than 30' on each side all flammable vegetation or other combustible growth. Section shall not apply to single specimens of trees, ornamental shrubbery or similar plants used as groundcovers provided they do not form a means of rapidly transmitting fire from the native growth to any structure. Remove portion of any tree that extends within 10' of the outlet of any chimney. Maintain any tree adjacent to or overhanging any building free of dead-wood. Maintain roof of any structure free of leaves, needles or other dead growth.

Chief may require additional fire protection or firebreak. Removal of all brush, flammable vegetation or combustible growth. Grass and vegetation located more than 30 feet from such building and less than 18" in height may be maintained where necessary to stabilize the soil and prevent erosion.

Section 16 has been adopted by adoption of the 2016 California Uniform Fire Code through local ordinances by the Cities of Berkeley, Oakland and El Cerrito and applies to all lands within their sphere of influence. The state and special districts work cooperatively with the cities and use this same standard when establishing clearance from structures.

For the State Responsibility Areas, Public Resource Code 4291 sets standards for vegetation clearance around structures, but there are no established standards for roadside clearances included in PRC 4291.

Title 14 of California Civil Code. Liens. Provides regulations relating to use of liens (for reimbursement of costs of corrective actions related to hazardous vegetation and fuel management). Municipalities have adopted code that provides additional detail such as

Berkeley Municipal Code Chapter 19.48 Section 4907.2.2 or the more detailed El Cerrito's Ordinance No. 2016-04 Chapter 16.26 Section 320.4 Abatement Procedures.

> VVV Section 4907.2.2 Corrective Actions [Additional subsection]. The City Council is authorized to instruct the Fire Chief to give notice to the owner of the property upon which conditions regulated by Section 4906.6 exist to correct such conditions. If the owner fails to correct such conditions, the City Council is authorized to cause the same to be done and make the expense of such correction a lien upon the property where such condition exists.

Municipal codes regarding blight and hazardous conditions such as City of Oakland Chapter 15. Section 15.08 Oakland Building Maintenance Code

> 15.08.020 - Purpose.
> The purpose of this Code is to provide minimum standards to safeguard life or limb, health, property, and public welfare by regulations and controlling the use and occupancy, locations, and maintenance of all residential and non-residential buildings, structures, portions thereof and real property within the City Of Oakland.

Claremont Canyon as a Model for Regional Standards

The roadside clearance standards are a part of the system of fire management and emergency access and evacuation (Figure 2). Roadside clearance needs to support the fire management strategy established by regional hazardous fuel reduction and defensible space around homes. The other mitigation measures need to be considered as the roadside standards are being established for an area. The goals for fire management include:

1. Safety of the public and emergency personnel (evacuation/ access) including: obstacle free roadways, reduced potential for flame impingement or level of heat experienced on roadways.
2. Ignition reduction.
3. Fire containment.

In extreme weather conditions the goal may only be to buy time for safe evacuation, in more normal weather conditions all three goals apply.

System of Establishing Standards for Claremont Canyon.

1. Identify the fire management compartment and strategic roadways.
2. Define the goals for the roadside in terms of fire performance (evacuation, ignition reduction, containment strategies, etc.)
3. Identify other goals or values that need to be incorporated into the treatment considerations: riparian areas, protected species, slope stability, slope aspect, erosion control etc.
4. Evaluate the roadside to identify the various conditions to be mitigated.
5. Identify the appropriate mitigation strategies.
6. Prioritize for implementation with other fire management treatments in the compartment.

Implementation will need to address both priorities and financial considerations. The development of the implementation plan is a second step after identification of the issues and evaluation of the appropriate mitigation. It is recognized that fuel break work and roadside clearance could be competing for the same mitigation funds. There is a need for both a short term and a long-term approach. The timing of funding and work cycles will need to be incorporated into the implementation plan.

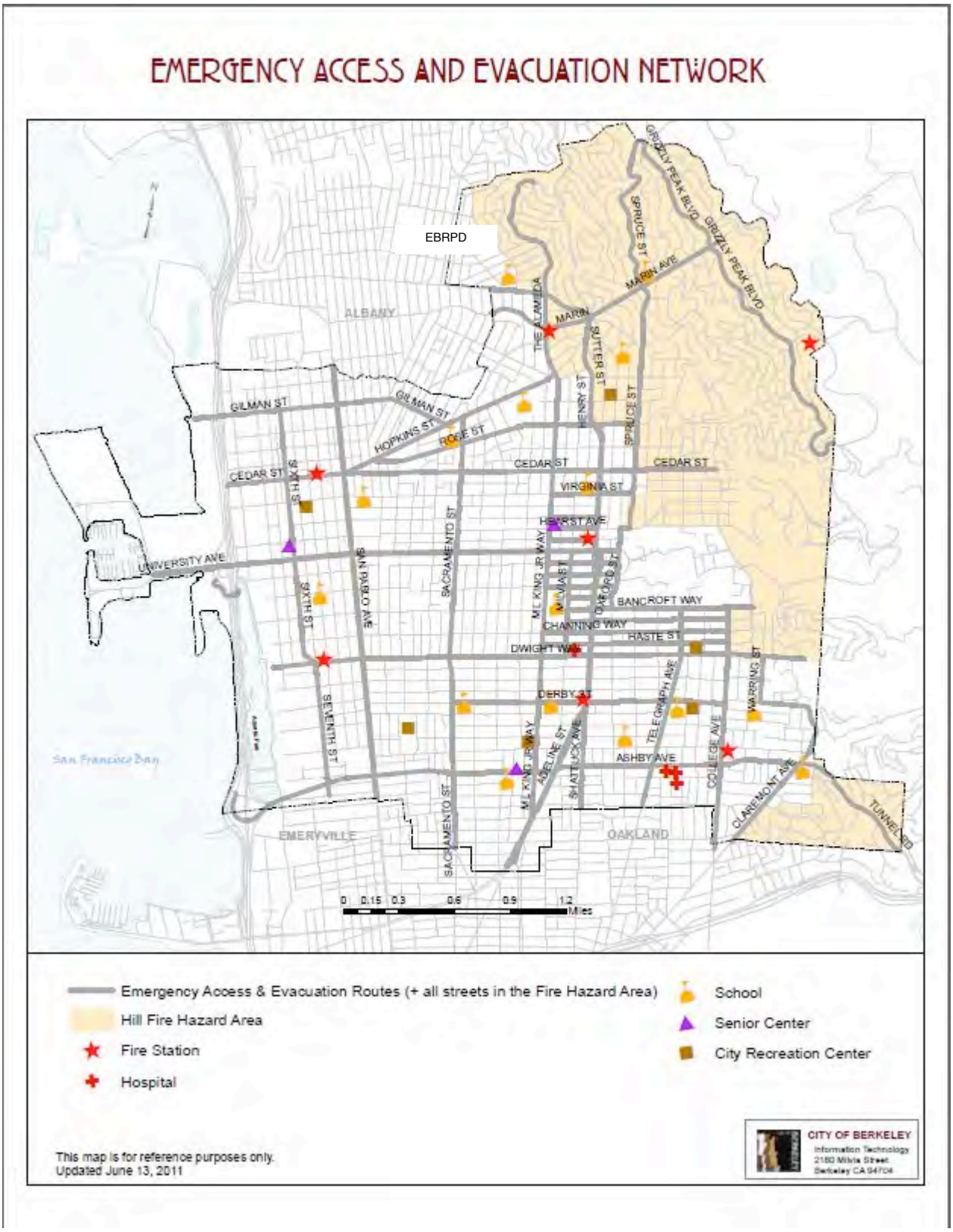

Figure 2

Map of Emergency Access & Evacuation Routes – City of Berkeley

Environmental and Regulatory Requirements

There are a number of environmental and regulatory considerations that need to be addressed in the implementation plan. Environmental considerations need to address the potential impacts of the work and what method is being used. For instance the practice of roadside spraying has added to erosion, siltation and dead brush that reduce water quality and stream protection. The required permitting processes and protection of environmentally sensitive areas need to be incorporated into the implementation of the standards.

Endangered Species: Areas of coyote brush in the canyon are a known habitat for the Federally protected Alameda Whipsnake. The US Fish and Wildlife Service must issue a permit before work can be done in this vegetation type to avoid "takings" of the protected species.

The East Bay Hills also included listed plant species and species of special concern. Implementation plans for projects will seek to avoid impacts to these species.

Stream protection: The US Army Corps of Engineers, US Fish and Wildlife Service and California Department of Fish and Game issues permits for work adjacent to streamsides. Water quality and erosion issues are covered by the Federal Clean Water Act. The City of Oakland also has an ordinance for stream protection that includes the headwater areas.

CEQA/ NEPA compliance: The California Environmental Quality Act, and Federal National Environmental Protection Act require that projects be evaluated for their impact on the environment. On-going maintenance projects might be categorically exempt if they meet certain requirements, such as on going projects. Other projects might require more extensive CEQA review.

There often are opportunities to enhance the environmental quality with projects that incorporate a wider range of stewardship issues in their planning. Fuel mitigation projects may target exotic species such as broom, eucalyptus , pampas grass, or acacia that can also assist with the goal of exotic species management. Such projects may also help reach habitat enhancement, water quality or biodiversity goals.

Claremont Canyon Description and Treatment Prescriptions

Description: Claremont Canyon is a 510-acre canyon centered on Claremont Avenue (Figure 3). There are three strategic roadways in the canyon that play a critical role in firefighter access and evacuation and connect into street networks of the cities of Berkeley and Oakland. These strategic roadways were identified by their traffic capacity and use, as well as their strategic location within the fire management compartment. They also provide access to critical facilities located in the canyon that include communication towers and water tanks.

1. Claremont Avenue runs the length of the canyon parallel to Claremont Creek from the western end to the eastern ridge. This two lane paved road does not have curbs or shoulders. The adjacent topography limits the number of turnouts.
2. Grizzly Peak Boulevard is located along the eastern ridgeline. This two lane paved road does not have curbs or defined shoulders. The adjacent topography limits the number of turnouts.

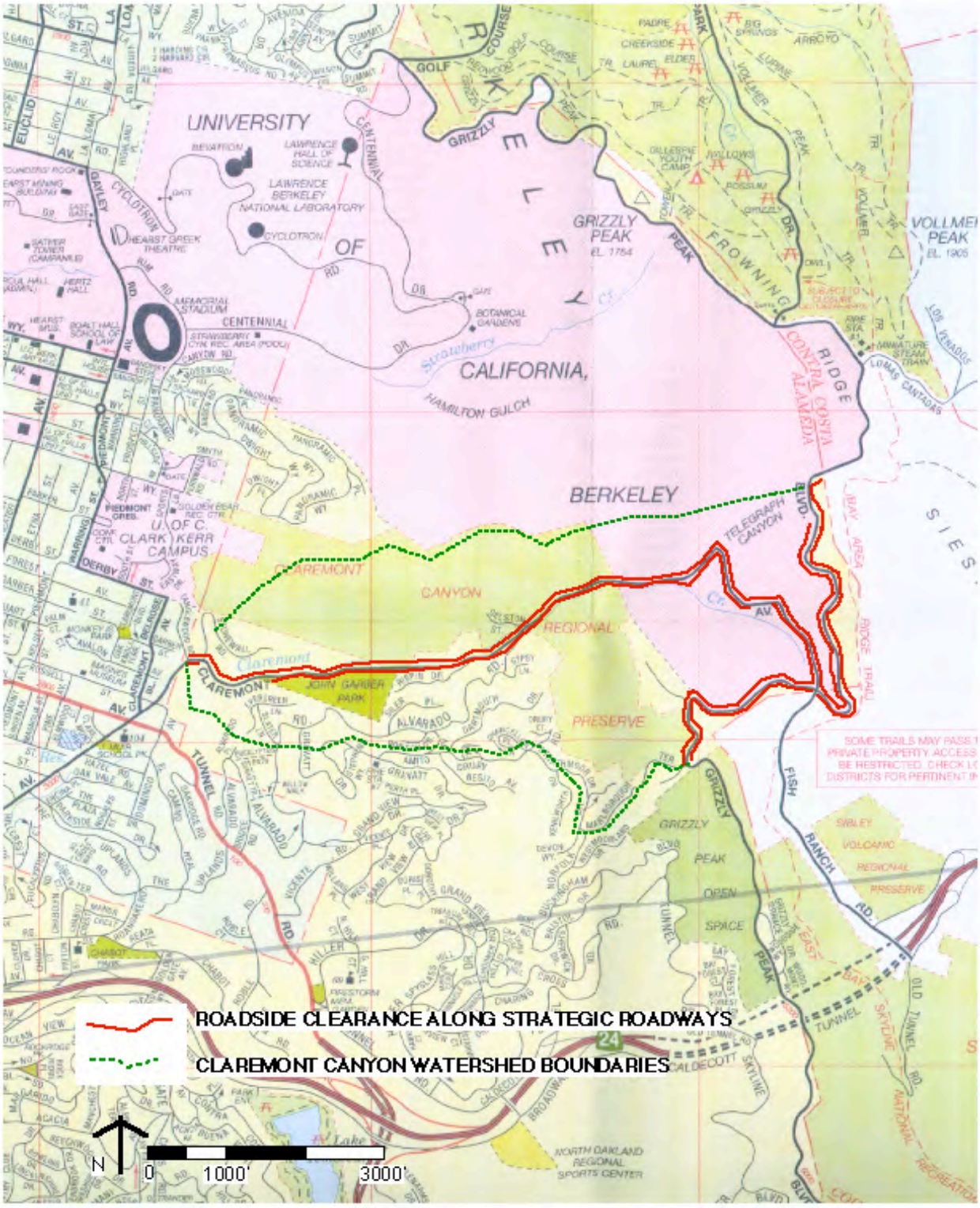

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Figure 3
Context of Map of Claremont Canyon

3. Fish Ranch Road connects to Claremont Avenue and Grizzly Peak Boulevard at the ridgeline. It provides direct connection to Highway 24 to the west. This two lane paved road does not have curbs or shoulders. The adjacent topography limits the number of turnouts.

In addition to the strategic roadways, there are many local roads that serve Berkeley and Oakland residential neighborhoods. The roadside clearance requirements in these areas are established by municipal standards. The majority of the improved roads in the canyon are located in the residential neighborhood located on the south. These roads typically follow the topography and are two lanes or narrower, with no shoulders and limited turnouts or parking areas. The network of residential streets connect to major roads in only two locations; at Marlborough Terrace and Alvarado Road.

There are also a number of fire trails in the canyon. Panoramic Way is located on the northern ridge and can be accessed through the Panoramic neighborhood adjacent to the University Stadium, and through the fire roads in Strawberry Canyon.

The south-facing slope of the canyon is an undeveloped wildland including the Claremont Canyon Regional Preserve, managed by East Bay Regional Park District, and University of California, Berkley. It was historically a mixed brush and grassland slope maintained by grazing and periodic burns. Remnant grasslands can be found along the ridge tops.

The north facing side of the canyon has been developed with homes along the ridgetops. This area was heavily impacted by the 1991 Tunnel Fire so many of the homes have been rebuilt to more firesafe building codes. Vegetation is primarily ornamental trees, shrubs and ground covers around homes. On the north slope of the canyon below the homes are undeveloped wildlands including the City of Oakland managed Garber Park and Gwinn Canyon managed by East Bay Regional Park District. Garber Park is primarily Oak woodland reflective of the moister north facing slope. Gwinn Canyon is a mosaic of moist Oak woodland on the sheltered slopes, with a mix of brushlands on the drier slopes.

Fire Management Strategy in the Canyon

The overall goals for Claremont Canyon are to enhance firefighter operations and safety through strategic fuel management. These include:

1) improve safety of public and emergency personnel by removing vegetation with potential to obstruct roadway (e.g. falling trees), cause flame impingement or extreme heat on roadway.
2) reduce roadside ignition potential,
3) support the development of fire management units in the canyon with sheltered fuelbreaks and
4) reduce the fuel load in critical locations adjacent to the road to provide enough time for successful initial attack

These goals recognize that in severe east wind conditions the fire may not be able to be contained within the canyon. The roadsides would be managed for access and egress under these conditions. Under the more typical west wind conditions, the fuel reduction strategies will provide time for fire fighters to arrive and fight the fires.

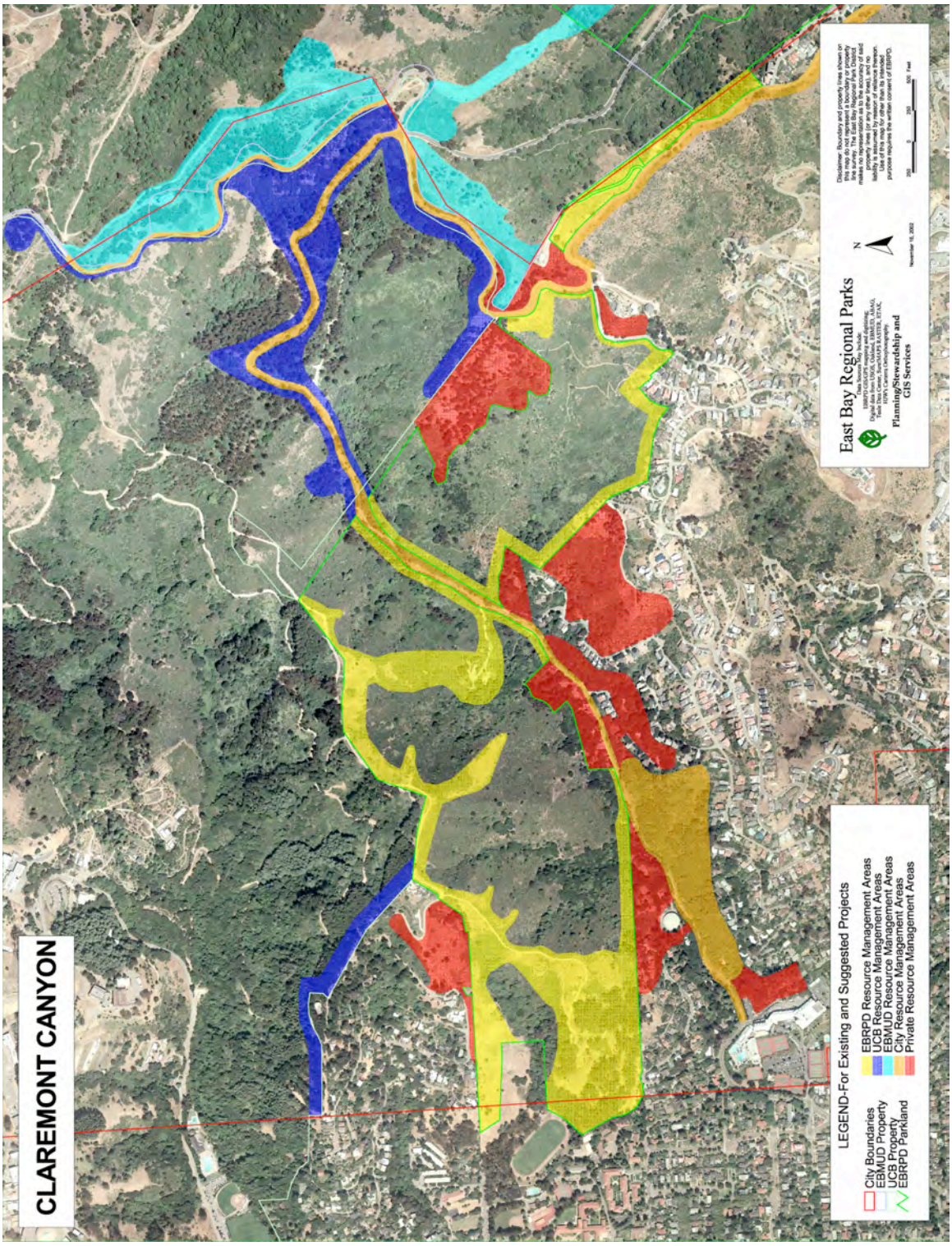

Figure 4
Treatment Areas in Claremont Canyon

Treatment Strategies

Treatment strategies have been developed based on the conditions found along the corridor and are shown in the following photo series. Each year a multi-agency team will inventory the area and establish an annual work plan that identifies and prioritizes the fuel modification projects for the following year's budget cycle.

The general treatments have been established as the following:

Roadside Clearance Standard:

Adopt as a regional standard Section 17 of the Uniform Fire Code Division II Environmental Hazard Controls, Appendix II-A Suppression and Control of Hazardous Fire. (paraphrased)

> The Chief may remove and clear within 10' on each side of roadway all flammable vegetation or other growth. May enter upon private property to clear. Does not apply to single specimens of trees, ornamental shrubbery or cultivated groundcovers provided that they do not form a means of readily transmitting fire. "Roadway" applies to portion of highway or private street improved or ordinarily used for vehicular traffic. This section also enables the chief to require reasonable alternatives measures.

Along the three major roadsides the flashy grasses and other small easily ignited materials (1 hour fuels) with be treated on an annual basis for 10' from the pavement edge. This treatment is aimed at reducing roadside ignitions.

Additional Fire Mitigation Strategies

Roadside clearances shall be supported by additional fuel modifications established on project specific basis based on site conditions, fire behavior and suppression strategies. Strategies to be considered include:

1) Provide for safety of public and emergency personnel by removing vegetation with potential to obstruct roadway (e.g. falling trees), cause flame impingement or extreme heat on roadway.
2) Protect values at risk (homes, offices, critical infrastructure etc.) with vegetation modification.
3) In strategic areas, where highly flammable brush or Eucalyptus trees are adjacent to the road, establish additional sheltered fuel break that will generate less than eight-foot (8') flame lengths at the roadway to reduce heat output and support direct firefighting attack.
   - 3a. Remove the shrubs (10 hour fuels) to create an open mosaic of grassland and less than 30% shrub density.
   - 3b. Remove any ladder fuels beneath the Eucalyptus trees (loose bark and low hanging branches) to 10 feet.
   - 3c. Dense stands of Eucalyptus along the road will have trees removed to thin the stand with a long-term goal of phased elimination.
   - 3d. The understory of native Oaks, Bays and other trees may also need to be treated to reduce their potential for a crown fire.
   - 3e. Trees, ornamental shrubbery and cultivated ground covers that do not form a means of readily transmitting fire shall be retained.
4) Modify vegetation to create potential containment areas taking advantage of existing roads and topographic features.
5) Where appropriate, incorporate safety zones for firefighters by modifying additional vegetation to reduce the flame length and heat output.

Treatment Strategies

Oak Woodland on Moist Slopes and Riparian Corridor

Along Claremont Avenue near the bottom of the canyon. Claremont Creek in culvert on left.

Moist oak woodland slope with understory ferns and herbaceous plants.

Evaluate for safety of public and emergency personnel by removing vegetation with potential to obstruct roadway (e.g. falling trees), cause flame impingement or extreme heat on roadway.

No Hazard Reduction Needed.

Along Claremont Avenue near the bottom of the canyon. Claremont Creek or right.

Riparian corridor on right side of picture. Willow and other streamside vegetation.

Treat grassy road edge on top of bank only. Do not treat creek area.

Evaluate for safety of public and emergency personnel by removing vegetation with potential to obstruct roadway (e.g. falling trees), cause flame impingement or extreme heat on roadway.

Rocky Steep Slopes with Thin Soil

Grizzly Peak north of Claremont Avenue.

Steep rocky slopes with thin soil and little vegetation.

Treat only flashy grass fuels at toe of slope. Do not disturb shrubs or other vegetation that helps stabilize the slope.

Evaluate for safety of public and emergency personnel by removing vegetation with potential to obstruct roadway (e.g. falling trees), cause flame impingement or extreme heat on roadway.

Grizzly Peak near Marlborough Terrace.

Steep rocky slopes with thin soil and little vegetation.

Treat only flashy grass fuels at toe of slope. Do not disturb shrubs or other vegetation that helps stabilize the slope.

Evaluate for safety of public and emergency personnel by removing vegetation with potential to obstruct roadway (e.g. falling trees), cause flame impingement or extreme heat on roadway.

Brush & Scrub Dominant

Dry North Coast Scrub and French Broom

Lower Claremont Avenue near homes

Mixed shrub including French broom, coyote brush and blackberry.

Treat to break up continuity and reduce overall fuel load.

Evaluate for safety of public and emergency personnel by removing vegetation with potential to obstruct roadway (e.g. falling trees), cause flame impingement or extreme heat on roadway.

Grizzly Peak Drive north of Claremont Avenue near Chaparral Hill.

Dense stand of mature coyote brush.

Treat to break up continuity and reduce overall fuel load.

Evaluate for safety of public and emergency personnel by removing vegetation with potential to obstruct roadway (e.g. falling trees), cause flame impingement or extreme heat on roadway.

Along Grizzly Peak north of Claremont Avenue.

Dense stand of mature coyote brush downslope from road. Slope > 30%.

Treat to break up continuity and reduce overall fuel load. Treatment should knock down or cut off tops of shrubs. To help maintain slope stability, do not disturb rootballs or remove entire plant.

Evaluate for safety of public and emergency personnel by removing vegetation with potential to obstruct roadway (e.g. falling trees), cause flame impingement or extreme heat on roadway.

Second Growth Eucalyptus Forest

Treated Eucalyptus stand.

No further hazard treatment needed.

Evaluate for safety of public and emergency personnel by removing vegetation with potential to obstruct roadway (e.g. falling trees), cause flame impingement or extreme heat on roadway.

Second growth Eucalyptus stand.

Treat to remove ladder fuels and reduce overall stand density.

Evaluate for safety of public and emergency personnel by removing vegetation with potential to obstruct roadway (e.g. falling trees), cause flame impingement or extreme heat on roadway.