

EAST BAY REGIONAL PARK DISTRICT
FIRE DEPARTMENT



**REDWOOD PARK
PRESCRIBED FIRE
AND
SMOKE MANAGEMENT PLAN**



February 9, 2012

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Section 1. REVIEW AND APPROVAL

Prepared By:

_____ Fire Officer East Bay Regional Park District	_____ Signature	_____ Date
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Technical Review By:

_____ Stewardship Manager East Bay Regional Park District	_____ Signature	_____ Date
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_____ Park Operations Chief East Bay Regional Park District	_____ Signature	_____ Date
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_____ Biologist East Bay Regional Park District	_____ Signature	_____ Date
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As requested under Section 5-408.1 h., I certify that the proposed burning described in this plan is necessary to achieve the specific management objectives of the vegetation management plan.

Approved By:

_____ Fire Chief East Bay Regional Park District	_____ Signature	_____ Date
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_____ Fire Chief CAL FIRE	_____ Signature	_____ Date
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Section 2. BURN UNIT DESCRIPTION

The project is located entirely within the boundary of Redwood Regional Park, located in western Contra Costa County, bordering the eastern edge of the City of Oakland. The site is within State Responsibility Area lands and primary wildland fire suppression responsibility lies with the California Department of Forestry and Fire Protection (CAL FIRE). The East Bay Regional Park District Fire Department provides a strong secondary wildland fire response in support of CALFIRE.

Coordinates: Section 34, Township 1S, Range 3W
 Latitude N 37.8 degrees, Longitude W 122.167 degrees
 2005 Thomas Guide Map: Alameda County, map page 650, H4 and J4

The project is approximately 30 acres of predominantly brush and grassland understory with a mature Monterey pine overstory. Burn unit boundaries will be enhanced using a combination of existing fire roads, temporary control lines, wet lines, hose lays, and firing methods. Elevations range from 1100 feet at the lowest point to 1400 feet at the highest, with slopes up to 40% in the steepest areas. Slopes are generally southwest facing, with some slopes facing other directions. Access for the burn area is along East Ridge Trail fire road from Skyline Gate in Redwood Park. Because East Ridge Trail is used heavily by the public throughout the day and pallid Manzanita occurrences are located adjacent to the planned burn unit, extra pre-burn considerations will be put into place, as described in Section 8.

Section 3. FUEL LOADING AND DEAD FUELS

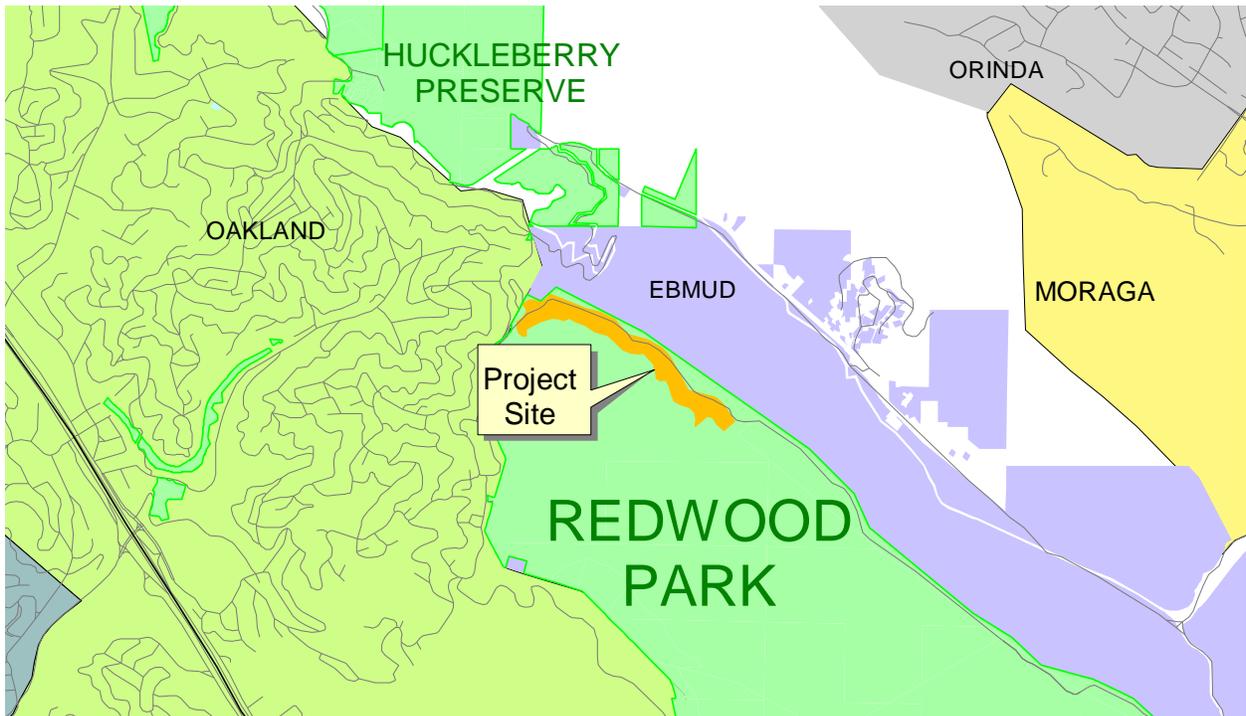
The entire burn project will be a combination of 1) grassland/herbaceous fuels and 2) grassland/herbaceous fuels with pine needle duff and dead and down branches under 1 inch diameter, estimated to average 1 ton per acre and 4 tons per acre, respectively. Fuel load estimation was derived using Park District’s historical data and the fuel model descriptions and tables listed in the “Aids to Determining Fuel Models For Estimating Fire Behavior” National Wildfire Coordination Group Publication Report INT-122 (Anderson 1982). The table below summarizes the vegetation and fuel types present to carry the fire when the project is in prescription.

Vegetation Type	Fine Herbaceous	Herbaceous with pine needle duff and dead branches under 1 inch diameter
% of unit	20%	80%
National Fire Behavior Fuel Model	1	2
Vertical Arrangement	4” to 18”	4” to 18”
Horizontal Continuity	Uniform, dense	Dense within clusters

Acres	6	24
Tons/acre	1	4

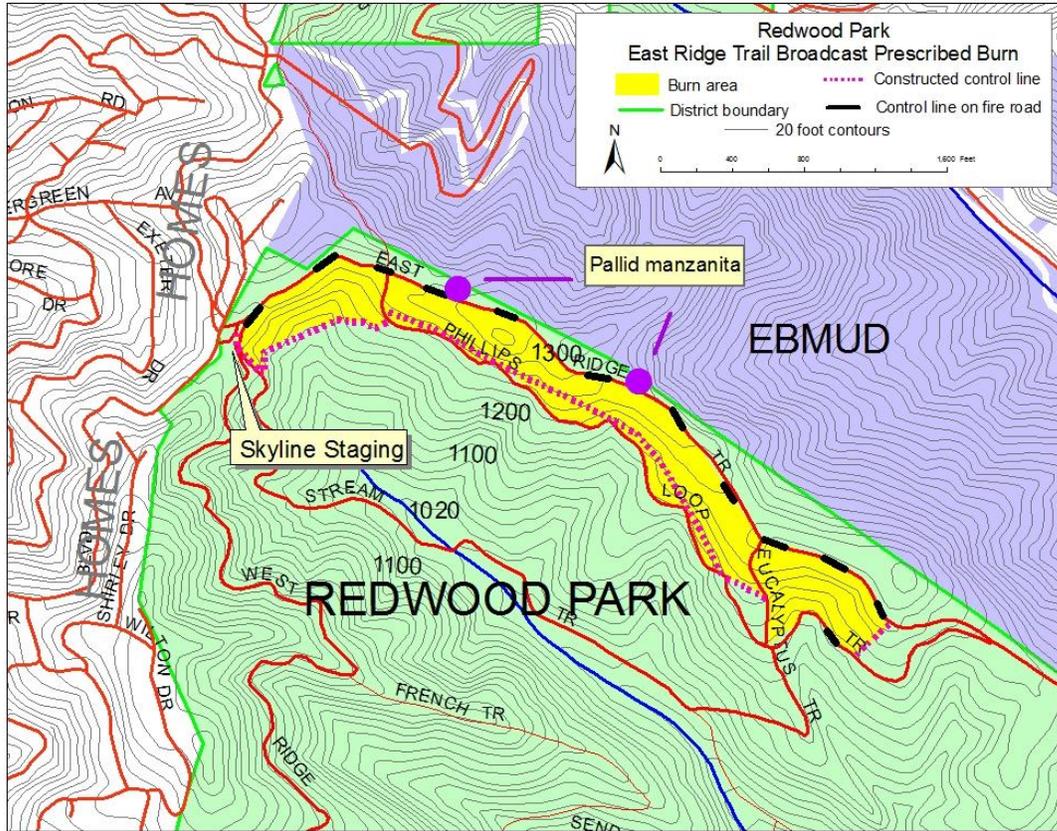
Section 4. VICINITY MAP

The map below shows Redwood Regional Park and the specific project site in relation to the surrounding areas.



Section 5. PROJECT MAP

The project map below shows the specific site location, fire roads, and incident-related features.



Section 6. LAND MANAGEMENT GOALS AND OBJECTIVES

The project goals and objectives of this vegetation management prescribed burn are to complete and maintain a key link in the interagency fuel break system designed to reduce the threat of property damage, personal injury, and other impacts to public health and safety caused by future fires in the East Bay Hills. The prescribed burn is required to create defensible space and safe firefighting access routes (East Ridge Trail) to better protect the urban/wildland interface.

Section 7. SCHEDULING

This burn project can be conducted when the grass has cured and is able to carry the fire or the pine needles and other dead fine fuels are dry enough to carry the fire, but before the 10-hour time lag dead fuels drop below approximately 15% fuel moisture content and while live fuel moisture content is still over 90%. This is most likely during late spring or early summer, but is not restricted to those periods. The burn project may also be conducted during the late fall or early winter when herbaceous fuels can still carry the fire but live and dead fuel moistures have risen. The scheduling window will be from January 1 through December 31, 2012. Burning during this window will not occur unless conditions are safe and in prescription (Section 9).

In an effort to minimize daily and cumulative air quality impact to the regional area, the project will be scheduled in coordination with Bay Area Air Quality Management District (BAAQMD) and other local agency prescribed fire projects. This project will be divided into smaller units to facilitate management and control. This project is expected to take two to three full days under favorable conditions to complete. Units that are not burned during the same day will be treated as separate burns throughout the notification process. The actual burn dates and acreage burned will be reported to BAAQMD.

This prescribed fire and smoke management plan will be submitted to BAAQMD and CALFIRE as a Wildland Vegetation Management Burn under Section 408 of Bay Area Air Quality Management District Regulation 5. The project will be conducted on a permissive burn day and in compliance with Regulation 5. For each burn day, final allowable burning acreage will be allocated by BAAQMD.

Section 8. PRE-BURN CONSIDERATIONS

Prior to any burning, any eucalyptus trees and brush within the burn area that pose a fire control hazard will be removed or reduced. In addition, the upper control line that parallels the East Ridge Trail will be enhanced and opened up by thinning out some of the small diameter, sapling-sized Monterey pine trees on the site. Hand tools will be used to establish control and containment lines at the bottom of the site where no trails or fire roads exist. All temporary control lines, if necessary, including wet lines and black lines, will be established during the burn.

Personnel will be assigned to monitor weather readings in the field prior to burning and once every hour during the burn until deemed no longer necessary by the Incident Commander. The information will be recorded and monitored to document fire weather, changes in smoke dispersal patterns, and fire behavior observations. In addition, the nearest RAWS station, Oakland South (OSO) will be monitored for 1 week prior to the burn to observe 10 hr TL fuel moisture, relative humidity, wind speed and direction, and air temperature.

At least one week prior to the burn, signs will be posted at the entrance to the East Ridge Trail at Skyline Gate to let users know that a broadcast burn will be occurring. The District's website will also provide notice. Signs will also be posted at the eastern end of East Ridge Trail and at Huckleberry Staging. East Ridge Trail will be closed to the public during the burn days until such time it is safe and free of smoke.

Three days before each planned burn day, BAAQMD's meteorologist (415-749-4915) will be phoned to obtain the 72-hour weather forecast and outlook. Likewise, the request for BAAQMD's 48-hour forecast and outlook will be made two days before each burn day. On the day before each burn day, a 24-hour forecast will be requested and BAAQMD will provide a final "go" or "no go" for the burn project. On the morning of the burn, all notifications, as described in Section 15, will be performed before any burning operation. This includes the call made to BAAQMD to obtain acreage allocation. News releases and information flyers will be prepared and distributed as necessary. Prescribed fire signs will be set up at the entrance gate on the morning of the burn.

Special considerations for sensitive native plant and wildlife species have been established for this fuels management area as part of the District’s Wildfire Hazard Reduction and Resource Management Plan and within the body of the fuels management prescription written for site RD001. The District’s Stewardship Department will be consulted with prior to burning to ensure resource objectives such avoiding disturbance to bird nesting, Oakland star tulip, pallid Manzanita, Alameda whipsnakes, wood rat nests, native tree understory, as well as limiting control line construction through streams. Pallid Manzanita occurrences are documented north of the burn site but outside the perimeter, as shown in the map in Section 5.

Section 9. BURNING PRESCRIPTIONS

The table below summarizes the weather and burning characteristics necessary to stay in prescription. Observed conditions will be recorded and documented.

Weather	Range	Optimum
Temperature (F)	40-85	70
Relative Humidity (%)	25-75	35
Wind Direction (azimuth)	From 180-360	W or SW
Mid Flame Wind Speed (mph)	0 - 7	5
Minimum Upper Level Wind Speed (mph)	20 mph or greater	15
Minimum Mixing Height (ft)	500 ft or higher	NA
Fuel Moisture 1 hour (%)	3-10	6
Fuel Moisture 10 hour (%)	6-20	11
Live Herbaceous Moisture (%)	90 to 120%	100%
Days Since Last Rain	5 - 30	10

Characteristics	Range	Optimum
Rate Of Spread (chains per hour)	2.5 - 40	25
Flame Length (ft)	2 – 7.5'	6'
Burning Index	20 - 75	60

Section 10. FIRING TECHNIQUES AND HOLDING METHODS

A small test ignition at the burn site will be conducted with a drip torch to observe ignition and combustion rates on the morning of the burn. Strip, head firing, and backing fire ignition patterns will be used to ignite the unit. Ignition devices will include fusees, pen flares, Very pistols, and drip torches. Strip head fires will be used whenever possible. Firing patterns and directions could change depending on wind direction, other weather parameters, or smoke management concerns. Holding crews will be in place to set the pace of the firing crews and to ensure that no fire crosses the control line. Control lines will be established using existing fire roads, trails, and any natural features where feasible. Specifically, the East Ridge Trail will form the uppermost control line. Phillips Loop Trail will serve as the lower control line. In addition, a combination of handlines, wet lines, hose lays, mobile attack lines, and firing methods may be used for fire control. Water sources include the 1800 gallon water tender and fire hydrants located within 2 miles of the project north along Skyline Blvd. Duration of project ignition will last approximately 1 to 5 hrs for each plot depending on burning conditions and plot size. Combustion and burn down time will be minimal in the grassland due to the light flashy fuels. The ignition period will generally be between 1000 and 1500 hrs, but will not be before 1000 or after 1500 hrs. All fire will be completely extinguished by the end of each project day.

Section 11. ESCAPED FIRE CONTINGENCY PLAN

The Escaped Fire Contingency Plan below will be included in the Incident Action Plan.

The Stream Trail and Eucalyptus Trail will both serve as contingency control lines and provide access for contingency control resources.

In the event of a significant escape, medical, or off-site emergency, the Incident Commander will be notified and all on-site personnel will be notified.

Upon notifications, all firing will be suspended, unless the Operations Section Chief determines that continued firing will assist the control of the escape or will not inhibit control actions.

Uncommitted units will stage for assignment.

The Incident Commander or Operations Section Chief will conduct a roll call to ensure all units are notified. The Incident Commander will advise EBRPD Dispatch of the escape and of actions to contain it.

The Incident Commander will request additional resources as needed through East Bay Regional Parks Fire Department (EBY) Dispatch/Communications Center. The EBY Communications Center will notify Oakland Fire, Contra Costa County Fire, EBMUD, and CALFIRE Morgan Hill of the escape. Minimum number of resources requested is

four type III engines.

Upon successful handling of the emergency, all units will be notified and the prescribed burn will resume if appropriate.

Section 12. WEATHER INFORMATION

At least 72 hours before the planned burn day, weather forecasts will be obtained from BAAQMD meteorologists and the National Weather Service. Additional information regarding local weather and wind speeds will be obtained from the nearest RAWS station, at Oakland South, from various weather related web sites such as (www.nws.noaa.gov), (www.wrh.noaa.gov/mtr/fireweather.php), and local news media forecasts. A site-specific (spot) weather forecast will be requested from NWS 24 hours before the burn day. During the burn, weather will be monitored and observed. Ignition operations may be modified or suspended if there are significant adverse changes in the weather, especially due to frontal passages, strong winds, or decrease in relative humidity.

Section 13. SMOKE MANAGEMENT

Smoke volume from the project should not have a significant impact upon the surrounding communities due to the distance of the project from developed areas. Burning under wind conditions specified in the prescription will mitigate adverse smoke impacts. Smoke dispersal conditions will be evaluated in the morning prior to ignition and continually during the burn. Personnel will be assigned to patrol and observe smoke dispersal as necessary. If available, the Park District’s helicopter will be used as an observation platform to assist with monitoring smoke dispersion criteria.

This project will be conducted in a manner that will avoid a significant smoke intrusion into any smoke sensitive area. In the event a smoke intrusion does occur in a smoke sensitive receptor, the following action will be taken to reduce smoke production if appropriate:

- * Reduce the size of the burn plot by developing new control lines
- * Suppress active fire
- * Initiate mop up operations
- * Focus suppression and mop up operations on areas of greater smoke production

Strip, head firing, and backing fire ignition patterns will be used to ignite the unit. Strip head fires will be used whenever possible. Firing patterns and directions could change depending on wind direction, other weather parameters, or smoke management concerns. Smoke emission and behavior will be continually monitored visually. All personnel on scene will be instructed to report any observed smoke impacts or significant change in smoke emissions and/or column behavior to the Incident Commander. The Incident Commander will manage the project in a manner that will minimize smoke production and the impact to sensitive areas. The project size, number of plots burned, firing tactics and burn duration will be adjusted to meet these goals. The table below lists

developed areas (direction and distance) surrounding the project area.

Nearest Smoke Sensitive Receptor	Distance (miles)	Direction (Azimuth from project)
Oakland	0.25 to 0.75	180 to 360
Orinda	1.0 to 1.5	45
Moraga	1.5	90

During the burn, on-site monitoring will be conducted and information will be collected regarding weather, smoke, and fire behavior observations. Estimated mixing heights and upper level smoke transport winds will be obtained the day before the burn from the Northern California Geographic Area Coordination Center Internet site (<http://gacc.nifc.gov/oncc/predictive/weather/fwlrdd2.html>).

The estimated total particulate matter emission (PM 10) for this project is **0.909** tons, calculated using the formula:

$$\text{PM 10 Emissions tons} = (\# \text{ acres of veg type}) * (\text{fuel load in tons/acre}) * (\% \text{ combustion}) * (\text{PM 10 emission factor in lbs/ton}) * (\text{conversion factor of 1 ton/2000 lbs})$$

The combustion value of 100% and PM 10 emission factor of 15 lbs/ton for hardwoods and for grass/forbs was based on the USDA Table 8 of the “Air Quality Conformity Handbook - A Handbook for Land Managers”, USDA Forest Service, Air Resources/Fire Management, Pacific Southwest Region (November, 1995), available at (<http://www.arb.ca.gov/smp/techttool/emfac.htm>).

Grassland with litter - PM 10 emission:
 $(24 \text{ acres}) * (4 \text{ ton/acre}) * (90\% \text{ combustion}) * (20 \text{ lbs/ton}) * (1 \text{ ton/2000 lbs}) = 0.864 \text{ tons}$

Grassland - PM 10 emission:
 $(6 \text{ acres}) * (1.0 \text{ ton/acre}) * (100\% \text{ combustion}) * (15 \text{ lbs/ton}) * (1 \text{ ton/2000 lbs}) = 0.045 \text{ tons}$

Total PM 10 emission:
 $0.864 + 0.045 = \mathbf{0.909 \text{ tons}}$

Section 14. MEDIA COORDINATION AND PUBLIC INVOLVEMENT

A news release will be prepared three days prior to the burn. Informational flyers will be distributed to the nearby residents as necessary. Nearby residents smoke sensitive facilities (schools, businesses etc.) that could be affected by the smoke will be notified. The East Bay Regional Park District

Public Information Officer will see that the press release is distributed to the media 1 to 2 days prior to the anticipated ignition date. Trail Patrol Volunteer staff will be stationed at key entry points in the project area to restrict trail access to park users. Prescribed fire signs will be set up at the entrance gate on the morning of the burn.

Section 15. NOTIFICATIONS

The following agencies/personnel will be notified by the Incident Commander on the morning of the burn:

Bay Area Air Quality Management District (415) 749-4600 (after 8:30 am for acreage allocation)
EBMUD Watershed Headquarters (510) 287-0459
EBRPD Stewardship Staff (510) 544-2346 or (510) 544-2343
EBRPD Public Information Staff (510) 544-2208
EBRPD Dispatch Center (510) 881-1833
EBRPD Main Switchboard Operator 1-888-EBPARKS (0 for Operator)
EBRPD Park Operations (510) 544-2500
EBRPD Redwood Staff (510) 482-6024
EBRPD Parklands Unit Office (510) 482-6025
Chabot Space and Science Center (510) 336-7300
Neighborhood CORE leaders: Toni Walchek 510-531-8636
and Ron Barklow 510-531-0260
EBRPD Dispatch Center (510) 881-1833 (Tell them to fax a checked copy of the GO/NO GO checklist to CAL FIRE at 408-778-6149)

The following agencies/personnel will be notified by the EBRPD Dispatch Center on the morning of the burn:

CAL FIRE Emergency Communication Center (408) 779-6611 (Tell them to notify Lookouts/Air Attack Bases and Region ECC/Duty Chief)
Contra Costa County Fire Dispatch (925) 930-5500 or (925) 933-1313
CHP 911 center (707) 551-4100
Oakland Fire (510) 444-3322

Section 16. PUBLIC AND PERSONAL SAFETY

During the burn operation, safety is the primary consideration and will be stressed to all personnel on scene during the pre-burn briefing. Any special safety instructions will be included in the Incident Action Plan. A safety officer will be assigned for the entire burn operation and will be responsible for communicating any safety-related issues to the Incident Commander and personnel. Good communications will be required at all times and outlined in the Incident Action Plan. All personnel on the burn will meet the minimum Firefighter I qualifications and will wear full firefighting

personal protective equipment, including nomex, hardhat, gloves, boots, and fire shelter.

Section 17. MONITORING AND EVALUTION PROCEDURES

On-site monitoring will be conducted during the burn to observe weather, burning conditions, and smoke behavior, as outlined in Sections 11, 14, and 15. Biologists will be on scene within 24 hours after the burn to assess any impacts on wildlife or plants.

Section 18. REHABILITATION

There are no expected rehabilitation procedures necessary for this burn project. If control lines are established through tributary streams or other areas where unacceptable erosion may occur, appropriate erosion control measures will be installed.

Section 19. POST-PROJECT REPORTS AND CORRESPONDENCE

Within 30 days after completion of the burn project, a post burn report will be provided showing the total acreage, volume, or tonnage of vegetation actually burned. Included in the report will be a list of all personnel and apparatus at the burn and the total costs and cost per acre for the project. The report will be submitted to the Chief of the East Bay Regional Park District Fire Department. Also, copies of the following documents will be attached to the report (Appendix III):

- *CAL FIRE approval letter or permit
- *BAAQMD approval letter
- *Prescribed Burn notification flyer
- *Any additional correspondence related to the burn project

As per Regulation 5, 408.4, BAAQMD will be notified of actual acres burned before 12:00 on the day after each burn day. Per Section 408.5, a post-burn evaluation will be submitted to BAAQMD within 30 days of the completion of the project.