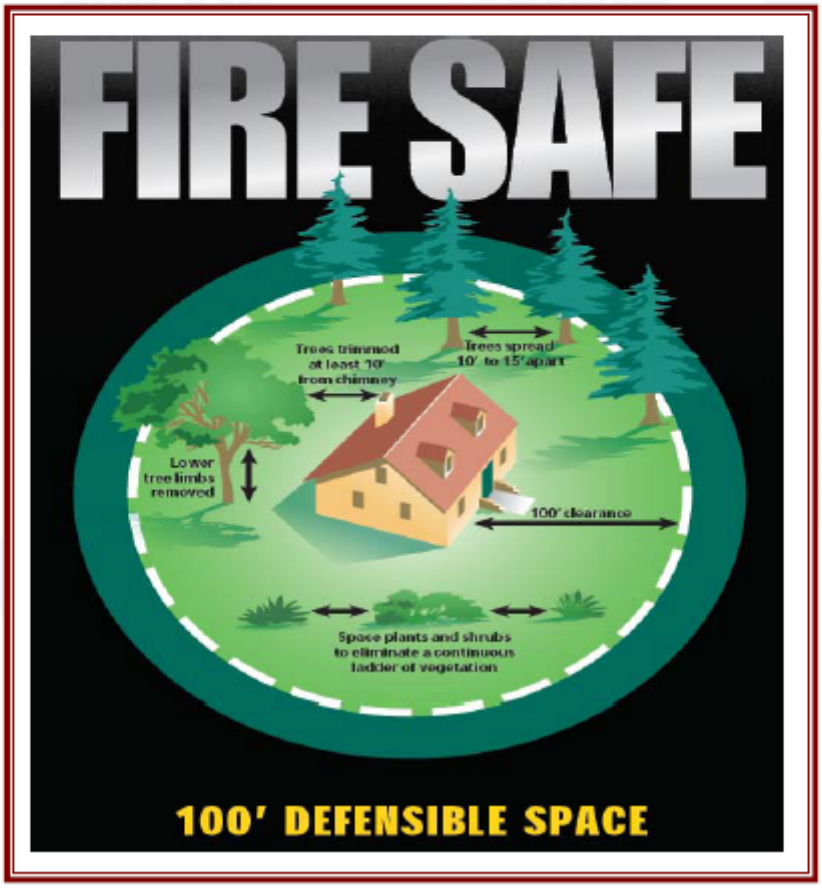
CALIFORNIA DEPARTMENT OF
FORESTRY AND
FIRE PROTECTION

SAN BERNARDINO

2005

UNIT FIRE PLAN



SAN BERNARDINO UNIT

July 1, 2005

PLAN APPROVAL

BOB GREEN, UNIT CHIEF DATE

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EXECUTIVE SUMMARY

FIRE PLAN CONCEPT AND PROCESS

The State Board of Forestry and Fire Protection and the California Department of Forestry and Fire Protection (CDF) have drafted a comprehensive update of the fire plan for wildland fire protection in California. The planning process provides for public stakeholder involvement, incorporates the cooperative interdependent relationships of wildland fire protection providers, considers assets at risk, defines a level of service measurement, and creates a fiscal framework for policy analysis.

The San Bernardino Unit is and has been actively engaged with local stakeholders and public agencies in the development of Community Wildfire Protection Plans (CWPP). Extensive collaboration of all involved entities has resulted in significant progress toward the goal of having all at risk communities complete their CWPP See Appendix #3.

GOAL AND OBJECTIVES

The overall goal of the San Bernardino Unit Fire Plan is to reduce total costs and losses from wildland fire in the Unit by protecting assets at risk through focused prefire management prescriptions increasing initial attack success and through engaged collaboration with local stakeholders and public agencies.

The San Bernardino Unit Fire Plan has five strategic objectives:

1) To create wildfire protection zones that reduces the risks to citizens and firefighters.

2) To assess all wildland areas, not just the state responsibility areas. The analysis will include all wildland fire service providers - federal, state, local government, and private.

3) To identify and analyze key risks and issues so that recommendations for changes in public policy may occur.

4) To have a strong Unit fiscal policy focus in order to affect the maximum of available funding sources for wildland fire protection projects.

5) To translate these analyses into “on the ground” accomplishments by focused collaboration efforts with public and private partners..

FIRE PLAN FRAMEWORK

Five major components will form the basis of an ongoing fire planning process to monitor and assess the San Bernardino Unit's wildland fire environment:

1) **Wildfire protection zones.** Areas of low fire risk intended to buffer communities from devastating wildfire.

2) **Initial attack success.** Measurements of the percentage of fires that are successfully controlled before unacceptable costs are incurred. This measure can be used to assess the department's ability to provide an equal level of protection to lands of similar type.

3) **Assets protected.** The assets addressed in the plan are citizen and firefighter safety, watersheds and water, timber, wildlife and habitat (including legally protected species), unique areas (scenic, cultural, and historic), recreation, range, structures, air quality.

4) **Prefire management.** This aspect focuses on evaluating which prefire activities to best protect assets from wildland fires. Specific themes of these activities include the Unit fire prevention collaboration at every opportunity, management of fire-prone vegetation, the management of fire ignition sources, fire prevention enforcement and education, and implementation of fire safe concepts in all existing and planned urban areas at risk from wildfire.

5) **Fiscal framework.** A framework to evaluate and insure that the most cost-effective means are being used to protect assets from wildfire.

STATUS OF FIRE MANAGEMENT IN THE SAN BERNARDINO UNIT

- Components of the San Bernardino Unit's Fire Plan process are being evaluated and verified using computer models, field surveys, community stakeholder involvement and historical data.

- Ten Fire Safe Councils exist within the Unit. Planning projects range from community clean-up days to fuel break improvements. Significant vegetation mortality resulting from six years of sustained and record setting drought and bark beetle infestation has increased the fire danger throughout the Unit but most significantly in the mountain communities. The Fire Safe Councils have been instrumental in, project implementation community outreach, public information, as well as representing the public on the Mountain Area Safety Taskforce (MAST) and support of CDF with it's efforts to get increased awareness of fire safety.

- Annual fire safe inspections are being conducted. Engine companies are conducting LE 38 inspections. An effort is being made to have engine companies make face to face contact with every homeowner in the highest risk areas that are experiencing the greatest degree of vegetation mortality. Additionally, due to the significant increase in timber removal operations, commercial operations have been targeted as presenting a greater than average threat of causing an ignition. All MAST agencies are being instructed in what fire prevention/safety requirements that CDF, local San Bernardino county fire districts and the US Forest Service require.

- Traditional fuel modification through a Vegetation Management Program (VMP) has not been successful due to the high number of threatened and endangered species listed by the U.S. Fish and Wildlife Service (FWS). FWS has been unsupportive of prescribed burning citing concern that habitat will be converted as a result.

- Considerable collaboration has occurred with the Forest Service and CDF regarding preliminary hazardous fuel modification project planning with "Teams Enterprise". "Fireshed" analysis of potential project sites in the Oak Glen area, with extensive involvement from local area stakeholders, has resulted in considerable progress toward development of a final fuels treatment plan. On the ground fuel work could begin as early as late 2005, to include a wide variety of treatments over a large landscape of federal and state responsibility area surrounding the Oak Glen community.

- The San Bernardino Unit in collaboration with the Inland Empire Fire Safe Alliance has submitted a request for a Fire Assistance grant in the amount of $4.0 (from a total of 4.9m) available from the Department of Agriculture, United States Forest Service for the San Bernardino National Forest area. Funds will be granted to The California Department of Forestry and Fire Protection (CDF) and the Inland Empire Fire Safe Alliance (IEFSA) for the development and implementation of an incentive program for the thinning of pre-commercial, green trees on private, residential, forested lots. The program is designed to provide a financial incentive to private landowners within this highly urbanized National Forest and on parcels less than 5 acres to reduce hazardous fuels and promote a healthy forest. Priority will be given to landowners whose property lies within ¼ mile of the boundary of the National Forest boundary. See Appendix #2.

- Last year four additional CDF augmentation engines were added to the Unit's normal engine allotment. The engine companies were housed at fire stations in cooperation with local fire protection districts in order to enhance the initial attack capability on all types of uncontrolled fires on SRA in the San Bernardino Mountains. Additionally, two CDF fire crews have been added to the Unit's complement of available crews, one at Fenner Camp and one at Oak Glen Camp.

- Fuel reduction is being carried out in support of the San Bernardino Sheriff's Evacuation Guideline for the Mountain Communities version 6.0 and several community fire defense projects in the Crestline, Lake Arrowhead and Big Bear areas.

- Fuel break and fire access road improvements, points of refuge and essential service sites have been identified for enhanced protection, prioritized and scheduled under MAST coordination, per the Incident Action Plan.

- Public education programs are being conducted to promote fire safety from a pre-fire management/fire prevention perspective. In June of last year, an updated version of "Living with Wildfire in the Inland Empire" was released in the San Bernardino Sun newspaper and four other local newspapers. Over 140, 000 have been circulated and an updated version of this publication is in the works for next year. This insert is also available on line at www.sbsun.comT.

- Unit Fire Prevention staff in cooperation with Southern California Edison are conducting inspections of electrical utility lines for compliance with clearance and maintenance regulations throughout the Unit. Enhanced Forest Practice Act law enforcement inspections are underway due to the huge increase of dead, dying and diseased tree cutting activity by Southern California Edison and other private contractors in the San Bernardino mountains.

- San Bernardino Unit personnel are assisting the Inland Empire Fire Safe Alliance and other Fire Safe Councils with the development of Community Wildfire Protection Plans (CWPP) in support of their efforts to obtain federal fire prevention assistance funding. These efforts are also showing positive results with regard to public awareness of the wildland fire risks in their communities.

- Unit personnel, in collaboration with Environmental Systems Research Institute (ESRI) and CDF's Fire Resource Assessment Program (FRAP) have contributed to the development of protocols and methodology for the GIS assessment of tree mortality issues in the San Bernardino Mountains.

- Cooperating with the California Biodiversity Council and other environmental organizations, San Bernardino Unit personnel are resolving issues common to environmental sensitive fuel projects.

- "Teams Enterprise", an enterprise team from the US Forest Service have been assigned to develop fuel reduction projects in the San Bernardino National Forest. Unit personnel have been asked to support proposed projects that would benefit public and private lands. Since July 2004 notable collaborative work has occurred with the US Forest Service, the Riverside and San Bernardino CDF Units, The Inland Empire Fire Safe Alliance and other public and private stakeholders. Significant fuel mitigation planning efforts have resulted in a comprehensive plan to relieve the wildland fire threat to the community of Oak Glen. See Appendix #'s 8,9,10.

- Unit personnel in collaboration with local Fire Safe Council grant funds and planning efforts have been instrumental in the establishment of community fire defense projects in the Wrightwood, Crestline, Twin Peaks Big Bear and Oak Glen areas and more are being planned throughout San Bernardino mountain communities.

- Pilot Rock Camp and Headquarters training staff have provided numerous operational and safety training sessions for local, state and federal public service personnel.

STAKEHOLDERS

A stakeholder is defined as any person, agency or organization with a particular interest - a stake - in fire safety and protection of assets from wildland fires. Fire Safe Councils are a way for stakeholders in the San Bernardino Unit to become involved in risk identification and appropriate community fire defense plans and projects.

FIRE SAFE COUNCILS IN THE SAN BERNARDINO UNIT

The Unit continues to develop Fire Safe Councils by identifying and targeting individuals and organizations with an interest in hazard reduction and fire safety. There are currently 10 Fire Safe Councils active within the San Bernardino Unit .See Appendix #3.

GOALS:

- To develop local community participation in pre-fire planning projects and events.
- To establish Fire Safe Councils with the intention of mobilizing private citizens within the communities who share a common, vested interest in wildland and urban fire prevention and loss mitigation.

Recent accomplishments include incorporation of all councils as non-profit/501c3 tax exempt entities, the final word in community fire prevention organizations in their respective communities, networking with local, state and federal agencies, as well as with other community groups with the goal of more effective citizen awareness and commitment.

Committees have been established in all 10 councils in order to explore the availability of grant money and to determine funding sources for all manner of pre-fire projects. Work progresses on pre-fire issues such as fuel modification zones, residential smoke alarms, road access identification, hazard reduction, residential housing addressing, demonstration forests, LE-38 inspections and public information and education, targeted community outreach efforts to communities interested in establishing their own fire safe councils and much more. The San Bernardino Unit has elected to support and advise Fire Safe Councils in their quest for funding. As such, Fire Safe Councils have been successful in obtaining more than $800,000 in federal National Fire Plan funding for operations, planning and pre fire projects throughout the Unit.

Community meetings are held during the year and working group meetings held constantly throughout the council areas with the goal being to increase the effectiveness of all Fire Safe Councils.

Additionally, all San Bernardino Unit Fire Safe Councils and several from the Riverside Unit have collectively organized to form the "Inland Empire Fire Safe Alliance". The goal of this organization is to further enhance the political, fundraising and on-the-ground effectiveness of all member Fire Safe Councils.

The IEFSA purpose is to:

- promote consistent and comprehensive collaborative community stakeholder messages regarding forest health and fire safe concepts to citizens
- serve as a centralized resource for literature and other media on urban wildlife interface, defensible space and forest health

- provide grant administration, writing, and reporting for those councils without the resources to perform these functions; coordinating the member councils to assist one another or contracting the professional services on behalf of the Alliance
- offer to serve as fiscal sponsor to areas without 501c3 status, if needed
- create a one-stop shop for information and research; using the existing councils and their personnel and professional resources to investigate issues and bring to the network
- develop of a monthly newsletter to member FSC's and agencies
- maintain the www.fireinformation.com website in conjunction with agency PIO's
- provide coop insurance policy for those without other insurance options
- coordinate regional contracts for equipment, labor, projects to reduce costs
- help organize community presentations, school programs, etc. for those member councils needing this assistance
- provide a "speakers bureau" drawing upon the talent and expertise of various individuals within the Alliance and its member councils
- most importantly, provide a forum for discussion of issues, challenges and successes

<u>Benefits</u>

- Agencies can contact one organization rather than 13-plus for rapid dissemination of information via email trees etc.
- Assistance to PIO's can help them prepare concise message
- Reduce council expenses due to coop agreements (i.e. insurance)
- Identification of regional projects will reduce redundancy
- FSC concept can be embraced more readily in some smaller areas by eliminating the need for individual 501c3 status for grants
- Less cost for brochure/literature printing by coop efforts and shared equipment, bulk purchases coordinated to save all member councils money (i.e. "Turboflares")
- Overall consistence in disaster prep programs and efforts - regional perspective
- Alliance has ability to switch focus to other disasters because of infrastructure
- Continuation of projects if local FSC fails in their efforts or needs administrative assistance
- Regional communication link between citizens and others

Consistency, continuity, efficiency, effectiveness, collaboration, cooperation

The success of this organization is measured easily as these cooperative operations manifest themselves in regional grants, regional projects, and regional conferences benefiting all communities, with or without a fire safe council

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ASSETS AT RISK

Assets at risk, as identified in the California Fire Plan, are listed in the table below and are considered an integral component of day to day fire protection and resource planning considerations in the San Bernardino Unit:

Asset at Risk	Public Issue Category	Location and ranking methodology
Hydroelectric power	Public welfare	1) Watersheds that feed run of the river power plants, ranked based on plant capacity; 2) cells adjacent to reservoir based plants (Low rank); and 3) cells containing canals and flumes (High rank)
Fire-flood watersheds	Public safety Public welfare	Watersheds with a history of problems or proper conditions for future problems (South Coastal Plain, field/stakeholder input), ranked based on affected downstream population
Soil erosion	Environment	Watersheds ranked based on erosion potential
Water storage	Public welfare	Watershed area up to 20 miles upstream from water storage facility, ranked based on water value and dead storage capacity of facility
Water supply	Public health	1) Watershed area up to 20 miles upstream from water supply facility (High rank); 2) grid cells containing domestic water diversions, ranked based on number of connections; and 3) cells containing ditches that contribute to the water supply system (High rank)
Scenic	Public welfare	Four mile viewshed around Scenic Highways and 1/4 mile viewshed around Wild and Scenic Rivers, ranked based on potential impacts to vegetation types (tree versus non-tree types)
Timber	Public welfare	Timberlands ranked based on value/susceptibility to damage
Range	Public welfare	Rangelands ranked based on potential replacement feed cost by region/owner/vegetation type
Air quality	Public health Environment Public welfare	Potential damages to health, materials, vegetation, and visibility; ranking based on vegetation type and air basin
Historic buildings	Public welfare	Historic buildings ranked based on fire susceptibility
Recreation	Public welfare	Unique recreation areas or areas with potential damage to facilities, ranked based on fire susceptibility
Structures	Public safety Public welfare	Ranking based on housing density and fire susceptibility
Non-game wildlife	Environment Public welfare	Critical habitats and species locations based on input from California Department of Fish and Game and other stakeholders
Game wildlife	Public welfare Environment	Critical habitats and species locations based on input from California Department of Fish and Game and other stakeholders
Infrastructure	Public safety Public welfare	Infrastructure for delivery of emergency and other critical services (e.g. repeater sites, transmission lines)
Ecosystem Health	Environment	Ranking based vegetation type/fuel characteristics

Approximately 7 billion dollars of assed valuation primarily on, State Responsibility Area (SRA), has been determined to be at severe risk in the San Bernardino mountains. After six years of below normal rainfall, unhealthy forest conditions and a huge increase of dead dying and diseased trees, virtually all assets as identified in the Fire Plan, especially private residences and businesses are at significantly increased threat of destruction by forest fire. With the extraordinarily wet winter of 2004-05, significant relief has occurred in the 100 hour and 1000 hour fuels. However, unusually heavy fine fuel growth has appeared adding an increased risk factor to all fuel types throughout the Unit.

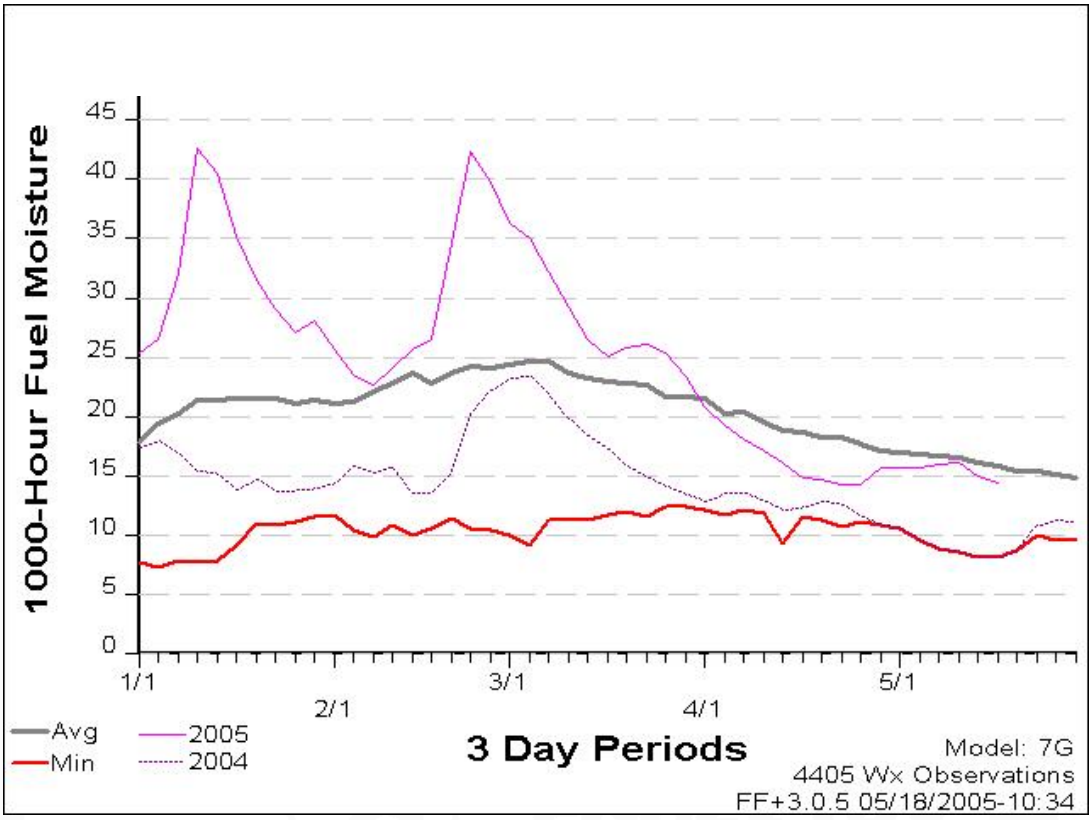
The San Bernardino Unit's response has been to markedly increase the removal of dead and dying

trees, primarily at point of refuge sites, essential service locations and along major travel routes as identified through CDF's collaborative efforts with local fire districts and the Mountain Area Safety Taskforce (MAST) organization. Additionally, the Unit has stepped up Forest Practice inspections of Licensed Timber Operators and contract tree fallers, especially with regard to required fire fighting tool availability. The Unit has been the recipient of federal Forest Health grant funding which has been used for the purchase of needed equipment and the hiring of additional foresters. All other efforts in this regard have occurred without additional staff or crew funding, but are the result of the redeployment of normally assigned Unit resources.

As part of the fire plan process, the fuels, assets at risk, past fire weather history and the level of service that CDF has provided to the public is constantly being analyzed. Data for these four components have been complied by staff in CDF's Fire and Resource Assessment Program (FRAP) in Sacramento. The second fuel analysis was completed on 2004 on CDF Direct Protection Area (DPA) lands and State Responsibility Area that is currently Federal DPA within the San Bernardino National Forest. In this document, DPA refers to CDF DPA, unless noted otherwise.

**To arrive at a common land area unit to assemble this data, US Geological Survey 7.5 minute quadrangle maps were divided by a 9 x 9 grid, forming 81 equal area blocks of land. Each block contains 450 acres and has been named a quad 81st. Data for the entire Unit has been compiled down to the quad 81st*

The winter rains of 04-05 have resulted in significant relief in 1000 hr fuel moisture content while markedly increasing the fire threat from increased fine fuel proliferation through the Unit.



SAN BERNARDINO MOUNTAINS

Wildland fuels or vegetation are the basic catalyst that supports the combustion process of wildfires. The various fuels found in California have specific characteristics, which allow fire behavior analysts to categorize them based on how they burn. The Fire Behavior Prediction System (FBPS) was the method chosen for categorizing fuels for the fire plan process. This method classifies fuels in 13 basic fuel models, each of which has specific physical and burning characteristics. FBPS are mathematical formulas that require mathematical descriptions of **fuel models** and their respective fuel properties as input. This input combined with meteorological and topographic parameters is used for calculations of fire danger and/or fire behavior.

A **fuel model** is a mathematical representation of various fuel types used in mathematical fire spread models. **Fuel models** are expressed numerically 1-13 that describe fuels in terms that spread models understand (surface area to volume ratio, fuel load, size, shape, compactness, horizontal and vertical continuity, moisture of extinction, etc.). Simply put, ***fuel models are*** *tools that help land management agencies and fire planners realistically estimate fire behavior or fire danger.*

The models include 3 grass, 4 brush, 3 timber, and 3 slash fuel types. The fire plan has labeled fuel model #2, a grass model, as a woodland fuel. This modeling system also allows the creation of custom fuel models when none of the 13 models adequately represent the fuels that are found in an area.

Custom fuel model #14 was developed for plantation/burned areas, water and rock/barren areas. Custom fuel models #15 and #28 refer to desert and urban fuels respectively. See Appendix #5.

Table 1.— Description of fuel models used in fire behavior as documented by Albini (1976)

Fuel model	Typical fuel complex	Fuel loading				Fuel bed depth	Moisture of extinction dead fuels
		1 hour	10 hours	100 hours	Live		
		Tons/acre				Feet	Percent
	Grass and grass-dominated						
1	Short grass (1 foot)	0.74	0.00	0.00	0.00	1.0	12
2	Timber (grass and understory)	2.00	1.00	.50	.50	1.0	15
3	Tall grass (2.5 feet)	3.01	.00	.00	.00	2.5	25
	Chaparral and shrub fields						
4	Chaparral (6 feet)	5.01	4.01	2.00	5.01	6.0	20
5	Brush (2 feet)	1.00	.50	.00	2.00	2.0	20
6	Dormant brush, hardwood slash	1.50	2.50	2.00	.00	2.5	25
7	Southern rough	1.13	1.87	1.50	.37	2.5	40
	Timber litter						
8	Closed timber litter	1.50	1.00	2.50	0.00	0.2	30
9	Hardwood litter	2.92	.41	.15	.00	.2	25
10	Timber (litter and understory)	3.01	2.00	5.01	2.00	1.0	25
	Slash						
11	Light logging slash	1.50	4.51	5.51	0.00	1.0	15
12	Medium logging slash	4.01	14.03	16.53	.00	2.3	20
13	Heavy logging slash	7.01	23.04	28.05	.00	3.0	25

The fuel models are used to label the current and historic fuels in the unit. The current fuels are those that exist now. The historic fuels are the climax fuel models or those that existed prior to recent fire occurrence in the area. Past wildfires and Vegetation Management Program (VMP) burns have modified these fuels to their current condition. We must assess these areas to determine the historic fuels prior to the fires or what fuels the land will be converted to. The historic fuel models will be used to label the four CDF planning belts found in the San Bernardino Unit as grass, brush, and desert or conifer types.

In Southern California only, criteria to issue RED FLAG WARNINGS depend upon Burning Index values for the predominant fuel model that will support and carry fire - a value that changes seasonally. In spring finer fuels such as grass are used. From June until January chemise and chaparral fuel models are used for elevations below 4000 ft - and timber above 4000 ft. If BI's are low and critical weather conditions exist, NO RED FLAG is issued.

Fire behavior differences among the four groups are basically related to the FUEL LOAD and its DISTRIBUTION among the fuel particle size classes. See **chart** on page 11. Each fuel model is described by the fuel load and the ratio of surface area to volume for each size class; the depth of the fuel bed involved in the fire front; and fuel moisture and/or moisture of extinction. Additionally, fuel loading varies with fuel depth - and the horizontal or vertical orientation of the fuel bed.

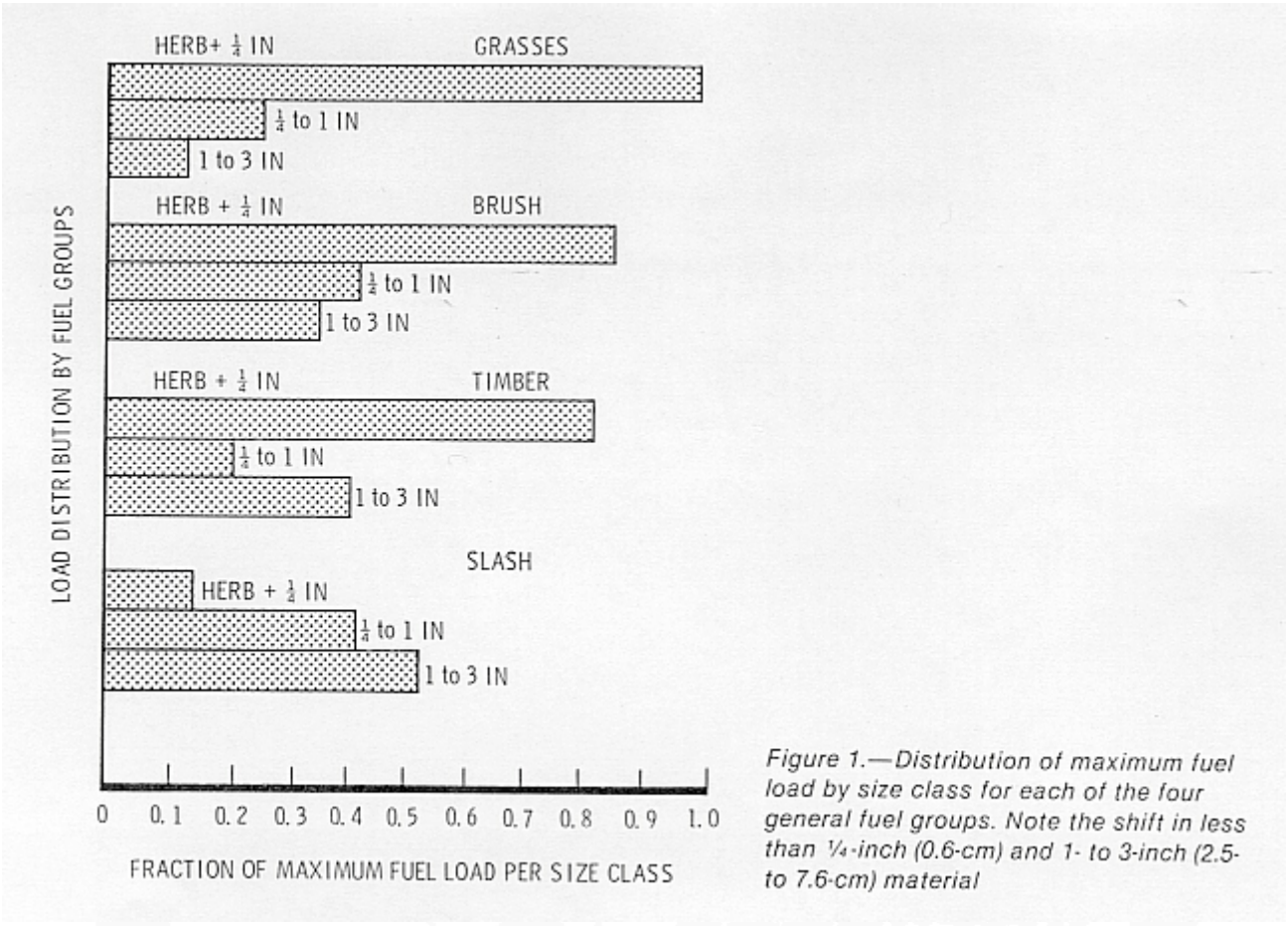


Figure 1.—Distribution of maximum fuel load by size class for each of the four general fuel groups. Note the shift in less than ¼-inch (0.6-cm) and 1- to 3-inch (2.5- to 7.6-cm) material

A second term associated with fuels is **Ladder Fuels**. These are a continuous arrangement of fuels from the surface to the canopy that carry a fire from the surface up into the canopy. When the fire is carried from one fuel group into another, the fire likely will behave differently as changes occur in fuel models, fuel moistures and meteorological conditions. Often new fire behavior calculations are required if the initial calculations did not account for this change.

The current fuel model, slope class, ladder fuel, crown closure component, and difficulty of control rating are used to derive the fuel hazard rank for each quad 81st. CDF staff in Sacramento determined that there are realistically no low hazard fuels in California, thus the fuels are ranked medium, high, or very high.

San Bernardino fuels models have recently been upgraded from FRAP after significant effort with Unit personnel and preliminary vegetation imagery has been reviewed and validated. Fuels validation, will continue and is constantly being reevaluated to consider the effects of fire history in the Unit. See Appendix #12

Structure Fuels

Research on home ignitability implies that homeowners have the ultimate responsibility for reducing home fire loss potential because they alone have the authority to make the necessary changes on their privately owned property.

Home ignitability ultimately may require a change in thinking between the relationship of homeowners and the fire services. Instead of pre-suppression and fire protection responsibilities residing with fire agencies, homeowners (Stakeholders) take the principal responsibility for assuring adequately low home ignitability.

In the San Bernardino Unit federal, state and local fire services have become a community partner providing homeowners with technical assistance, fuels project assistance as well as fire response in a strategy of assisted and managed community stakeholder self-sufficiency.

To this end, San Bernardino Unit Pre Fire and Resource personnel and The Inland Empire Fire Safe Alliance, with assistance from the Southern Area Office have collaborated to submit a federal Forest Fire Assistance grant application that would, if successful, assist homeowners with the removal of hazardous fuels on private property. The intent is to avail forest homeowners of the opportunity to receive assistance and at the same time take ownership for reducing the structure ignitability of their homes on small urbanized forest parcels. See Appendix “Small Parcel Hazardous Fuel Reduction Program”

The Bark Beetle Situation

Six years of severe drought have left the forests of the San Bernardino Mountains, significantly stressed and vulnerable to a bark beetle infestation that has created thousands of deadand dying trees.

This has created an extreme fire hazard resulting in Governor Gray Davis declaring a State of Emergency on March 7, 2003, and extensive multi-agency, community, landowner and resident efforts to reduce the fire threat and to plan for the possibility of wildfire.

"Trees on more than 600,000 acres have died and an estimated 75,000 residents are threatened by catastrophic wildfire, injury and property damage from falling trees," said Governor Davis. By declaring a State of Emergency the Governor reduced the "red tape" and provided landowners with the regulatory relief necessary to quickly remove dead and dying trees from their property.

It is the responsibility of private property owners to remove dead and bark beetle infested trees. Due to the extreme fire danger and the danger of falling trees, officials encourage prompt tree removal.

The magnitude of the problem has necessitated a multi agency state, federal and local government response. The CDF San Bernardino Unit has been taking steps to protect public safety identifying major travel routes into and out of these hard hit areas. These routes would be used in the event of a wildfire not only for evacuation of residents but also for response by emergency vehicles. Local CDF personnel are also working with the MAST organization and local communities to identify fire safe areas of refuge such as schools, parks and community centers that would be safe locations for residents to seek temporary protection in the event of a wildfire. As mentioned previously CDF conservation camp crews have been busy removing trees that might be susceptible to falling and blocking evacuation routes or threaten areas of refuge. Because of the significant fire and falling hazard these trees posed, essential service sites such as, fire and police stations and communication and fueling facilities, were also targeted.

These efforts also proved valuable during the winter of 04-05 since many of the trees that were removed, were the same trees that would have fallen on roadways in the severe winter storms. During the last two years CDF camp crews felled and removed more than 19,000 trees in such areas.

FREQUENCY OF SEVERE FIRE WEATHER

The San Bernardino Unit is currently experiencing the significant effects of six years of below normal rainfall. This shortage of moisture is contributing in no small way to the huge increase of conifer mortality in the San Bernardino Mountains. Fire weather is one of the most important factors to consider in a study of wildland fire history and potential for a given area. In the fire plan, past weather data will be used to calculate the Level of Service (LOS), assign a severe fire weather ranking to each quad 81st, and run the California Fire Economics Simulator, Version 2 (CFES2). In order to perform these operations, it is necessary to gather past weather records from local weather stations that cover different areas within the Unit. Each quad 81st is assigned a weather station from which the data can be collected. To insure the most complete assemblage of weather records, alternate weather stations can also be assigned. Prior to 1991, the CDF Remote Automated Weather Stations (RAWS) maintained incomplete data due to malfunctions and other equipment problems. During this period and any other time the data is not available, the weather data will come from other weather stations that cover similar areas outside the Unit.

Fire weather data will be used in several ways in future plan analysis. In the LOS program, it will be used to calculate the Burn Index (BI) and Energy Release Component (ERC) to determine the fire intensity for each fire ignition that occurred during the analysis period. From these components and other ignition information, the fire will be categorized as an initial attack success or failure. This software will also calculate the severe fire weather rank (high, medium, or low), for each quad 81st, based on the weather data, slope and other quad 81st attributes. In CFES2, the historic weather data will be used to project fire indices (BI, ERC, Rate Of Spread (ROS)) to be used in simulating wildland fires in the future. This information will then be used to analyze how changes in fire suppression forces will affect the Unit's level of service.

PRIORITY AREAS

Important components of the fire management plan are projects that can reduce the impact of dangerous wildland fires. Projects currently active in the San Bernardino Unit are summarized below.

Fuel Modification along Designated Evacuation Routes and around Shelter in Place Locations

As Described in the San Bernardino County Sheriff's Evacuation Guideline

For the Mountain Communities Version 6.0

As previously mentioned, the San Bernardino Unit has experienced record setting drought, and the accumulation of timber in excess of sustainable levels within the San Bernardino Mountains and significant infestation by Bark Beetles and other destructive insects and disease . This has resulted in vegetation mortality affecting some 600,000 acres and growing at an estimated rate of between 300 and 600 acres a day depending on vegetation type and aspect. The communities within and adjacent to the San Bernardino Mountains are at extreme risk for a life threatening conflagration. (See attached vegetation mortality map and tabular data).

Local, State and Federal agencies with a jurisdictional responsibility, along with Fire Safe Councils, Southern California Edison and other private/commercial interests have formed the Mountain Area Safety Taskforce (MAST). MAST has identified four main priorities:

1. Remove fuel from roads and highways identified in the San Bernardino County Sheriff's Evacuation Plan V. 5.0 as evacuation routes.

2. Remove fuel from within and surrounding points of refuge areas as identified in the San Bernardino County Sheriff's Evacuation Plan V. 5.0.

3. Remove fuel around all communication and essential service sites within the mountains to ensure reliable fire and law enforcement radio communication and operations in the event of a fire.

4. Create fire defense buffers around mountain communities.

The intent of all fuel reduction projects in the San Bernardino Mountains are to eliminate extreme overstocked conditions. A return to a more naturally sustainable stocking condition will in and of itself improve community fire safety and an enhanced watershed environment. As such, all efforts of CDF fire crews in the San Bernardino Mountains are focused on this goal. Additionally, the San Bernardino Unit has drafted for consideration the "California State Watershed Health Initiative", Legislative Concept Paper (Appendix#1) with the goal of sustained long term maintenance and enhancement of privately held watersheds. If realized to it's full potential, this initiative would go a very long way toward meeting the California Fire Plan goal and that of the Mountain Area Safety Task Force objectives of reducing costs and loses due to wildland fires.

EVACUATION ROUTES

The Governor has declared a State of Emergency for this area and directed the Public Utilities Commission to order Southern California Edison (SCE) and Bear Valley Electric to remove all dead trees that constitute a threat to distribution facilities and power lines. As a participant in the MAST, Southern California Edison has prioritized their line clearances to also meet priority area objectives #1 and #2 to the greatest extent possible.

There are 210 miles of designated evacuation routes identified in the evacuation plan. Of those 210 miles, 65 miles are outside the boundaries of the San Bernardino National Forest (SBNF) and the remaining 145 are within the SBNF boundaries. To date there have been no funds allocated to CDF to carry out the work of removing dead, dying or diseased trees that threaten major travel routes, however, the Unit is hopeful that future initiatives will provide funding relief. Many of the evacuation routes have either Southern California Edison transmission or distribution lines immediately adjacent to them. SCE's clearance has reduced the amount of evacuation route clearance that would have had to be conducted by CDF and the USFS. Evacuation clearance will take an estimated three to five years to complete and will be carried out in four phases:

1. Remove dead and dying trees that are in danger of falling on and closing off evacuation routes.

2. Remove all dead and dying trees that are within 200 feet of the centerline of all evacuation routes and removing all vegetation necessary to construct within that 200 feet a shaded fuel break

3. Remove dead and dying trees that are within 400 feet of the centerline of an evacuation route and on a 30% or greater slope and removing all vegetation necessary to construct within that 400 feet a shaded fuel break

4. Remove dead and dying trees that are within 600 feet of the centerline of an evacuation route and within a chimney and removing all vegetation necessary to construct within that 600 feet a shaded fuel break

SHELTER IN PLACE

Contained within the evacuation plan are four areas designated as temporary evacuation holding areas and 15 areas designated as Shelter in Place (SIP), pursuant to Sheriff's MAST recommendations. SIP locations are generally schools and organizational camps. In order for these areas to safely shelter civilians who are not trained or equipped to survive in a potential conflagration fuel must be reduced from within and surrounding each of these areas. Dependent on predictable factors of fire behavior such as fuel (type, continuity, etc), slope, aspect etc shaded fuel breaks need to be constructed up to 600 feet from the boundary of the SIP.

Estimated costs associated with the above referenced projects are:

Evacuation route clearance (danger of falling and closing only)	$ 270,400
Evacuation route clearance (200')	$ 5,053,620
Evacuation route clearance (400')	$10,107,240
Evacuation route clearance (600')	$15,314,000
SIP clearance around schools	$ 1,547,252
SIP clearance around organizational camps	$ 4,916,400
Total	**$37,208,912**

FIRE DEFENSE IMPROVEMENT AND EVALUATIONS

Fuel break and "Truck Trail" access in Southwest San Bernardino County were evaluated for effectiveness as defense lines and access roads in the event of wildfire. Recommendations were made to abandon or repair fuel breaks and roads. One road was recommended for abandonment due to urban development and alternate access. Other fuel breaks were identified for improvement due to community developments and proximity to proposed burn projects. Following are associated costs.

Battalion 1 Evaluation	$478.00
Battalion 2 Evaluation	$780.00
Battalion 2 Fuel Break Improvement	$54,194.00
Total	**$55,452.00**

Additionally, the Unit has identified private fire road damage in Battalions 1 and 2. Severe winter rains have caused some roads to become impassable, thus making them unusable for fire fighting operations. Approximately $80,000 has been requested from the federal government in order to affect repairs to these roads.

EDUCATION PROGRAMS

A variety of educational programs are conducted to promote fire safety and responsibility. programs ranging from school presentations regarding prescribed burning to public meetings where vegetation management and fire safety are promoted. Public and agency education is a key component of virtually all aspects of fire protection planning and operations in the San Bernardino Unit.

IGNITION MANAGEMENT

In addition to the priority project areas listed above, the San Bernardino Unit will continue residential, utility line, and railroad right-of-way inspections to help mitigate potential ignitions. Motorized equipment will be monitored and inspected where needed in an effort to minimize the number of fires caused by "equipment use" (historically, the Unit's largest percentage of fire ignitions).

Unit employee performance is enhanced by localized training in Preliminary Fire Cause and Origin Investigation during the annual Continued Professional Training academies. This course emphasizes effective fire investigation techniques in an effort to reduce the amount of LE-66's (investigation forms) listing fire cause as "undetermined" or "miscellaneous".

During Operation Santa Ana, a collaborative effort with Southern California Edison, Unit fire prevention personnel inspect all of the power poles and power lines in the wind-prone areas of the San Bernardino Unit. This joint program has proven to be very effective by visually inspecting approximately, 1,321 miles of power lines and 9,800 power poles. The first year of the program identified well over 250 Public Resources Code (PRC 4292, pole clearance and PRC 4293, line clearance) violations. The program is implemented in the summer months and after six years; usually less than 70 violations are discovered. The San Bernardino Unit has not suffered any large damaging wildland fires during Santa Ana wind events since this program was initiated in 1999.

APPENDIX

1. California State Watershed Health Initiative
   Legislative Concept Paper

2. Small Parcel Hazardous Fuel Reduction Grant Proposal

3. Fire Safe Council – Stakeholders Rooster

4. San Bernardino Mountains – Vegetation Mortality (map)

5. San Bernardino Mountains – CDF Fuel Types (map)

6. Bark Beetle Mortality – Bark Beetle mortality priority treatment area, layer and inventory methods

   6a - San Bernardino mountains, number of recent dead trees by status and owner
   6b - San Bernardino mountains, number of recent dead trees by status and owner inside treatment area
   6c - San Bernardino mountains, Non Federal number of recent dead trees by status and mortality level
   6d - San Bernardino mountains, number of living trees by owner and forest type at risk in 2004

7. Lake Arrowhead, Twin Peaks and Cedar Glen Tree Mortality Removal Projects (map)

8. Oak Glen Fireshed Analysis Area – Condition Class (map)

9. Oak Glen Fireshed Analysis Area – Proposed Treatment Options (map)

10. Oak Glen Fireshed Analysis Area – Existing Conditions (map)

11. Structure Threat Rank (map)

12. Fuel Rank (map)

LEGISLATIVE CONCEPT PAPER

DECEMBER 16, 2003

"CALIFORNIA STATE WATERSHED HEALTH INITIATIVE"

STATEMENT OF PROBLEM

CALIFORNIA'S PRIVATELY OWNED URBANIZING NATIVE FORESTS AND WATERSHEDS HAVE BEEN PROTECTED RATHER THAN MANAGED. THIS HAS CREATED UNHEALTHY FORESTS AND WATERSHEDS SUSCEPTIBLE TO DESTRUCTIVE FIRES, INSECT INFESTATIONS AND DISEASES. THE STATE'S PRIVATELY OWNED FORESTS ARE LARGELY OVERSTOCKED AND SUBJECT TO STRESS RESULTING FROM THE TYPICAL DROUGHT CYCLES ASSOCIATED WITH A MEDITERRANEAN CLIMATE. COMBINED WITH THE ADDITIONAL IMPACTS OF URBAN DEVELOPMENT, THE HEALTH OF OUR STATE'S PRIVATELY OWNED FORESTS AND WATERSHEDS IS RAPIDLY DETERIORATING AND THREATENS THE FUTURE EXISTENCE OF COMMUNITIES, LOCAL NATURAL RESOURCES, WATER QUALITY AND THE ECONOMY OF THE STATE OF CALIFORNIA.

PROPOSED SOLUTION

BASED UPON VALUES AT RISK AND LIABILITIES, CAUSED BY UNMANAGED FORESTS AND WATERSHEDS, ENFORCEABLE REGULATORY STANDARDS WHICH RECOGNIZE STANDARDS FOR THE PROMOTION OF A HEALTHY FIRE RESISTANT FOREST AND WATERSHEDS ARE NEEDED. THIS PROPOSAL FOCUSES ON THE RELATIONSHIPS BETWEEN THE NUMBER TREES PER ACRE, FOREST LAND PRODUCTIVITY AND THE REDUCTION OF LADDER FUELS WHICH PROMOTE FOREST FIRES AND THE IMPACTS OF DEVELOPMENT IN WATERSHEDS.

THE UNIFORM FIRE (UFC) AND THE UNIFORM BUILDING CODES (UBC) PROVIDE MINIMUM FIRE SAFE STANDARDS FOR NEW CONSTRUCTION. THE PUBLIC RESOURCES CODE (PRC) CONTAINS LANGUAGE FOR SUCH MINIMUM BUILDING STANDARDS AS ROAD WIDTHS, TURNING RADII, WATER FLOW, AND ADDRESSING. ADDITIONALLY THE PRC AND LOCAL WEED ABATEMENT ORDINANCES ESTABLISH MINIMUM RESIDENTIAL WEED CLEARANCE STANDARDS. THESE STANDARDS HAVE BEEN CREATED TO PROTECT LIFE AND PROPERTY.

THIS PROPOSAL IS INTENDED TO CREATE LANGUAGE WITHIN THE PUBLIC RESOURCES CODE WHICH WOULD ACKNOWLEDGE THAT UNMANAGED PRIVATE FOREST LANDS THAT EXCEED SPECIFIC STOCKING OR TREE NUMBERS PER ACRE (DENSITY) AND SITE PRODUCTIVITY CLASSIFICATION ARE A PUBLIC NUISANCE. AS A PUBLIC NUISANCE LAND OWNERS WOULD BE REQUIRED TO ABATE OR MANAGE SAID LANDS, OR THE STATE WOULD IMPOSE FINES OR TAKE ACTION TO REMEDY THE NUISANCE AT COST TO THE LANDOWNER. UNMANAGED FORESTS ARE INCREASINGLY SUSCEPTIBLE TO DESTRUCTIVE FIRES, INSECT INFESTATIONS AND FOREST DISEASES WHICH ARE REMEDIED AT GREAT COST BY ALL CALIFORNIA RESIDENTS.

COMPLIANCE WITH THIS NEW REGULATION WOULD REQUIRE, RATHER THAN PERSUADE, FOREST LANDOWNERS TO MEET MINIMUM AND MAXIMUM FOREST STOCKING OR TREE NUMBERS PER ACRE STANDARDS. THE CALIFORNIA DEPARTMENT OF FORESTRY AND FIRE PROTECTION WOULD BE CHARGED WITH ENFORCEMENT OF THIS REGULATION AND ITS STANDARDS. INSPECTION OF ALL UNINCORPORATED FOREST LAND PARCELS WOULD OCCUR EVERY 5 YEARS

THIS PROPOSAL IS ALSO INTENDED TO CREATE LANGUAGE WITHIN THE PUBLIC RESOURCES CODE WHICH WOULD SET MINIMUM STANDARDS FOR DEVELOPMENT WITHIN WATERSHED LANDS, INCLUDING THOSE CONTAINED WHOLLY OR IN PART WITHIN INCORPORATED CITY LIMITS, WHICH WOULD ENSURE THE VITALITY, HEALTH AND FUNCTIONALITY OF THOSE LANDS AS WATERSHEDS. FUNDING FOR TREE REMOVAL MATCHING GRANTS WOULD BE AVAILABLE ONLY TO CITIES AND COUNTIES THAT AGREE TO ADOPT ORDINANCES, ZONING AND BUILDING CODES AND PLANNING POLICIES THAT ENSURE FIRE WISE CONSTRUCTION.

HOUSING, COMMERCIAL AND RETAIL DEVELOPMENT MAY BE LIMITED BASED ON CRITERIA SUCH AS DEGREE OF SLOPE, VULNERABILITY TO LOSS FROM WILDLAND FIRE, WATER QUALITY AND DRAINAGE IMPACTS AS WELL AS OTHER NEGATIVE IMPACTS ON WATERSHED FUNCTIONS. PAVING LIMITATIONS OR PERMEABLE PAVING ALTERNATIVES COULD ALSO BE REQUIRED TO ENSURE THAT ADEQUATE WATERSHED FUNCTION WILL BE MAINTAINED AND THAT STORMWATER, DEBRIS AND FLOODING WILL BE MINIMIZED.

CONSEQUENCE OF INACTION

INACTION WILL SEE THE CONTINUED BUILD-UP OF UNMANAGED FOREST FUELS IN STATE RESPONSIBILITY AREA FORESTS AND WATERSHEDS THROUGHOUT THE STATE. THE RESULT WILL BE THE PERPETUATION OF OVERSTOCKED, STRESSED FORESTS AND WATERSHEDS THAT ARE SUSCEPTIBLE TO DESTRUCTIVE AND INCREASINGLY EXPENSIVE WILDFIRES, INSECT INFESTATIONS, AND DISEASES, WHICH AFFECT PUBLIC SAFETY AND WATERSHED RESOURCE VALUES. THE LACK OF MINIMAL STATE WIDE DEVELOPMENT STANDARDS IN WATERSHEDS HAVE ALLOWED CITIES AND COUNTIES TO APPROVE DEVELOPMENT IN AREAS OF THE STATE WITHOUT ADEQUATE PROTECTION OF WATERSHEDS INCREASING COSTS FOR FIREFIGHTING AND SIGNIFICANT IMPACTS TO THE STATE'S WATER QUALITY AND SUPPLY. THE FISCAL IMPACT OF THESE DECISIONS IS BORNE BY TAXPAYERS STATEWIDE.

ALTERNATIVE

CDF AND ITS COOPERATORS HISTORICALLY HAVE PURSUED PUBLIC EDUCATION EFFORTS TO ACHIEVE PUBLIC SUPPORT FOR FOREST MANAGEMENT ON PRIVATE FOREST LANDS OF ALL SIZES. THESE EFFORTS HAVE HAD LIMITED SUCCESS. THE CONTINUED URBANIZATION OF CALIFORNIA FOREST LAND AND WATERSHEDS REQUIRES IMMEDIATE ACTION. THERE ARE NO OTHER METHODS TO ADDRESS THIS EXPANDING PROBLEM AND ITS IMPACTS ON SRA WATERSHEDS. LEGISLATION IS REQUIRED. EDUCATION AND REGULATORY ENFORCEMENT PROVIDED BY CDF AND ITS COOPERATORS IS REQUIRED TO AFFECT LONG TERM CHANGE AND REDUCE THE COST OF THE CONSEQUENCES OF IMPERILED FORESTS AND CATASTROPHIC FIRE.

ENSURING THE HEALTH AND VITALITY OF CALIFORNIA'S FORESTS AND WATERSHEDS WILL RESULT IN MORE NATURAL AND FIRE RESISTIVE FORESTS AND WATERSHEDS. APPROPRIATE LAND MANAGEMENT AND BUILDING STANDARDS WILL REDUCE HUMAN AND PROPERTY LOSS TO WILDFIRE WITH RESULTANT SAVINGS IN THE COST OF FIGHTING WILDFIRES.

OTHERS AFFECTED

CITIES AND COUNTIES, PLANNING AGENCIES, CODE ENFORCEMENT AND LOCAL FIRE PROTECTION AGENCIES, WATER AGENCIES AND DISTRICTS AND WATERSHED GROUPS AND AUTHORITIES.

HISTORY

OUR NATIONAL AND STATE FIRE POLICIES WERE LARGELY ESTABLISHED FOLLOWING THE LARGE LIFE AND PROPERTY LOSS FIRES THAT OCCURRED IN THE LATE 1800'S TO 1910. THESE POLICIES ESTABLISHED THE GOAL OF SUPPRESSING ALL WILDFIRES AT TEN ACRES OR LESS. THIS HAS RESULTED IN THE EXCLUSION OF THE BENEFICIAL EFFECTS OF WILDFIRE IN FORESTS AND WATERSHEDS CONTRIBUTING TO THE OVERSTOCKING OF THESE LANDS AND THEIR SUSCEPTIBILITY TO DROUGHT IMPACTS. ADDITIONALLY, LAND MANAGEMENT AND PLANNING DECISIONS IN THESE LANDS HAVE BEEN MADE BY LOCAL GOVERNMENT WITHOUT ADEQUATE CONSIDERATION OF THE IMPACTS ON WATERSHED FUNCTIONS. "THE STATE, AS A QUASI SOVEREIGN, HAS A RIGHT TO PROTECT A WATERWAY FROM THE IMPACTS OF PRIVATE PROPERTY OWNERS." OLIVER WENDELL HOLMES. LAND USE DECISIONS IN WATERSHEDS, BY LOCAL GOVERNMENTS, HAVE NEGATIVELY IMPACTED THE CITIZENS OF CALIFORNIA LIVING OUTSIDE THE LOCAL GOVERNMENT'S JURISDICTION. THOSE IMPACTS HAVE BEEN REDUCED WATER QUALITY AND SUPPLY, SOIL EROSION, FLOODING AND THE INCREASED COSTS OF WILDLAND FIRE SUPPRESSION.

FISCAL AND ECONOMIC IMPACTS

THE COSTS OF WILDLAND FIRE SUPPRESSION HAVE BEEN INCREASING IN CALIFORNIA ON AN ANNUAL BASIS DRIVEN LARGELY BY THE INCREASED EFFORTS REQUIRED TO PROTECT LIVES AND PROPERTY AS DEVELOPMENT HAS ENCROACHED INTO THE WILDLAND AREAS OF THE STATE. OTHER FIRE IMPACT COSTS, WHICH HAVE NOT BEEN CALCULATED ON A STATEWIDE BASIS, INCLUDE AMONG OTHERS AVAILABILITY AND COST OF PROPERTY INSURANCE, FLOOD CONTROL IMPACTS, WATER QUALITY AND WATER SUPPLY AS WELL AS SPECIES HABITAT AND RE-FORESTATION. FOR EXAMPLE FOLLOWING THE 2003 FIRES IN SAN BERNARDINO COUNTY WATER AGENCIES DETERMINED THAT:

- TOTAL RUNOFF IS LIKELY TO INCREASE BY MORE THAN 10% AND PEAK STORM FLOWS WILL INCREASE ABOUT 5 TIMES NORMAL.
- SEDIMENT LOADS CARRIED DOWN STREAM COULD BE 30 TO 50 TIMES NORMAL. THIS MAY TAKE YEARS TO REMOVE.
- FLOOD CONTROL BASINS WILL LIKELY BE BREACHED AND AREAS WITHOUT FLOOD CONTROL BASINS MAY HAVE CATASTROPHIC FLOOD AND DEBRIS DAMAGE.
- LONG DURATION INCREASES IN WATER TURBIDITY INCLUDING FINE SEDIMENT MAY BE CARRIED FAR DOWN STREAM COMPLICATING GROUNDWATER DISCHARGE.
- A 2-10 FOLD INCREASE IN TOTAL DISSOLVED SOLIDS (TDS) OR SALTS WITH INCREASED FLOWS COULD RESULT IN AS MUCH AS 500,000 TONS OF ADDED SALT IN THE SANTA ANA RIVER AND GROUNDWATER BASINS. THE RUNOFF WATER IS NEEDED FOR RECHARGE OR CONSUMPTIVE USE, SIGNIFICANT TREATMENT REQUIREMENTS TO REMOVE OR MITIGATE THIS TDS.
- 20,000 TONS OF NITRATES AND PHOSPHOROUS FORMERLY BOUND IN SOIL AND FROM AIRBORNE DEPOSITION WILL BE RELEASED INTO THE PEAK STORM FLOWS AND MAKE ITS WAY INTO GROUNDWATER.
- THERE WILL BE SIGNIFICANT TRANSPORT OF URANIUM AND ITS RADIOLOGICAL PROGENY DOWNSTREAM IN SURFACE GROUNDWATER INCREASING THE COST OF RADON AND URANIUM TREATMENT AND FUTURE MONITORING.

- INCREASES IN ORGANIC COMPOUNDS, INCLUDING TOXIC AND CARCINOGENIC COMPOUNDS FROM PARTIAL COMBUSTION OF FOREST MATERIALS WILL DECREASE USABILITY OF 70% OF THE SANTA ANA REGION'S PRIMARY WATER SOURCE.
- SEDIMENTATION OF THE LANDS USED BY THE SAN BERNARDINO KANGAROO RAT AND THE SANTA ANA WOOLY STAR FISH WILL CAUSE CHOKING TURBIDITY REDUCING THE USEABLE HABITAT FOR THE SANTA ANA SUCKER FISH.
- ESTIMATED COSTS TO MITIGATE THE FIRE EFFECTS IN THE SANTA ANA WATERSHED RANGE FROM $500,000,000 TO $800,000,000.

GRANT CONCEPT MEMO

SUBJECT: Small Parcel Hazardous Fuel Reduction **DATE:** April 7, 2005 Appen. #2

ORIGINATED BY: CDF San Bernardino Unit **REQUEST TO:** USFS

PROBLEM: The need for private landowners to reduce hazardous fuels within and around the communities in the San Bernardino National Forest (BDF) mountain areas. Educating and instilling ownership in the private landowners of the process of fuel reduction so they can help maintain the dynamic ecosystem of the forest and ultimately reduce their dependency on public funds to maintain a fire safe community in the future.

PROJECT CONCEPT:

- $4.0 (from a total of 4.9m) million federal dollars are available from the Department of Agriculture, United States Forest Service for the San Bernardino National Forest area. Funds will be granted to The California Department of Forestry and Fire Protection (CDF) and the Inland Empire Fire Safe Alliance (IEFSA) for the development and implementation of an incentive program for the thinning of pre-commercial, green trees on private, residential, forested lots.

- The program is designed to provide a financial incentive to private landowners within BDF and on parcels less than 5 acres to reduce hazardous fuels and promote a healthy forest. Priority will be given to a landowner whose property lies within ¼ mile of the boundary of the National Forest.

- An application by the landowner and verification by grant personnel that the land is a viable project within the scope of the grant funds will begin the process. Once the project is approved the landowner will be responsible for completing the work according to the specified standards. Once the work is complete a reimbursement form will be submitted by the landowner to the entity controlling the reimbursement funds. Then, verification of the project meeting the program standards will be documented and noted for reimbursement to the private landowner. Reimbursement will be at 75% of the private landowner's costs or the maximum cap rate, whichever is less.

- The 25 % match will be achieved in the landowner's 25% match. It is anticipated that landowners will incur more than the 25 % of the match required for their projects.

DESIRED OUTCOME: Fuel reduction on private land by encouraging private landowners to reduce fuels in the short term and to maintain the fuel reduction in the long term. Education of the landowners of the benefits of fuel reduction for fire safety of their property and the community as well as the benefits of a healthy forest.

IMPLEMENTATION PROPOSALS:

CDF will become the grantee of $910,000 of the $4.0 million available and will perform the following:

1) Contract with a consulting forestry firm for field evaluation of potential projects and confirmation of completed projects. Consultant will also participate in the education of landowners regarding fuel reduction and healthy forest management.

2) Complete the necessary environmental review through a combination of CDF staff work and contractors.

3) Develop the overall project and coordinate the interface of IEFSA, contractors, and landowners.

4) Oversight of the overall project and coordination with other hazardous fuel reduction projects in the area through additional staff positions (2.0) assigned to CDF.

The Inland Empire Fire Safe Alliance will become the grantee of $3.09 million of the $4 million available in a cooperative role and will perform the following:

1) Provide staff for project administration, grant tracking, processing applications and contracts, promoting program with landowners, and phone contact with landowners.

2) Provide consulting forestry firm with necessary information to conduct field survey of projects, obtain signed contract, and review completed projects.

3) Development of an automated tool for documenting and tracking of potential landowner's participation, contracts, funds available, funds committed and funds expended. This tool will also be capable of generating reports for both CDF and IEFSA grant reporting.

Pro: The bulk of the funds are directed to the IEFSA which can most efficiently develop the infrastructure to direct the greatest dollar amount to on the ground work. The CDF's experience in managing fuel reduction and forest health projects is capitalized on without excessive encumbrance of government contracting processes. Retention of the consulting forestry firm under the CDF portion of the grant maintains direct oversight of the consultant by professional resource managers.

San Bernardino Unit
Fire Safe Council Stakeholder Rooster

Appen. #3

San Bernardino County

Angelus Oaks Fire Safe Council
P.O. Box 116
Angelus Oaks, CA 92305
Office: (909) 794-6247

Arrowhead Communities Fire Safe Council
PO Box 630
Rim Forest, CA 92378
Office: (909) 337-3383

Big Bear Valley Fire Safe Council
P.O. Box 2860
Big Bear Lake, CA 92315
Office: (909) 585-7662

Carbon Canyon Fire Safe Council
2005 Grand Avenue
Chino Hills, CA 91709
Office: (909) 902-5280 x231

Lytle Creek Fire Safe Council, Inc.
P.O. Box 94
Lytle Creek, CA 92358
Office: (909) 466-7388

Mountain Rim Fire Safe Council (MRFSC)
PO Box 303
Rim Forest, CA 92378
Office: (909) 337-6844

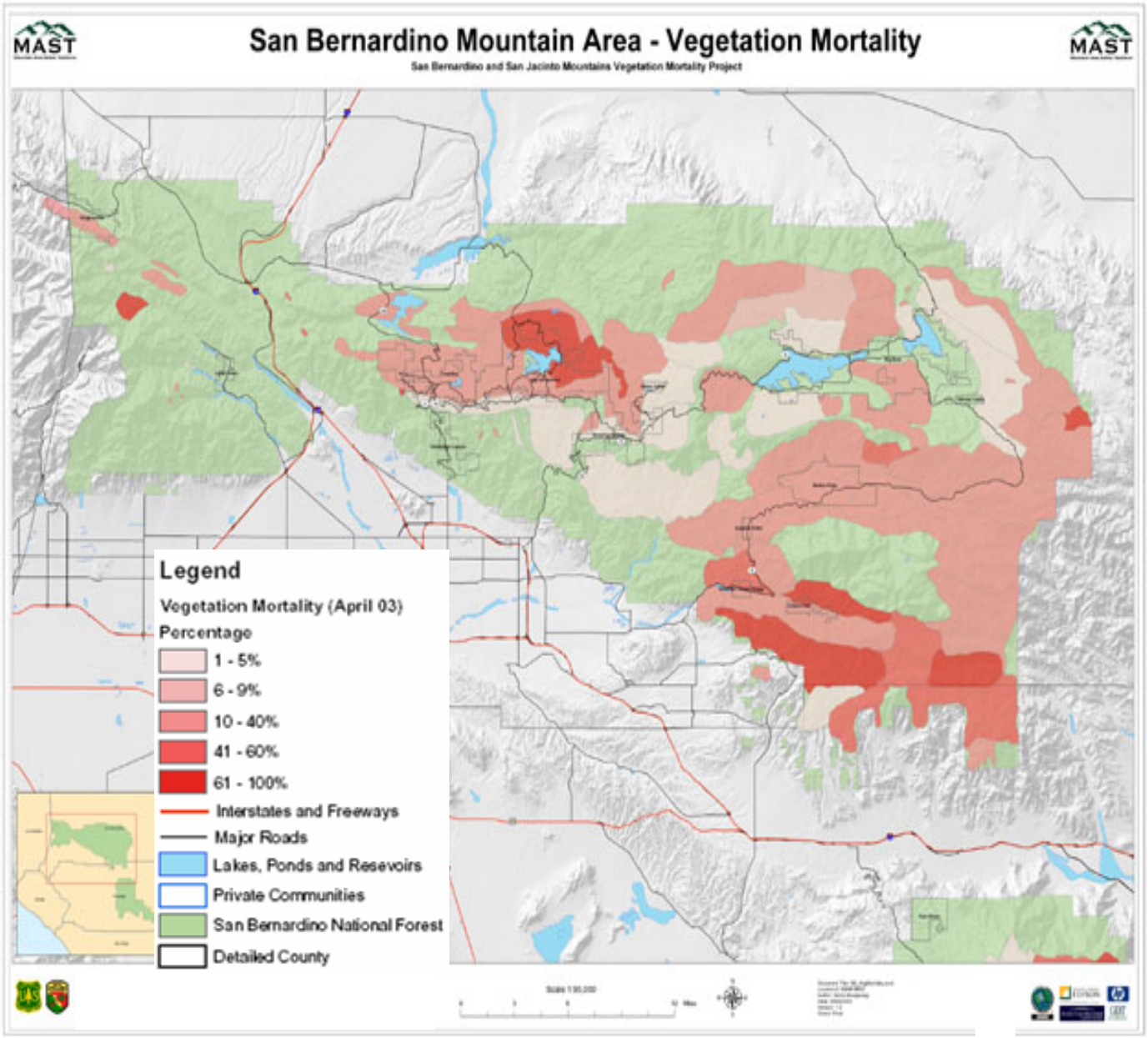
Oak Glen Fire Safe Council
PO Box 820
Oak Glen, CA 92399
Office: (800) 686-8677

Wrightwood Fire Safe Council
6000 Cedar St
Wrightwood, Ca.
Office: (760) 249-3206

Inyo/Mono Counties

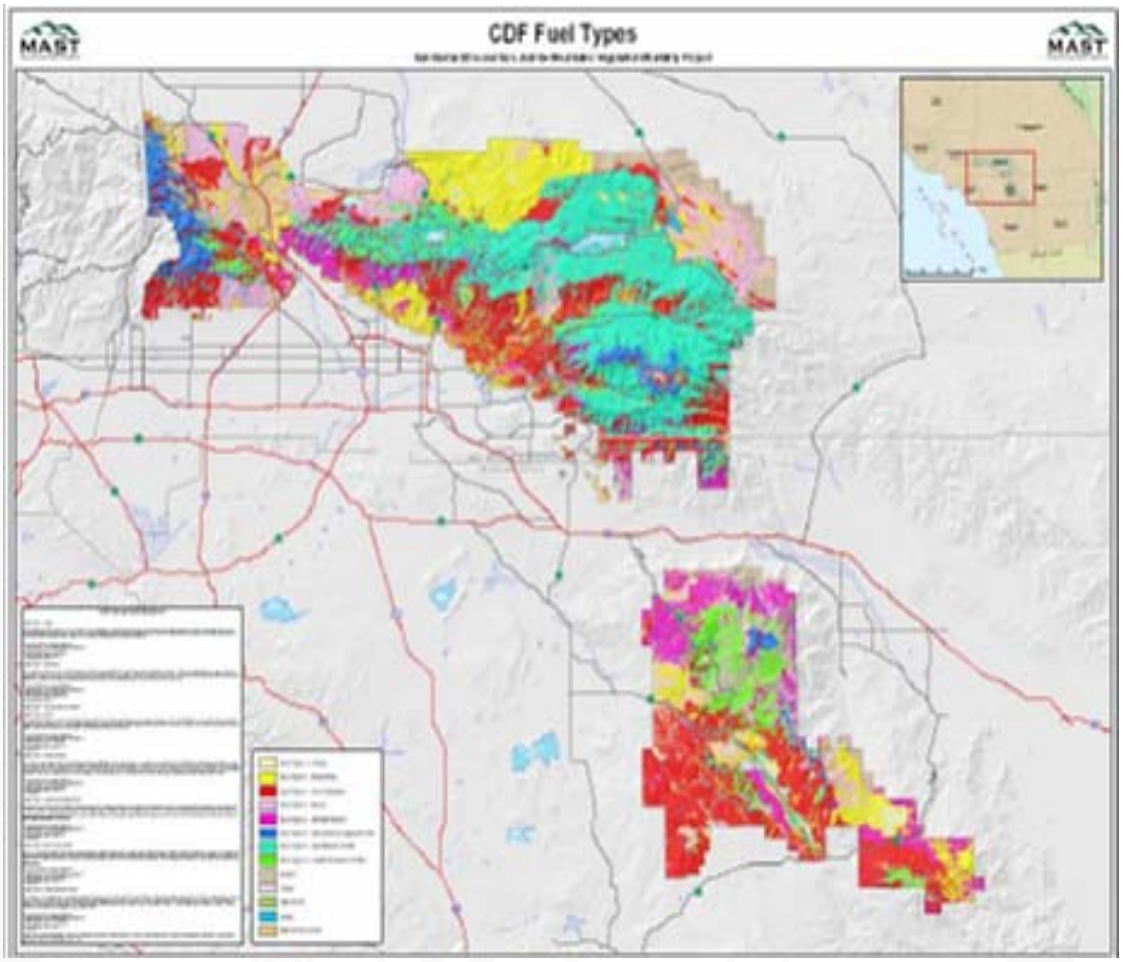
Eastern Sierra Regional Fire Safe Council
76 Canyon Drive
Bishop, CA 93514
Office: (760) 872-3004

Wheeler Crest Fire Safe Council
129 Willow Road
Swall Meadows, CA 93514 Office: (760) 387-2955


MAST
San Bernardino Mountain Area - Vegetation Mortality
San Bernardino and San Jacinto Mountains Vegetation Mortality Project
MAST
Legend
Vegetation Mortality (April 03)
Percentage
1 - 5%
6 - 9%
10 - 40%
41 - 60%
61 - 100%
Interstates and Freeways
Major Roads
Lakes, Ponds and Resevoirs
Private Communities
San Bernardino National Forest
Detailed County

San Bernardino Mountains

Appen. #5



Bark Beetle mortality priority treatment areas, layer and inventory methods

See graphs and charts that follow this narrative

Analysis Methods:
Southern California Bark Beetle Mortality: Priority Treatment Areas based on 2003 Aerial Survey Data:

Purpose:
Approximately one million acres of forest within and directly adjacent to the San Bernardino, Cleveland and Angeles National Forests have experienced severe tree mortality due to a drought-induced pine bark beetle epidemic. These forests are directly adjacent to major metropolitan areas in San Diego, Riverside and San Bernardino Counties. The risks from fire and falling trees pose a major threat to public safety, private property, and ecosystem health. This analysis supports State and Federal government decision making regarding treatment priorities and funding allocations to alleviate bark beetle mortality related hazards.

Estimating Treatment Areas:
Prioritizing Treatment areas: Since many of the high priority treatment areas are overlapping (i.e. transmission line buffers and road buffers are often overlapping), treatment areas were assigned to an asset class based on an assessment of the highest priority need for treatment, with an eye towards identifying the primary funding source. For example the primary funding source for treatment of transmission lines is from the electrical utility companies, while the primary funding source for treatment of roads is government. The following treatment areas are presented in priority order, with the highest priority areas listed first.

For this analysis Treatment areas are defined as:
1. Areas within 150 feet of electricity transmission lines
2. Areas within 150 feet of Primary Roads
3. Areas within 150 feet of Secondary Roads
4. Areas having a housing density of 1 house per 20 acres or greater
5. Areas outside of Federal lands, having a housing density of less than one house per 20 acres or greater and slopes less than or equal to 30%.

Final Mortality Layer Development: A single continuous layer depicting mortality within existing vegetation conditions was developed from several sources. This process combined mortality assessment layers from three different sources with a 2003 existing vegetation layer. The layers used to collectively define the analysis extent and magnitude of mortality were the 2004 aerial sketch mapping polygons of forest mortality, a 1997-2002 Landsat TM based change detection layer, and a 2002-2003 Landsat TM based mortality detection layer. The sketch mapping polygons primarily defined the analysis extent while the change detection layers provided information about the relative magnitude of mortality. These separate layers along with a 1997-2003 fire history layer were combined into a single mortality grid. The fire history data allowed for the discrimination of pest and drought associated mortality from fire related mortality.

The 2003 existing vegetation layer was used to provide information about vegetation type within mortality areas. This layer was also used as the spatial base for a final mortality map for forested types. The relatively fine scale delineations of vegetation composition and structure in the vegetation layer were used to create a larger stand based spatial definition of the change detection mortality pixels. This also had the effect of standardizing the spatial variability between the change detection pixels and the coarser sketch mapping polygons.

The process of labeling vegetation polygons with mortality labels, referred to as regionalization, was the result of a spatial overlay between vegetation layer polygons and a grid of the combined mortality layers. The change detection pixels originally classified mortality into little or no change, low, medium and high classes which were defined by ranges of canopy cover loss. Uncertainty about the thematic precision and spatial application of these classes resulted in assigning each change class a specific canopy loss value in the combined mortality layer. Mortality delineated by the sketch mapping polygons, but not classified in the change detection layers, was assumed to be very low mortality. The following table shows the canopy cover loss values assigned to each mortality class.

Mortality Class	**Canopy Loss Range**	**Mid-point value**
Very Low mortality	0-15%	8%
Low mortality	16-40%	28%
Medium mortality	41-70%	56%
High mortality	>70%	86%

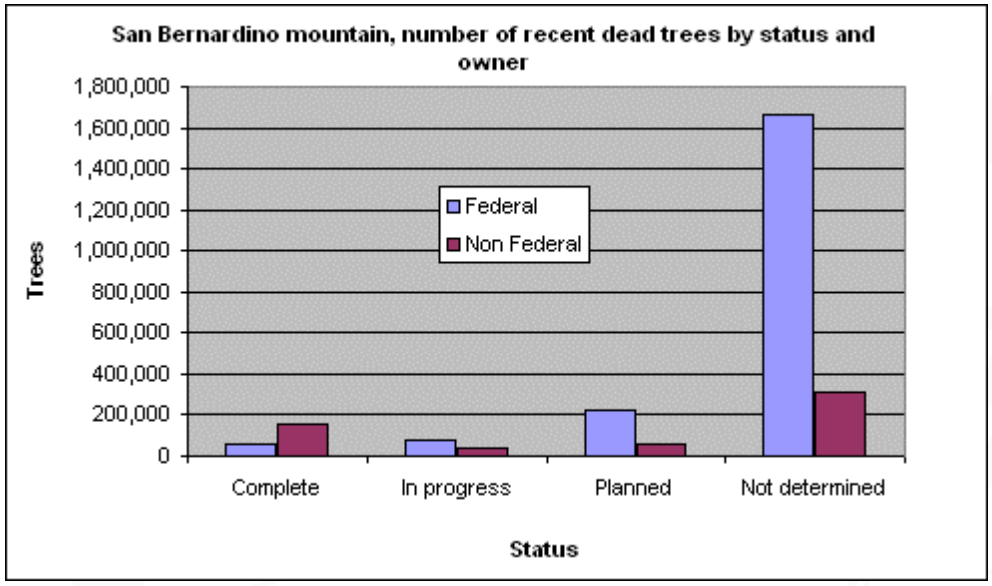
Inventory Data: The estimates of mortality were mostly derived from National Forest inventory data. The majority of the inventory plots were established on the Angeles, San Bernardino and Cleveland National Forests in 1995-1996 with some additions in 2000. The 1993-1994 periodic inventory plots were available on lands outside National Forests. Thus, the established inventory data gave estimates of numbers of trees and volume by species and diameter class in the mapped area *prior* to the mortality event. Forestland plots that fell in non-mortality inclusions or in wildfire areas that occurred between 1997 and 2003 fires were excluded from the analysis for the mapped project area.

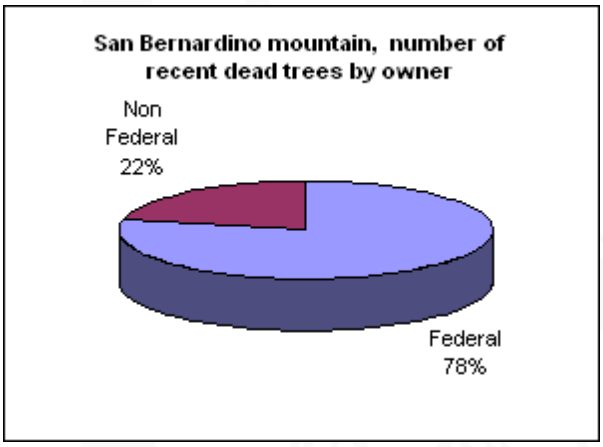
The 124 sample plots within the mapped area were reviewed for mortality on 1:15,840 scale color aerial photography flown on Sept. 5-6, 2003. If any tree mortality was observed on the photography for a plot location, the plot was subsequently visited on the ground by field crews in spring of 2004. Each tree over 5 inches in DBH that had been tallied live at the previous inventory was checked to see if it died. There were 92 sample plots measured in the field (88 on National Forest lands and 4 on lands outside National Forests). The 32 additional sample plots (30 National Forest and 2 outside National Forests) where no mortality had occurred, as determined on the aerial photography, were also included in the sample. The inventory sample of 124 plots allowed investigators to derive estimates of the number of trees, biomass and volume by species and diameter class within the mapped area that had recently died, as well as determine the remaining live trees.

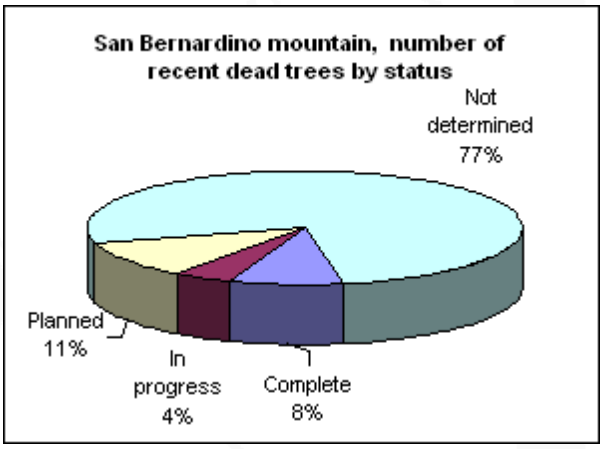
San Bernardino mountain number of recent dead trees by status and owner

Appen.#6a

Owner	Complete	In progress	Planned	Not determined	Grand Total
Federal	59,287	78,104	222,194	1,664,443	2,024,028
Non Federal	156,544	37,556	54,048	313,267	561,415
Grand Total	215,831	115,660	276,241	1,977,710	2,585,443







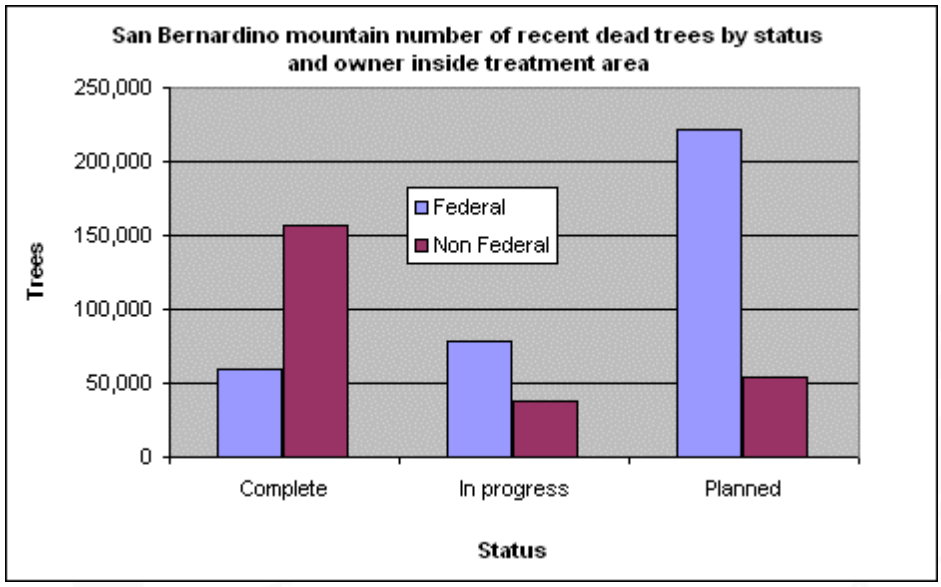
Status data: May 2005
Inventory data: Spring 2004
Vegetation Strata data: Fall 2003

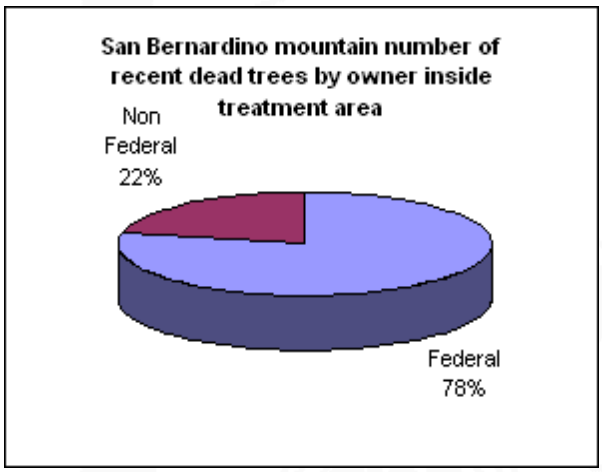
Estimates of the number of recent dead trees removed by agency are based on Statistical estimates derived from 117 FIA plots re-measured in the field, and converted to per-acre estimates. Per acre estimates are then multiplied by the number of acres completed, in progress or planned. These estimates are not derived from project reports of dead trees removed, since not all agencies report this information.

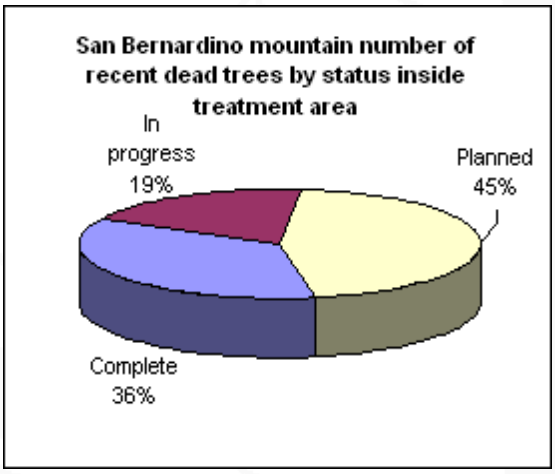
San Bernardino mountain, number of recent dead trees by status and owner inside treatment area

Appen.#6b

Owner	Complete	In progress	Planned	Grand Total
Federal	59,287	78,104	222,194	359,585
Non Federal	156,544	37,556	54,048	248,148
Grand Total	215,831	115,660	276,241	607,733

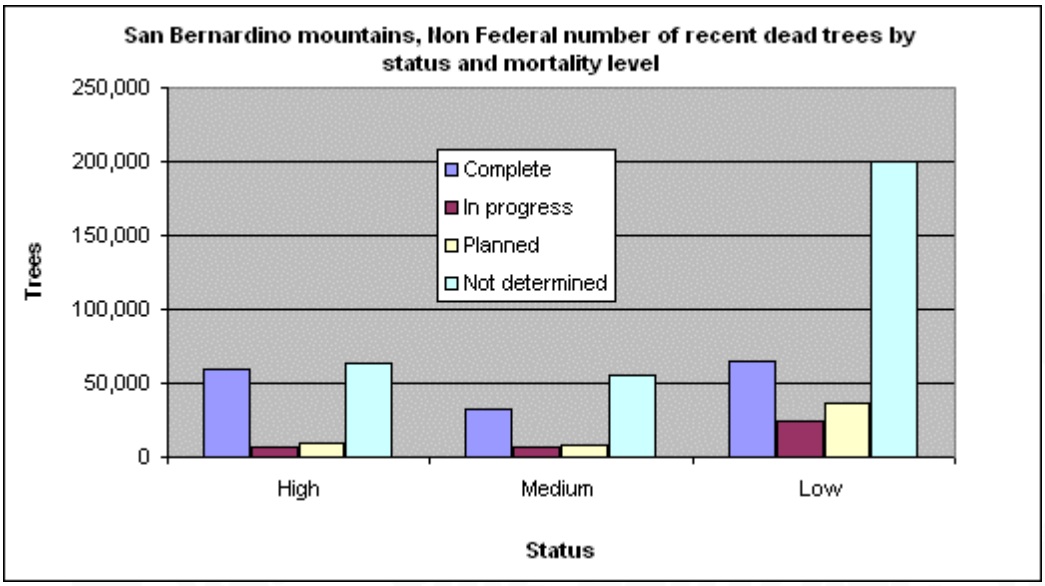


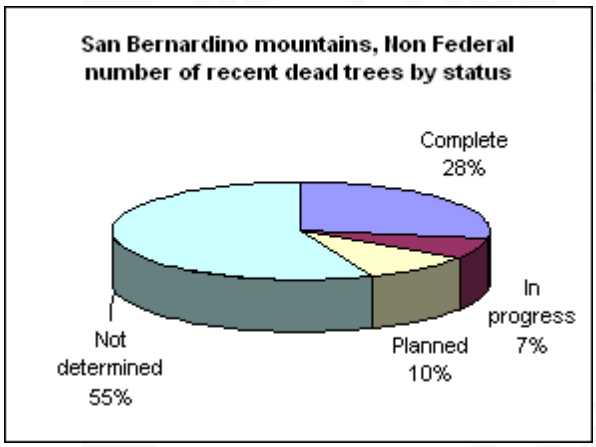


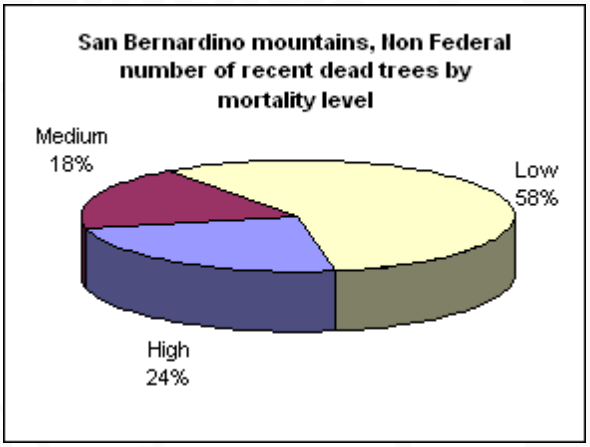


Status data: May 2005
Inventory data: Spring 2004
Vegetation Strata data: Fall 2003

Estimates of the number of recent dead trees removed by agency are based on Statistical estimates derived from 117 FIA plots re-measured in the field, and converted to per-acre estimates. Per acre estimates are then multiplied by the number of acres completed, in progress or planned. These estimates are not derived from project reports of dead trees removed, since not all agencies report this information.







Status data: May 2005
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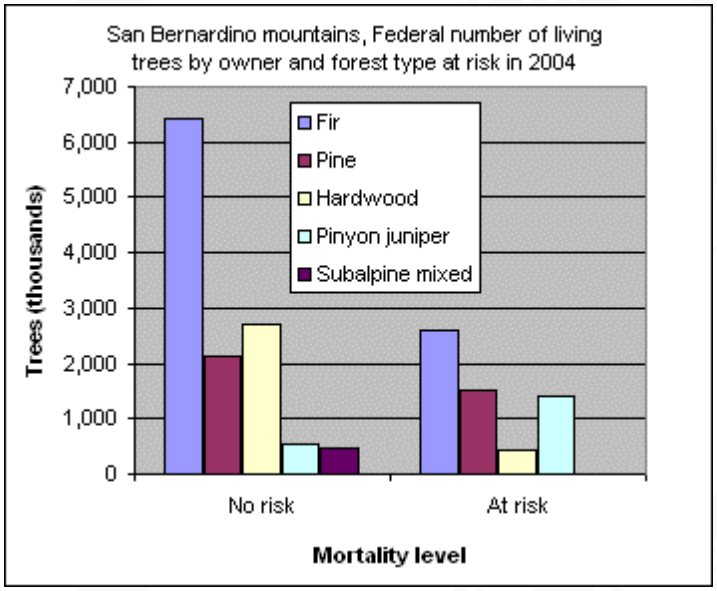
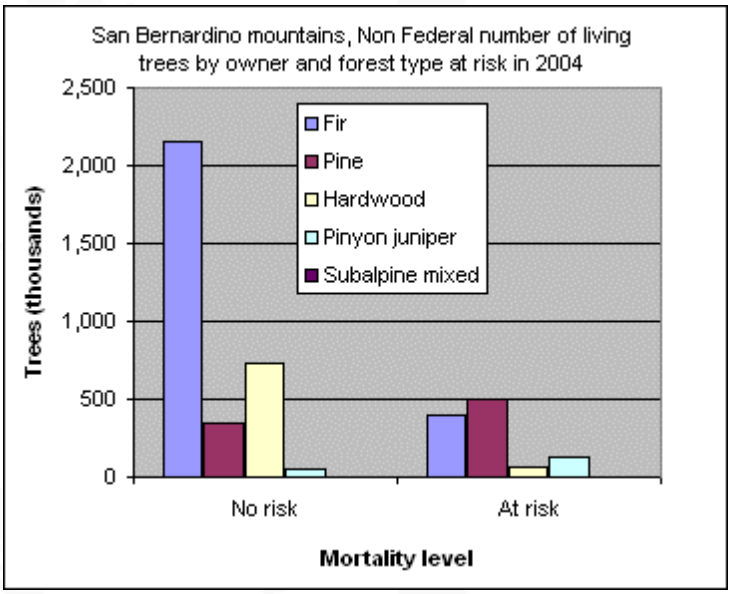
Estimates of the number of recent dead trees removed by agency are based on Statistical estimates derived from 117 FIA plots re-measured in the field, and converted to per-acre estimates. Per acre estimates are then multiplied by the number of acres completed, in progress or planned. These estimates are not derived from project reports of dead trees removed, since not all agencies report this information.

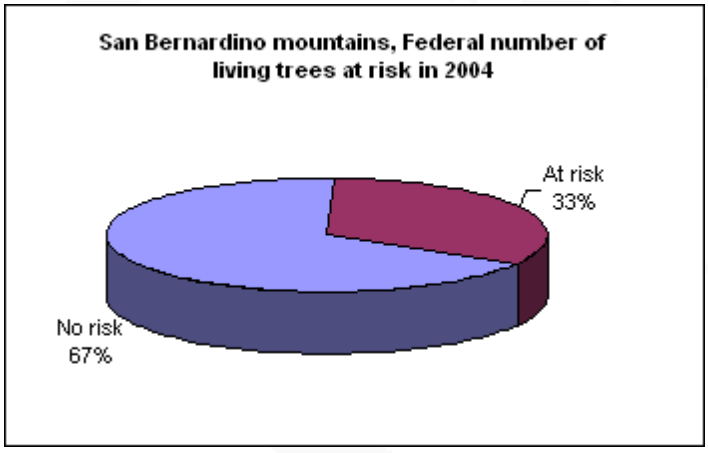
San Bernardino mountains, number of living trees by owner and forest type at risk in 2004

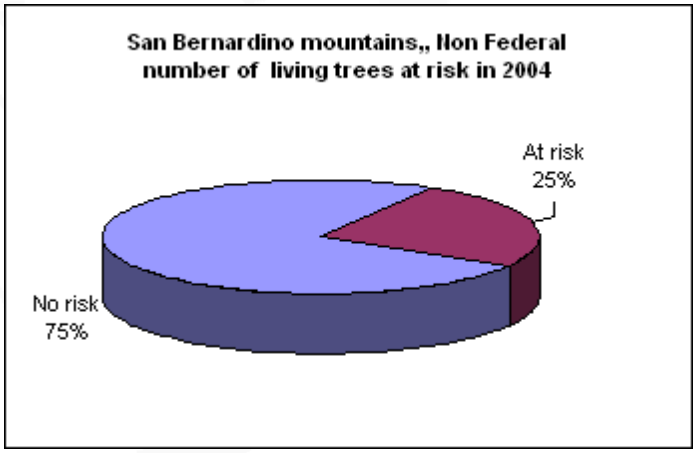
Appen.#6d

Owner	Forest type	No risk	At risk	Total
Federal	Fir	6,430,580	2,611,439	9,042,019
	Pine	2,112,125	1,510,388	3,622,512
	Hardwood	2,695,150	418,174	3,113,324
	Pinyon juniper	548,217	1,418,599	1,966,816
	Subalpine mixed	451,417	2,333	453,750
	Total	12,237,488	5,960,933	18,198,421
Non Federal	Fir	2,158,403	403,085	2,561,488
	Pine	348,402	505,296	853,698
	Hardwood	732,105	70,233	802,339
	Pinyon juniper	53,512	124,422	177,934
	Subalpine mixed	1,771	0	1,771
	Total	3,294,193	1,103,036	4,397,229
Grand total		15,531,681	7,063,970	22,595,650



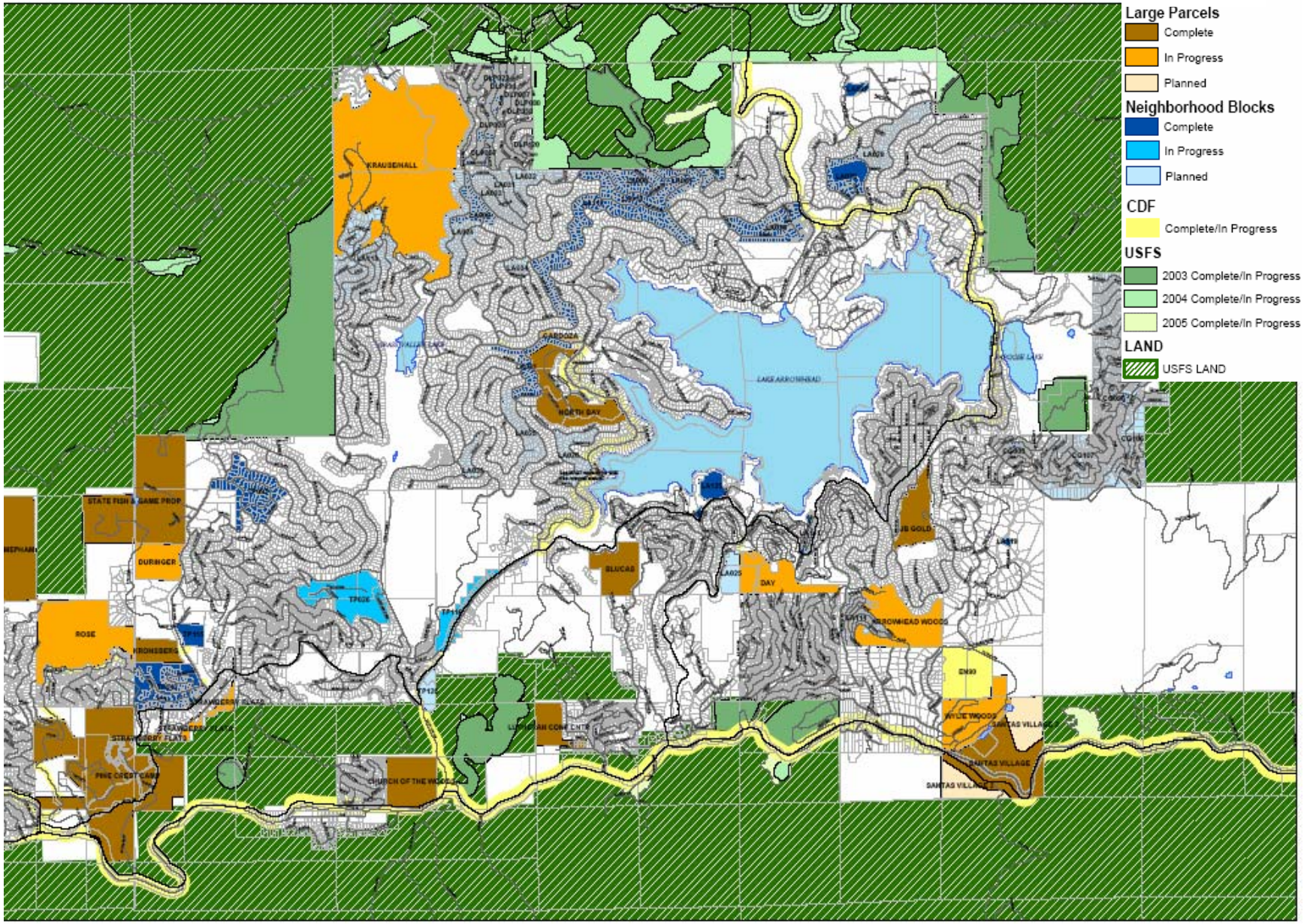


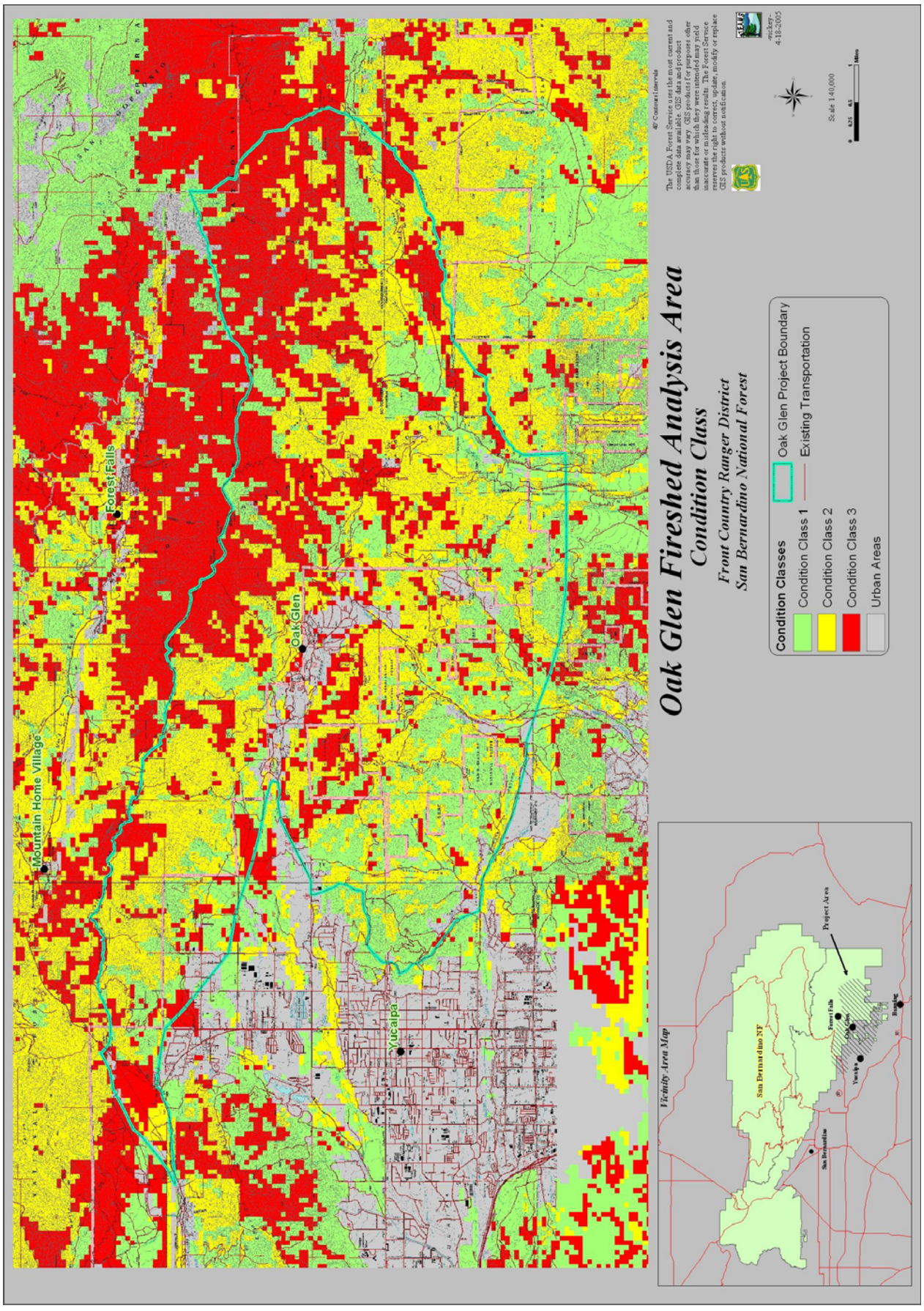


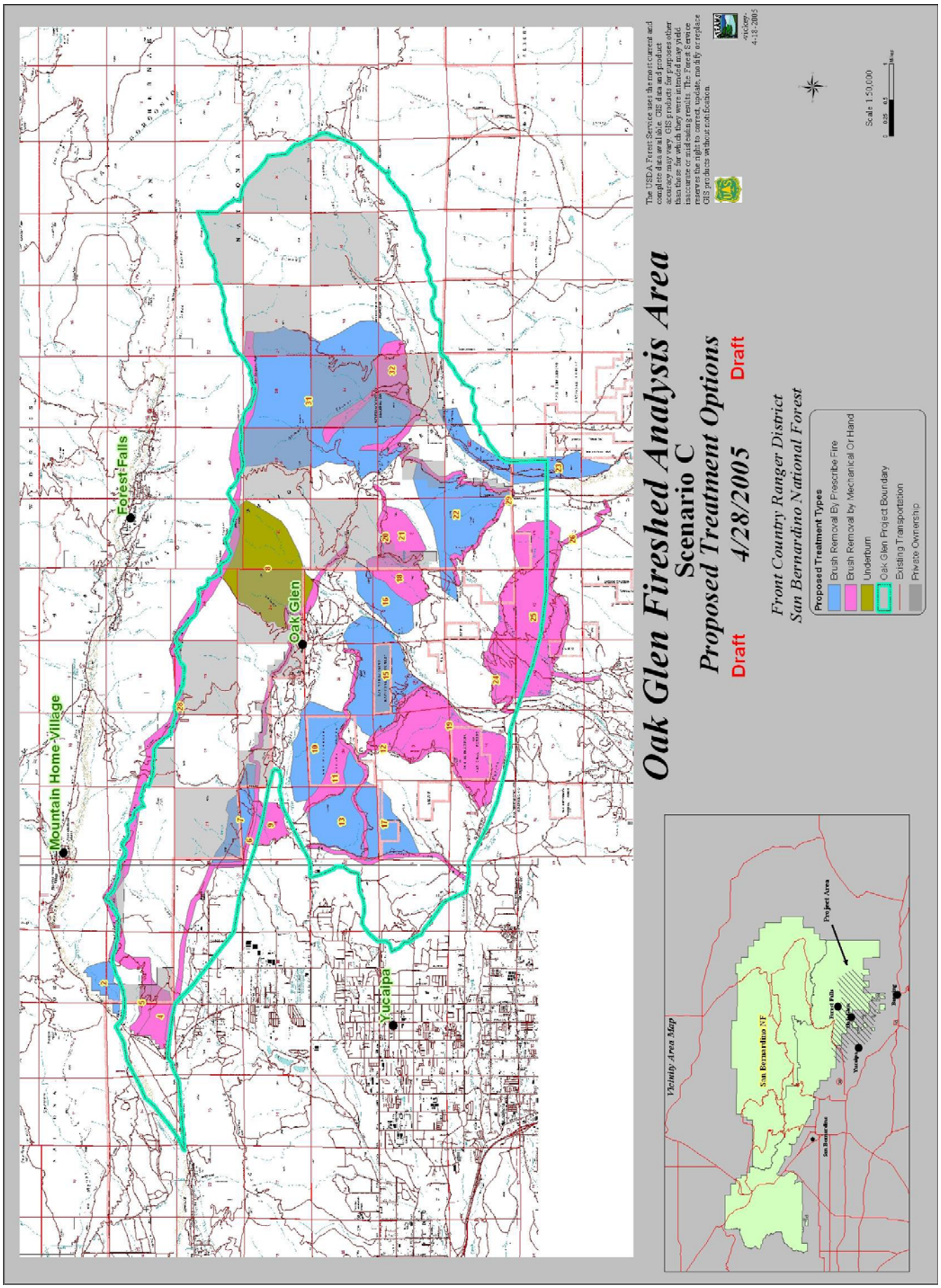


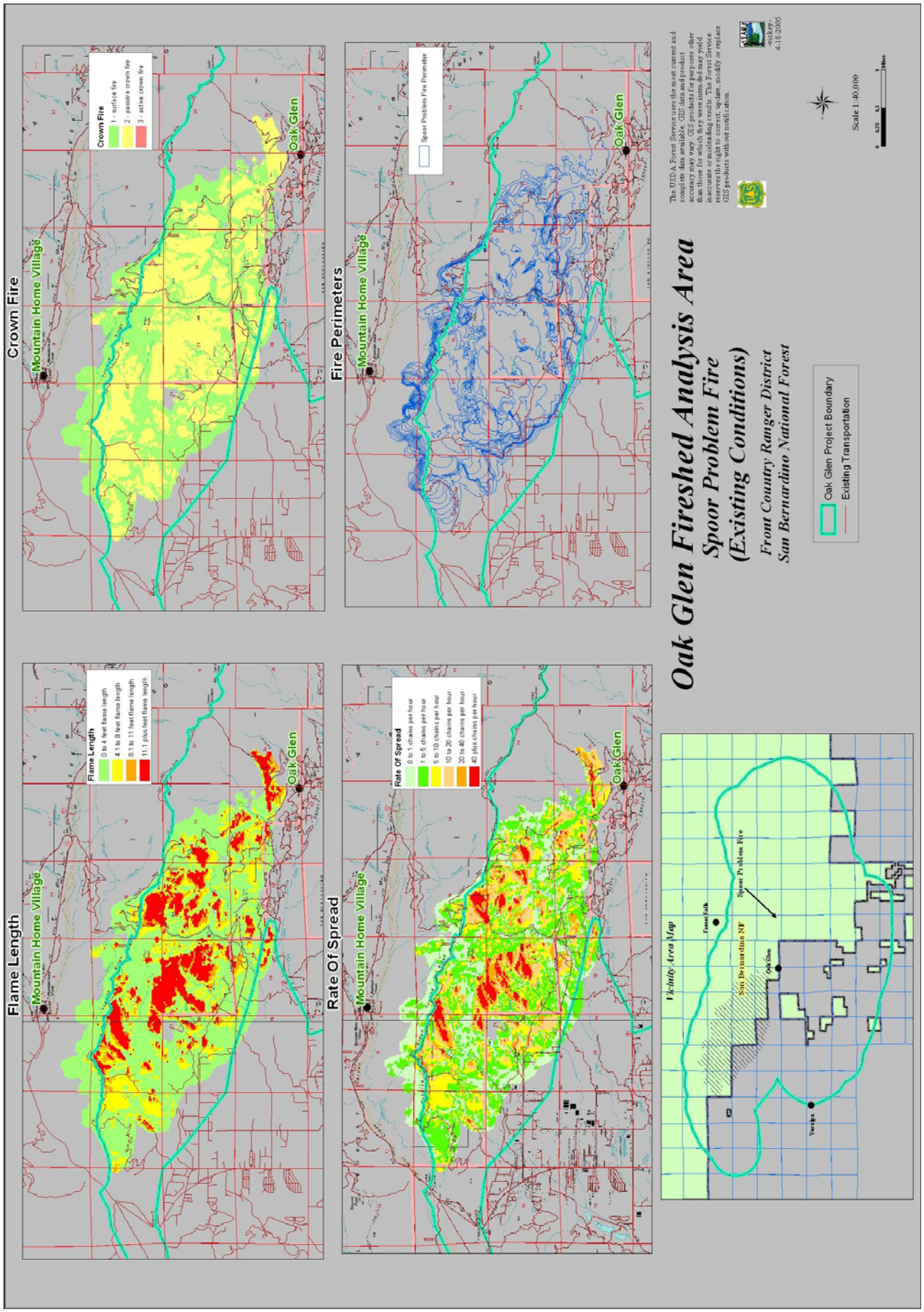
Status data: May 2005
Inventory data: Spring 2004
Vegetation Strata data: Fall 2003

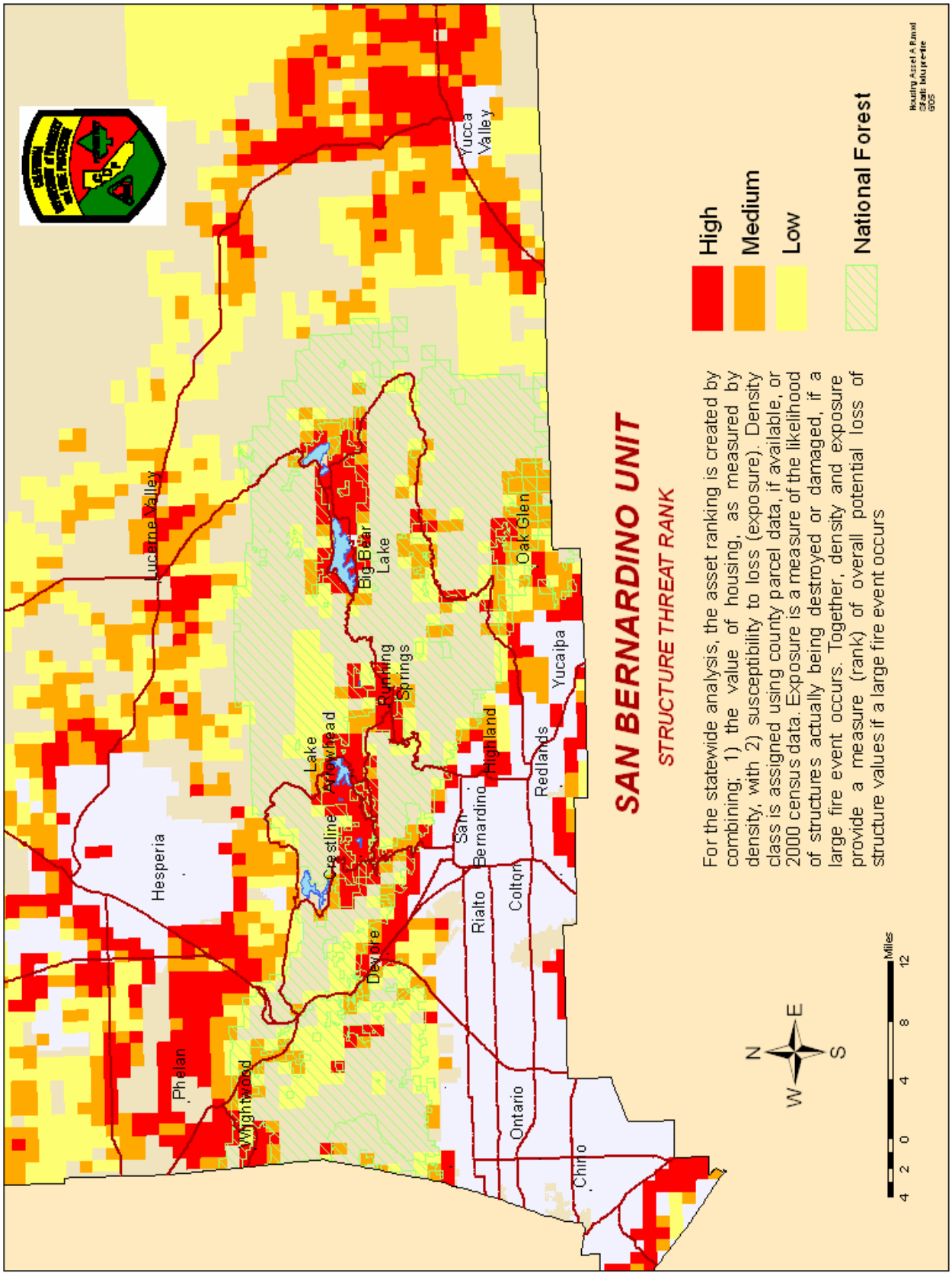
Lake Arrowhead, Twin Peaks and Cedar Glen Projects

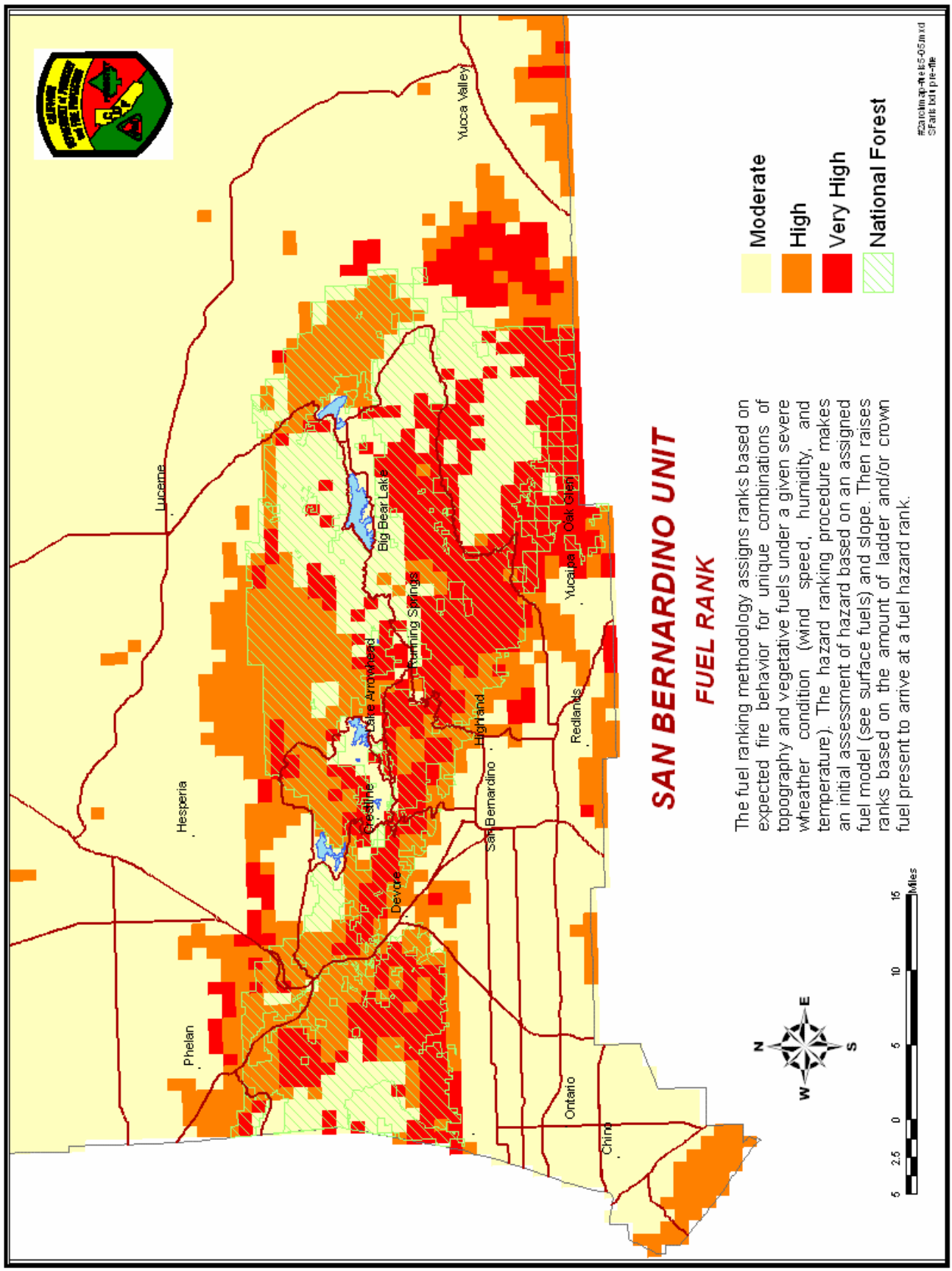



Oak Glen Fireshed Analysis Area
Condition Class
Front Country Ranger District
San Bernardino National Forest
Condition Classes
Condition Class 1
Condition Class 2
Condition Class 3
Urban Areas
Oak Glen Project Boundary
Existing Transportation
Vicinity Area Map
Project Area
San Bernardino NF
Mountain Home Village
Forest Falls
Oak Glen
Yucaipa
Scale 1:40,000


Oak Glen Fireshed Analysis Area
Scenario C
Proposed Treatment Options
Draft
4/28/2005
Draft
Front Country Ranger District
San Bernardino National Forest
Proposed Treatment Types
Brush Removal By Prescribe Fire
Brush Removal by Mechanical Or Hand
Underburn
Oak Glen Project Boundary
Existing Transportation
Private Ownership
Vicinity Area Map
Project Area
San Bernardino NF
Mountain Home Village
Forest Falls
Oak Glen
Yucaipa
Scale 1:50,000


Crown Fire
Mountain Home Village
Oak Glen
Crown Fire
1 - surface fire
2 - passive crown fire
3 - active crown fire
Fire Perimeters
Spoor Problem Fire Perimeter
Flame Length
Flame Length
0 to 4 feet flame length
4 to 8 feet flame length
8 to 11 feet flame length
11 plus feet flame length
Rate Of Spread
Rate Of Spread
0 to 1 chains per hour
1 to 5 chains per hour
5 to 10 chains per hour
10 to 20 chains per hour
20 to 40 chains per hour
40 plus chains per hour
Oak Glen Fireshed Analysis Area
Spoor Problem Fire
(Existing Conditions)
Front Country Ranger District
San Bernardino National Forest
Oak Glen Project Boundary
Existing Transportation
Vicinity Area Map
Forest Falls
San Bernardino NF
Oak Glen
Yucaipa
Spoor Problem Fire
Scale 1:40,000
The USDA Forest Service uses the most current and complete data available. GIS data and product accuracy may vary. GIS products for purposes other than those for which they were intended may yield inaccurate or misleading results. The Forest Service reserves the right to correct, update, modify or replace GIS products without notification.
4-18-2005


SAN BERNARDINO UNIT
STRUCTURE THREAT RANK
For the statewide analysis, the asset ranking is created by combining, 1) the value of housing, as measured by density, with 2) susceptibility to loss (exposure). Density class is assigned using county parcel data, if available, or 2000 census data. Exposure is a measure of the likelihood of structures actually being destroyed or damaged, if a large fire event occurs. Together, density and exposure provide a measure (rank) of overall potential loss of structure values if a large fire event occurs
High
Medium
Low
National Forest
Yucca Valley
Lucerne Valley
Hesperia
Phelan
Wrightwood
Lake Arrowhead
Crestline
Big Bear Lake
Running Springs
Oak Glen
Yucaipa
Redlands
Highland
San Bernardino
Rialto
Colton
Ontario
Chino
Devore
N
E
S
W
Miles
4 2 0 4 8 12


SAN BERNARDINO UNIT
FUEL RANK
The fuel ranking methodology assigns ranks based on expected fire behavior for unique combinations of topography and vegetative fuels under a given severe wheather condition (wind speed, humidity, and temperature). The hazard ranking procedure makes an initial assessment of hazard based on an assigned fuel model (see surface fuels) and slope. Then raises ranks based on the amount of ladder and/or crown fuel present to arrive at a fuel hazard rank.
Moderate
High
Very High
National Forest
Yucca Valley
Lucerne
Hesperia
Phelan
Big Bear Lake
Lake Arrowhead
Running Springs
Crestline
Devore
San Bernardino
Highland
Redlands
Yucaipa
Oak Glen
Ontario
Chino
N
E
S
W
5 2.5 0 5 10 15 Miles

SAN BERNARDINO UNIT FIRE PLAN

CALIFORNIA
DEPARTMENT of FORESTRY
and FIRE PROTECTION
C
D
F
FORESTRY
FIRE