# Appendix B

## Public Comments to the Draft

CENTER FOR BIOLOGICAL DIVERSITY

February 10, 2006

Dave Kehrlein
ESRI
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**RE: San Jacinto Mountains Community Wildfire Protection Plan**

Dear Mr. Kehrlein,

The Center for Biological Diversity ("Center") is a non-profit, public interest environmental organization dedicated to the protection of native species and their habitats through science, policy, and environmental law. The Center has over 18,000 members throughout California and the United States. John Muir Project ("JMP"), a project of the Earth Island Institute ("EII"), is a non-profit organization whose mission is to protect forests and native species on federal public lands from harm caused by logging activities. The JMP and EII are both membership organizations with over 15,000 members in the United States. The Sierra Club is the nation's oldest and largest conservation organization. Inspired by nature, it is working to protect our communities and planet. In California, Sierra Club has over 194,330 members and a national total of more than 773,990 members. The Center, JMP and the San Gorgonio Chapter of the Sierra Club greatly appreciate the opportunity to submit the following comments the San Jacinto Mountains Community Wildfire Protection Plan ("CWPP") on behalf of our members, staff, and members of the public with an interest in implementing effective community safety measures and protecting the native species and habitats of the San Jacinto Mountains.

The Center, JMP, and San Gorgonio Chapter of the Sierra Club strongly support the implementation of measures necessary to protect people and pets, structures including buildings and utility/transmission lines, and roads needed for ingress and egress into the communities and campgrounds of the San Jacinto Mountains. As such, we wholeheartedly agree with the recommendations regarding hazardous vegetation abatement by homeowners on page 10-10 and community evacuation procedures on pages 10-11 and 10-12.

However, we have some serious concerns with several other aspects of the CWPP as it is currently written. Specifically, the CWPP significantly broadens the currently accepted boundary definition of Wildland-Urban Interface ("WUI") in an attempt to justify unnecessary and expensive fuels treatments many miles from communities, infrastructures, and roads. Furthermore, the plan contains a number of statements and maps without any supporting documentation or disclosure of the methodology used. Finally, the CWPP omits altogether any discussion on building design and materials, which is widely recognized by fire scientists as one of the most critical factors in determining the flammability of structures

during a wildfire. The CWPP would be improved by addressing these issues. Our concerns are further detailed below.

## I. Wildland-Urban Interface (Section 4.0)

Both the Healthy Forests Restoration Act of 2003 and the U. S. Forest Service's soon-to-be-released final Land and Resource Management Plan for the San Bernardino National Forest define the WUI as a variable width up to 1.5 miles from communities at risk, or as defined in individual community wildfire protection plans. While the LRMP and the HFRA allow some leeway for communities to define their own WUI, Map-6 shows that portions of the proposed WUI in the CWPP extend up to and farther than 3 miles from the boundary of private ownership – far beyond the generally accepted 1.5-mile USFS/HRFA definition.

The CWPP states (at p. 4-1) that "during the community meetings, the need for fuel treatments miles from the nearest houses was stressed as a way to mitigate the effects of a large catastrophic fire." However, numerous members of the community expressed concern about an overly broad definition of the WUI during the workshops held in October, 2005. The CWPP's proposed WUI definition is unsupported by any data in the scientific literature regarding distance needed to create an effective community defense zone. Moreover, it is inappropriate to designate state and federally designated wilderness areas beyond a *maximum* of 1.5 miles from structures as WUI.

The CWPP uses the Cedar Fire as an example of how fast a wildfire can travel (*see* p. 4-1) as justification for significantly broadening the WUI to allow fuels treatments many miles from any infrastructures. However, the Cedar Fire burned largely in chaparral during extreme Santa Ana wind conditions, with countless firebrands blown hundreds of meters in front of a rapidly advancing fire front. In his essay 'Rethinking How We Live with Fire,' a chapter in the recently published book *Fire, Chaparral and Survival in Southern California*, fire ecologist Max Moritz wrote "as 'fire weather' gets worse (i.e., higher temperatures, lower humidity, and greater wind speeds), characteristics of fuels (i.e. amounts and spatial patterns of biomass) become less important in controlling how and where a fire may spread." He goes on to say that "under extreme fire weather conditions, such as the Santa Ana winds that occur each fall, [fuels] treatments [on the landscape] may only constrain fire spread in a minimal way – if at all – and they are not safe locations for fire suppression forces." In essence, fuels treatments are likely to do little to stop a wildfire in extreme conditions, and this must be explicitly stated in the CWPP. Keeley and Fotheringham (2005 at p. 120; *see* Exhibit A) noted that "the primary shortcoming of fire management has been the failure of fire management has been the failure to adequately convey to the public their inability to stop massive Santa Ana wind-driven fires." The CWPP must not use the Cedar Fire as an example of why the San Jacinto Mountains needs widespread fuels treatments miles from the nearest houses, as this is irresponsible and misleading to the public about the efficacy of such treatments under extreme fire conditions. Under such extreme conditions, fire-wise buildings (in terms of materials and design) and defensible space are the best answer to saving structures – and, of course, effective evacuation procedures are absolutely vital.

A review of published literature by the Center (Nowicki 2002; *see* Exhibit B) indicates that protecting buildings and communities from burning in a wildfire depends upon effective treatment of the area directly adjacent to the community. The protection of individual structures depends entirely upon the treatment of the "home ignition zone," defined in Nowicki 2002 as the building itself and the area within 200 feet of the building. Experimental studies and modeling have concluded that vegetation treatment within 40 meters (132 feet) of a building will protect it against radiant ignition from the flames of a forest fire that is torching and crowning, under severe conditions (*see* references in Nowicki 2002). U. S. Forest Service fire expert Jack Cohen stated that "my research results indicate that the big flames of high intensity wildland fires do not directly ignite homes at separate distances beyond 100 feet," (Cohen 2003; *see* Exhibit C). Therefore, a treatment zone extending 200 feet from a building will provide an extra cushion of safety to protect the building from various ignition sources in the adjacent forest.

Moreover, an additional 1640-foot "community protection zone" overlapping the home ignition zone can provide opportunities for fire-fighters to protect other flammable features of a community. Research has shown that the width requirements of the fire-fighter safety zone are related to the average sustained flame length of the forest fire flame front (different from the maximum observe flame length). The sustained flame length is calculated as twice the height of the *average* overstory tree at the site (not the maximum tree height). For example if the trees average 165 feet tall, using the 2X factor, the maximum sustained flame length is 330 feet. A calculation of four times the sustained flame length is used to determine the minimum distance required for a community protection zone under maximum conditions. Using a 4X factor, a forest fire with a sustained flame length of 330 feet requires a community protection zone of 1,312 feet, or just over ¼ mile into the forest from adjacent homes.

Creating the community protection zone involves thinning the forest to create breaks in the continuity of tree crowns (reducing crown cover to less than 35% with 10 feet of open space between crowns); pruning branches up to 10 feet high; and removing ladder fuels and small-diameter understory trees.

Beyond the immediate home ignition zone and community protection zone, vegetation management is relatively inefficient and ineffective for reducing loss of structures during a wildfire. There may be reasons to treat forests outside the community protection zone, but fuels projects in these areas should be based on scientifically substantiated ecological objectives rather than for reasons of community safety. Rather than broadly defining the WUI in the San Jacinto Mountains as the entire national forest and beyond, the CWPP should instead establish treatment zones of varying widths from the edge of communities and identify appropriate types of treatments within each zone (i.e., more intensive treatments closer to communities). The U.S. Forest Service has already taken this approach. These treatment zones would be complementary, but the objectives would be different within each zone – the farther a treatment zone is from the area immediately surrounding buildings and infrastructures, the more protection for ecological values can be incorporated into the treatment prescriptions.

In sum, the significant expansion of the WUI boundary in the CWPP beyond both the community protection zone of about ¼ mile and the larger USFS/HFRA-defined 1.5 mile buffer is not substantiated by current research on wildfire behavior.

## II. Forest Conditions and Wildfire in the Plan Area (Section 6.0)

The CWPP contains several broad, unsupported, and at times meaningless statements about forest conditions that do not serve to properly inform the public about forest and fire management. We describe our most significant concerns below.

### Chaparral Systems

The CWPP (at p. 6-1) states that "many of the areas that burned in San Diego County [during the 2003 fires] have not burned in over 80 years." Given that most of the vegetation that burned in San Diego County during the devastating fires of 2003 was chaparral, the CWPP's statement implies that the fires were driven, at least in part, by an unnatural build-up of fuels in the chaparral system due to lack of fire. The CWPP fails to provide any scientific data to support its assertion. In fact, in southern California chaparral systems do not suffer from an unnatural accumulation of fuel (Keeley and Fotheringham 2005; Exhibit A). There is currently more fire on the landscape in chaparral systems than a century ago, with a higher number of ignitions and a shorter fire return interval than occurred prior to organized fire-suppression activities (*Id*.). Furthermore, the age of chaparral has little bearing on the spread of fire in these systems during extreme conditions: the 2003 fires burned through 7-year-old chaparral as easily as it burned through 80-year-old shrublands (*Id*. at p. 118). Keeley and Fotheringham also noted that fires occurring under non-extreme weather conditions are fairly easily suppressed, so pre-fire fuels treatments in chaparral are likely to be either unnecessary under non-extreme conditions, or ineffective under extreme conditions.

In sum, landscape-level (i.e. outside the community defense zone/WUI) pre-fire fuel manipulations in chaparral systems must be closely examined in terms of their effectiveness, due to limited funding for fuels projects, the risk of spreading invasive species and converting shrublands to grasslands – a major ecological and economical issue which was not mentioned at all in the CWPP – and watershed impacts such as soil erosion and compaction. Keeley and Fotheringham pointed out (at p. 119-120) that "serious attention needs to be paid to whether or not fuel treatments are cost-effective for these fires [in chaparral]…Fuel manipulations will be most cost-effective when focused on the wildland-urban interface." The authors consider the WUI as the area immediately adjacent to communities.

### Conifer Forests

A combination of severe drought and high temperatures led to the recent outbreak of bark beetles and resulted in the widespread mortality of ponderosa pines, Jeffrey pines, white firs, incense cedars, and other tree species throughout the San Jacinto Mountains. The CWPP states (at p. 6-2) that "very high tree densities combined with an extreme incidence of tree mortality in the conifer forest…have contributed to a very dangerous fire situation." However, although dead woody fuel loads have increased due to the mortality event, thereby contributing to ignition and spread of *surface* fires, it is likely that the actual risk of severe

*crown* fire has been decreased in many conifer forests, because the spatial continuity and density of live canopy fuels has been reduced once the dead needles fall from the trees.

U. S. Forest Service research has demonstrated that crown fuels are the biomass available for crown fire, which can be propagated from a surface fire via understory shrubs and trees, or from crown to crown. Crown fires mostly burn live needles and small twigs of trees rather than the coarser stems and branches. Wind-driven crown fires are nearly impossible to suppress and can be contained only by favorable weather conditions (e.g., higher humidity, higher temperatures, and subsiding winds).

The hypothesis that risk of severe crown fire risk may be decreased due to natural crown-thinning from the mortality event appears to be supported by examining the relationship between tree mortality and fire severity in pine forests in the San Bernardino Mountains during the October 2003 Old/Grand-Prix fire, using GIS layers available from the U. S. Forest Service. The fire severity layer was generated by the post-fire BAER team, and the pre-fire mortality was estimated using over-flight aerial surveys. This analysis was conducted by the Center and JMP, and submitted to the Forest Service on numerous occasions in comment letters on fuels projects. To date we have not yet received any specific response to this analysis. While weather changes at the time the wildfires reached forested areas from the shrublands complicates the analysis, in general the data show that areas of high pre-fire tree mortality actually burned severely at *lower* rates than areas of low pre-fire tree mortality, indicating no correlation between high pre-fire tree mortality and high-severity burning (*see* Table 1, below). Thus, currently available scientific data do not support the assertion in the CWPP that drought and insect-driven mortality have increased the risk of high-severity fire into a "very dangerous fire situation." In fact, the San Jacinto Mountains have likely always experienced relatively high fire risk because the range is situated in southern California, which has some of the most extreme fire weather in the nation.

**Table 1. Acres and Percent of Pine Forest by Pre-Fire Mortality Class Burned at Different Severity Levels in the Old/Grand-Prix Fire in October, 2003. Source: September 2001 Vegetation Mortality and October 2001 Burn Severity GIS data from U.S.D.A. Forest Service.**

| Pre-Fire Mortality Class | Post-Fire Burn Severity | Acres Burned | Percent Burned |
|---|---|---|---|
| < 5 % | High | 1,757 | **53.2** |
| | Medium | 794 | 24.0 |
| | Low | 226 | 6.8 |
| | Unburned | 528 | 16.0 |
| **Subtotal** | | **3,304** | |
| 10—39 % | High | 3,918 | 54.5 |
| | Medium | 1,210 | 16.8 |
| | Low | 1,485 | 20.7 |
| | Unburned | 574 | 8.0 |
| **Subtotal** | | **7,187** | |
| 40—59 % | High | 360 | 19.0 |
| | Medium | 932 | 49.2 |
| | Low | 88 | 4.7 |
| | Unburned | 515 | 27.2 |
| **Subtotal** | | **1,895** | |
| > 60 % | High | 1,867 | **25.4** |
| | Medium | 2,237 | 30.4 |
| | Low | 3,247 | 44.2 |
| **Subtotal** | | **7,351** | |

Section 6.0 of the plan incorporates and references several maps but provides no information on methodology used to generate many of those maps. In addition, the information in some of the maps does not adequately inform the public about the issues at hand. One example is Map-20 showing tree densities, referenced in the CWPP (at p. 6-1) after the statement that intensive efforts to fight fire in the Idyllwild/Pine Cove area "has resulted in a [sic] extremely dangerous level of tree density." This map simply shows polygons of trees per acre, without further categorizing density by tree size and number of dead versus live trees. The CWPP also provides no details about the methodology used to generate the map. Similarly, Map-17 showing fire threat (plus numerous smaller-scale fire threat maps) was incorporated into the CWPP without any explanation of the methodology used to determine such threats. This information is important for evaluating the need for a particular type of treatment in a particular area.

In sum, we again stress that our organizations are not opposed to conducting fuels treatments outside the community protection zone or the USFS/HFRA-defined WUI of 1.5 miles. However, such treatments must be accomplished using scientifically substantiated ecological objectives rather than be proposed under the guise of protecting communities from wildfire (*see* discussion above about WUI). Extensive logging outside the community defense zone/1.5-mile WUI will undoubtedly incur significant ecological damage, which is well-documented in the scientific literature. Removing large live and dead trees would increase erosion, damage watersheds, and cause the invasion of weeds such as cheatgrass, which perpetuates unnaturally frequent fires. Roads needed to conduct such landscape-level thinning could actually enhance fire risk through an increase in motorized backcountry access by the general public (a major cause of forest fires). Finally, patches of dead trees, whether created by fire, insects, or disease, are extremely important habitat for woodpeckers and other snag-dependent species. Inappropriately designed fuels treatments in the backcountry will compromise the very values we care about protecting in our forest community. One example is the North Fork San Jacinto River Healthy Forests Project, in which the objectives of reducing risk of severe fire greater than 1.5-miles from the nearest human structures can and should be carefully balanced with protection of natural resources such as endangered species and water quality, lest we lose habitat in our efforts to save it.

## III. Community Preparedness (Section 9.0)

The section on community preparedness focuses on three general tactics: 1) vegetative fuel abatement; 2) insurance; and 3) evacuation. While the Center and JMP agree that these tactics are all necessary for increasing community safety and preparedness, it is widely recognized in the fire-fighting community that, in conjunction with the fuel load immediately surrounding the structure, the location of the building with respect to topography, and accessibility of the building to firefighters, building design and materials is one of the most important factors determining whether a structure will ignite in a wildfire (Radtke 2005; *see* Exhibit D).

U.S. Forest Service researcher Jack Cohen has stated that:

> "The research suggests that if the big flames are not igniting the destroyed homes then relatively low intensity fires contacting or in near contact with a home's flammable materials and/or direct firebrand ignitions must be the ignition sources. Thus, a home's characteristics, its exterior materials and design, in relation to the immediate area around a home within 100 feet principally determine the home ignition potential."
>
> (Cohen 2003 at p. 2; Exhibit C)

Fire safety expert Klaus Radtke (2005. at p. 74; Exhibit D) notes that post-fire surveys of the Rambla Pacifico area showed that "none of the homes burned in areas where National Foundation for Environmental Safety volunteers had helped homeowners understand that effective watershed management and comprehensive fire protection is not just limited to 'brush clearance.'" Radtke also provides a comprehensive list of measures homeowners can take to create a "fire-safe home." These include:

1) Brush clearance up to 100 feet.
2) Building design and materials – replacing shingled roofs with non-wood material; exterior materials consisting of stucco, metal siding, brick, concrete block, and rock; reduced overhangs or boxed eaves; under-eave vents located near the roofline rather than near the wall; exterior vents faced away from possible fire corridors and covered with < ¼ inch wire mesh; windows and doors made of thick, tempered safety glass and protected with nonflammable shutters; stone walls to deflect heat; and properly placed rooftop sprinklers or misters pumped by an independent power source.
3) Landscaping for fire safety.

No CWPP is complete without a thorough discussion and accompanying recommendations regarding building design and materials. This is an absolutely critical component of protecting communities from loss of homes and other buildings. Many additional building-design ideas are included in Klause (2005; *see* in particular figures 4-3 and 4-4). We strongly urge the CWPP to include these recommendations and provide a program to foster incorporation of these suggestions into new building designs and retrofitting of existing structures to reduce fire risks.

## IV. Conclusions

Max Moritz stated in 'Rethinking How We Live With Fire,' that "as we further rethink how to live with fire, we will require more retrofits to existing homes and neighborhoods. This will involve alterations to vegetation around structures, updates to certain building materials and designs, and better development of evacuation procedures. These fixes are necessary steps and in the right direction..." However, he pointed out the need for working together, because "if you live in a fire-prone location and do all of the hazard mitigation you can, but your neighbor does not, what has really been accomplished?" We sincerely hope that this CWPP will prompt neighbors to work together to make the necessary changes for creating a fire-safe community.

The Center, JMP, and the San Gorgonio Chapter of the Sierra Club greatly appreciate the opportunity to comment on this CWPP for the San Jacinto Mountains. Our staff and members are closely tied to this unique and wonderful southern California mountain range, and we care deeply about the safety of its human communities and the welfare of the native plants and wildlife that share these precious forests, shrublands, and waterways with us. As such, the CWPP can serve to provide much-needed guidance for how we manage fire risks throughout the San Jacinto Mountains while protecting the ecological values we treasure. Thank you for your consideration of these comments, and we hope they will improve the final document.

Sincerely,

Monica L. Bond

| | | |
|---|---|---|
| **Monica Bond** | /s/ **Chad Hanson** | /s/ **Jeff Morgan** |
| Center for Biological Diversity | John Muir Project | San Gorgonio Chapter, Sierra Club |

**List of Exhibits**

Exhibit A: Keeley, J. E. and C. J. Fotheringham. 2005. Lessons Learned from the Wildfires. Pages 112—122 in R. W. Halsey, editor. Fire, Chaparral, and Survival in Southern California. Sunbelt Publications, Inc. San Diego, CA.

Exhibit B: Nowicki, B. 2002. The Community Protection Zone: Defending Houses and Communities from the Threat of Forest Fire. Center for Biological Diversity, August 2002.

Exhibit C: Cohen, J. 2003. Thoughts on the Wildland-Urban Interface Fire Problem. Jack Cohen, Research Physical Scientist, USDA Forest Service, Rocky Mountain Research Station Fire Sciences Laboratory. June 2003.

Exhibit D: Radtke, K. 2005. Getting Ready for the Next One: Preparing for a Wildfire. Pages 72—82 in R. W. Halsey, editor. Fire, Chaparral, and Survival in Southern California. Sunbelt Publications, Inc. San Diego, CA.

February 10, 2006

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Dear Mr. Kehrlein,

As a resident of Idyllwild, I appreciate the opportunity to comment on the draft San Jacinto Mountains Community Wildfire Protection Plan (CWPP). I hope the final CWPP will guide how we manage fire risks while protecting lives, property and special natural features of these mountains which we value so much.

A number of community members contacted me wanting to know how to get a hold of a hard copy of the draft CWPP so they could look at their convenience. As you probably know, none were available for such a purpose. For some it is difficult, and for others it is not possible to read the plans on line. Not everyone has computer access, nor do they have time to sit at the library or another location to read the plan. Some people became dismayed and confused when they looked at the plan online, not understanding its intent, or how it is different from what they'd heard at various Fire Safe Council, Forest Service Management Plan, Hill Mac, and/or MAST meetings.

Community members need to see the results of their input to know they are being listened to. A meeting presenting the Draft CWPP, where it could be outlined and explained would have been helpful and people could have then gone home and "digested" it. The two week comment period was also inadequate for many. In your response to Jeff Morgan's request for a comment period extension you wrote, "Please consider that this is a community plan, not an agency plan. The action items reflect the concerns of community residents." Unfortunately, there are some community members who do not feel this way. Additionally, the online maps (particularly the Fire Threat maps) are huge, cumbersome to deal with (there's not a way to see a whole map at once) and difficult to understand.

Specific comments on the Draft CWPP:

An additional factor that changed the condition of the San Jacinto Mountains was decades of large scale logging. This practice removed old trees massive quantities and new trees grew up in even-aged stands. The forests of these mountains are not first generation forests. This should also be added into the "Executive Summary" and "History" sections.

The executive summary makes no mention of communities environmental concerns and how those concerns are being addressed/included in the CWPP.

There should be a clear definition of Wildland-Urban Interface (WUI) at the beginning of the WUI section (4-1). This section and Appendix C (C-1) also exclude the comments by community members at the Garner Valley, Idyllwild Town Hall, and Idyllwild School meetings who had questions and concerns about an expanded WUI encompassing the San Jacinto Ranger District and lands to the desert floor. Expediting the NEPA process was also a concern at these same three meetings that is not mentioned.

The concept of "mountain aesthetics" or "aesthetics" seems inadequate as it is limited to the visual appearance of our surroundings. It's not just the beauty of these mountains that visitors and residents value, but recreational opportunities, viewing wildlife, breathing clean air and drinking clean water, watching children discover nature, opportunities for solitude, adventure and rejuvenation, and even just knowing that there are

places where nature is the primary influence and we are only visitors. These are values and qualities are becoming ever more important for people in the region as urban populations continue to grow and are not represented by "aesthetics".

The sentence, "The San Jacinto Mountains have the dubious honor of having a rich fire history" (6-1) should be rephrased. Wildfires caused by lightning have historically been seasonal occurrences and a part many landscapes in Southern California, including these mountains. It is also important to recognize that we cannot fireproof the whole landscape.

Community members at the Idyllwild Town Hall and Idyllwild School meetings recommended public education regarding employing sustainable practices (landscaping with native, drought resistant and fire resistant plants) and avoiding erosion and other negative effects. Although this is listed in the "Environmental Concerns" section (11-1), it is also appropriate to add it to the section on "Community Preparedness" (9-1).

Give credit for front page photo

"This CWPP recommends aggressive fuel management" – Is "aggressive" the right word? – how about "proactive"? (1-1)

Referring to the urban population surrounding the base of the mountains - "Paradoxically, the fire threat is from the mountain, not from the urban world around it." This statement is false and misleading consider the Blaisdell Canyon fire of August 2005 near the Palm Springs Tramway. (1-2)

What is "OES"? (1-2)

Change "Idyllwild community hall" to "Idyllwild Town Hall" (3-3)

Change "Idyllwild school" to "the Idyllwild School" (3-4)

Change "manned" to "staffed" (last paragraph, 4-2 and third paragraph, 5-5)

List the lookout stations (San Jacinto Peak, Black Mountain, etc. for consistency) (4-2)

Change "Idyllwild Elementary School" to "Idyllwild School" (it's a middle school too) (4-3)

List the County owned areas (Nature Center, Hurkey Creek Park, etc. for consistency) (4-3)

Does "animals" refer to domestic animals? (7-1)

Section 7.4 unnecessarily expands on and beyond the other "values at risk". Remove all sentences after describing the viewshed. (7-1)

Under "Environmental Concerns" (11-1), the following should be listed as headers, not part of sentences:

- Wild and Scenic Rivers
- Roadless Areas, Including Wilderness and Recommended Wilderness Areas
- Wildlife and Botanical Resources

Change last part of the final sentence to read, "(landscaping with native, drought resistant and fire resistant plants) and avoiding erosion and other negative effects." (11-1)

Thank you for your time and consideration.

Respectfully,

Holly Owens
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Idyllwild, CA 92549

# Lessons Learned from the Wildfires of October 2003[1]

Jon E. Keeley and C.J. Fotheringham

The southern California fires of late October 2003 were the largest single fire event in California's recent history (figs. 6-6 and 6-7). These fires burned through a complex mosaic of urban and wildland fragments, as well as across the well-defined and extensive wildland-urban interface, destroying many lives and properties. Understanding the factors leading up to this event and the appropriate human response necessary to reduce the chances of these catastrophic impacts occurring again is the focus of this paper.

These fires burned through diverse plant communities but the amount of different vegetation types burned was not proportional to the media coverage. Thus, outside of southern California there is widespread belief that these were forest fires and this perception may have contributed to the passage of the (Healthy) Forest Restoration Act of 2004 (HR 1904). Media focus on these forest fires was undoubtedly due to the fact that they burned in unnaturally intense and spectacular crown fires in forests with important recreational value and relatively high density housing. However, coniferous forests comprised only about 5% of the total acreage burned (http://frap.cdf.ca.gov/). This is important because the factors leading up to fires and the solutions to reducing fire hazard are distinctly different in forests than in shrublands like those that dominated the bulk of the wildlands burned in the 2003 fires.

## How Do Forest Fires Differ From Shrubland Fires?

A century of fire suppression policy has been very effective at excluding fires from forests throughout the western U.S., but not from southern California shrublands. In forests, fire exclusion has been achieved for a number of reasons; mountain climates have a much shorter fire season, ignitions are commonly from lightning, weather conditions are not usually conducive to rapid fire spread, and fires typically spread by surface fuels that produce lower flame lengths. Over much of the 20th century these characteristics have led to a highly successful fire suppression practice that equals fire exclusion. Consequently, there has been an unnatural accumulation of surface fuels, coupled with increased density of young shade tolerant trees. Increased density of young trees is perhaps the most serious problem because these saplings act as ladder fuels that change fire behavior from surface fires to crown fires. As with most of our western forests, southern California conifer forests have been logged one or more times (Dodge 1975, Minnich 1988), and this may have had a greater impact on creation of ladder fuels than fire exclusion, although no one has clearly sorted out the relative contributions. Ladder fuels were certainly a critical factor in determining property damage from these recent forest fires.

Fire suppression policy in the southern California forests may also have had other indirect effects that contributed to increased fire hazard by creating conditions that

[1] This is based in part on an article appearing in the September 2004 issue of *Journal of Forestry*.



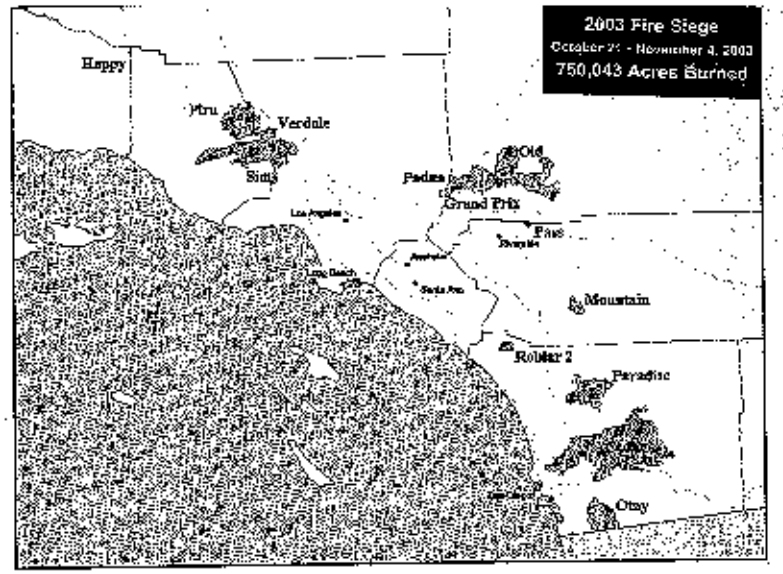


*Fig. 6-6 Fire Perimeters for October 2003 Fires in Southern California. Source: John Craney, California Department of Forestry and Fire Protection (CDF).*

| FIRE | COUNTY | ACRES BURNED | START DATE | CAUSE |
|---|---|---|---|---|
| Roblar 2 | San Diego | 8,592 | Oct. 21 | Under investigation |
| Pass | Riverside | 2,387 | Oct. 21 | Human |
| Grand Prix/Padua | San Bernardino<br>Los Angeles | 69,894 | Oct. 21 | Human |
| Piru | Ventura | 63,991 | Oct. 23 | Under investigation |
| Verdale | Ventura<br>Los Angeles | 8,650 | Oct. 24 | Under investigation |
| Happy | Santa Barbara | 250 | Oct. 24 | Under investigation |
| Old | San Bernardino | 91,281 | Oct. 25 | Under investigation |
| Cedar | San Diego | 273,246 | Oct. 25 | Human |
| Simi | Ventura<br>Los Angeles | 108,204 | Oct. 25 | Ember caused spot fire from Verdale fire |
| Paradise | San Diego | 56,700 | Oct. 26 | Human |
| Mountain | Riverside | 10,331 | Oct. 26 | Under investigation |
| Otay | San Diego | 45,971 | Oct. 26 | Human |
| Wellman | Riverside | 100 | Oct. 26 | Under investigation |

*Fig. 6-7 The 2003 Southern California Firestorm.*

greatly increased tree mortality. Estimates for some parts of the southern California San Bernardino Forest are that 3/4 of the pines were killed by a combination of drought followed by subsequent bark beetle infestation. When natural fires are excluded from conifer forests there is an unnatural increase in the density of young trees. This results in intensified competition for water between all trees, young and old. When the region experiences drought conditions, as has been the case during the past several years, mortality of all trees exceeds what would have been predicted under more natural conditions. Extensive mortality of ponderosa pine *(Pinus ponderosa)* in the San Bernardino Mountains appeared to have played very little role in the October 2003 fires only because weather conditions changed and the fire was extinguished by rain.

To reduce fire hazard in these forests there is currently a massive effort directed at extracting dead trees. While this will certainly reduce the chances for destructive wildfires it creates other resource problems. Primarily, removal of such large portions of the forest canopy creates an ecological vacuum that will be filled by aggressive alien species such as cheatgrass *(Bromus tectorum)* that has already infested other forests recently burned in this area (photo33).

## Shrubland Fires

Chaparral and related shrublands dominated most of the landscape burned during the October 2003 fires, and there is ongoing debate over whether such massive fires are natural, but infrequent events in the chaparral ecosystem, or are the result of modern fire suppression, as appears to be the case with conifer forests. The 2003 firestorm is relevant to this debate, providing an important case study that we can learn from and use to guide rebuilding efforts and future management activities.

The dominant paradigm governing fire management in southern California shrublands has long been the model that presumes fire suppression has successfully excluded fire and caused an unnatural accumulation of fuels (Minnich 1983; Minnich and Chou 1997). This model assumes that the age and spatial pattern of vegetation are strong constraints on fire spread, even during periods of extreme fire weather. These authors propose that large chaparral wildfires are modern artifacts of fire suppression and they can be eliminated by landscape scale rotational burning (Minnich and Dezzani 1991; Minnich 1998). Fire management plans for USFS national forests in southern California all have incorporated aspects of this model (Conard and Weise 1998).

However, despite heroic efforts by fire fighters during the 20th century, fire suppression policy has not eliminated fires from these landscapes, nor have fuels increased to unnaturally high levels (Conard and Weise 1998; Keeley et al. 1999; Keeley and Fotheringham 2003a; Moritz 2003). In addition there is no evidence that the frequency of large fires has changed over the 20th century (fig. 6-8). However, what has changed on these landscapes is an increase in population density and concomitant increase in fires (fig. 6-9).

An emerging view is that large fires under extreme fire weather conditions are only minimally constrained by the age and spatial patterns of fuels, and this appears to hold over broad regions of central and southern California (Moritz et al. 2004).

Southern California shrublands are an anomaly because, unlike many western U.S. forests, fire suppression policy cannot be equated with fire exclusion. The primary



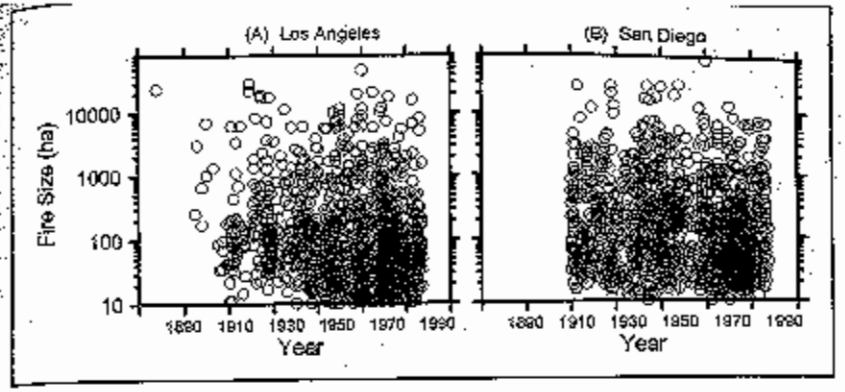


*Fig. 6-8 Size of Fires During the 20th Century in Two Southern California Counties. Hectares (ha) = 2.47 acres. (from Keeley et al. 1999).*

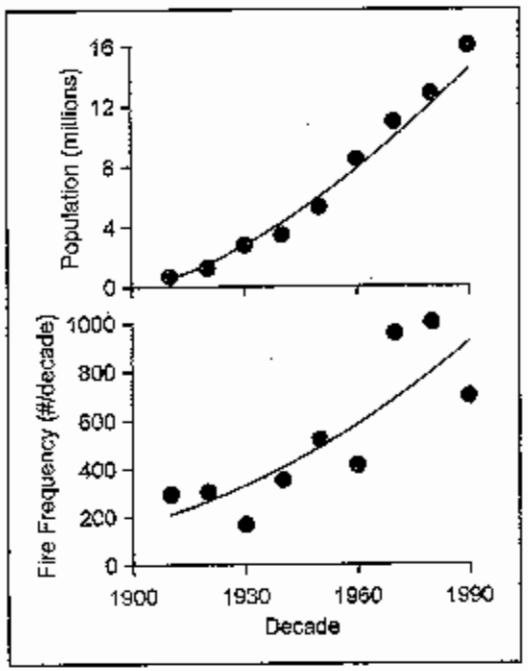


*Fig. 6-9 Decadal Changes in Human Population and Fire Frequency in Southern California (from Keeley and Fotheringham 2003).*

reason is because this region has what fire climatologists have labeled as the worst fire climate in the country (Schroeder et al. 1964). While it is generally true that massive fires anywhere in the West are accompanied by severe fire weather, in southern California these fires typically occur during the autumn Santa Ana winds. These winds reach speeds of 50-60 mph, and occur every autumn at the end of a 6 month drought. Under these conditions fire fighters are forced into defensive actions and can do very little to stop these firestorms.

Illustrative of southern California's uniqueness is the relationship between large fires and drought (Keeley 2004a). Throughout the western U.S., large fires are usually restricted to periods of extreme drought (Westerling et al. 2002). However, in southern California large fires are most likely during the autumn Santa Ana wind season and are not restricted to periods of unusual drought (fig. 6-10). Climate does appear to play a role in that it increases the length of the fire season since large summer fires are restricted to drought conditions.

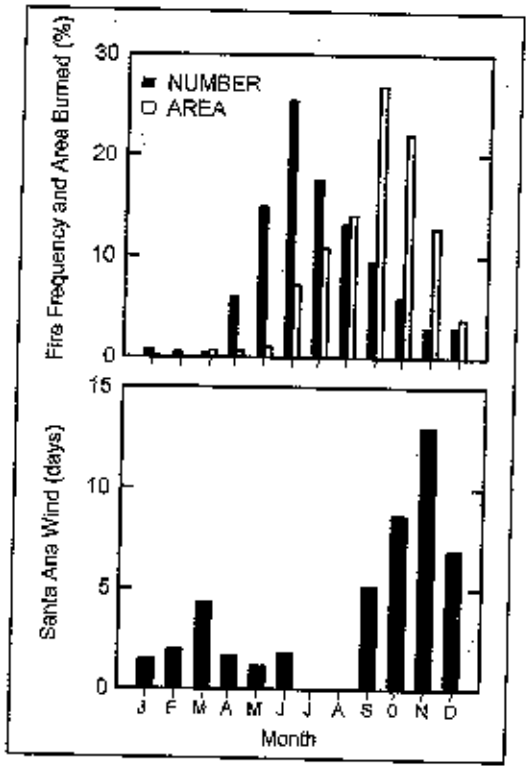


*Fig. 6-10 Seasonal Distributions of Fire Occurrence and Area Burned During the 20th Century in Los Angeles County and Seasonal Distribution of Santa Ana Winds (from Keeley and Fotheringham 2003).*



## Lessons Learned From the October 2003 Fires

Three lessons can be extracted from the 2003 fires:

1. Although these fires were massive, their size was not unprecedented, and thus we can expect similar fire events in the future.
2. The current fire management policy is not effective at preventing these massive fires.
3. Future developments need to plan for these natural fire events much the same way we currently incorporate engineering solutions to earthquakes and other natural catastrophes.

**Lesson 1:** This 2003 firestorm was a natural event that has been repeated on these landscapes for eons. For example, studies of charcoal deposition extracted from cores off the coast of Santa Barbara have found that the frequency of large fires has not changed in the past 500 years (Mensing et al. 1999). There are even Native American legends in San Diego County that support this conclusion. According to legend, hundreds of years ago there was a mass migration of local tribes due to a massive wildfire (Odens 1972). Although the recent 273,230 acre Cedar fire was the largest in California since official fire records have been kept, there are historical accounts of even larger fire events. For example, during the last week of September 1889, a Santa Ana wind-driven fire east of Santa Ana in Orange County, California reportedly burned 300 miles north and south and 10-18 miles in width (*Los Angeles Times*, September 27, 1889). This event would have been three times larger than the recent Cedar fire. Collectively, September 1889 would have exceeded all of the October 2003 burning since there was another fire that ignited that week near Escondido in San Diego County and in two days the same Santa Ana winds blew it all the way to downtown San Diego (Barrett 1935), a distance roughly equal to the long axis of the recent Cedar fire.

The primary difference between these fires is that California's population has grown about *30 fold* during this period *(http:www.census.gov)* and urban sprawl has placed huge populations adjacent to watersheds of dangerous fuels. Since over 95% of all fires on these landscapes are started by people, there has been a concomitant increase in fire frequency and increased chance of ignitions during Santa Ana wind events (Keeley and Fotheringham 2003).

The important lesson here is that massive fires have occurred at periodic intervals in the past and likely will occur again in the future. It may be more useful from a planning and management perspective to see these events as we currently view 100 year flood events or other such cyclical disasters.

**Lesson 2:** For the past several decades, southern California shrubland fire management has been based on the philosophy that fuel management practices can control the ultimate size of these massive fire events. This belief stems in large part from the fact that forests such as Southwestern ponderosa pine have had natural fire regimes perturbed by fire exclusion (Cooper 1961, Allen et al. 2001) and there are an increasing number of studies showing that fuel reduction is highly effective at reducing fire hazard. Many researchers have failed to recognize that transferring this model from natural low intensity surface fire regimes typical of forests, to chaparral, may be inappropriate. During the 1970s mathematical models of fire spread demonstrated that if fire suppression was effective at excluding fires then chaparral fires would be expected to increase

in size and intensity (Keeley and Fotheringham 2003). Managers accepted this idea and focused on fuel (vegetation) manipulation as a means of preventing large fires. The preferred treatment has long been prescription burning, applied on a rotational basis across the landscape. Theoretically fuel reduction treatments are expected to prevent large wild fires by creating fuel mosaics that include patches of young fuel, which supposedly are expected to act as barriers to fire spread.

However, over the past several decades this management philosophy has proven ineffective and in every decade the region has experienced large-scale catastrophic fires. The extent to which landscape-level fuel treatments are effective is a function of weather conditions during the fire event. Under extreme weather conditions there is overwhelming evidence that young fuels, or even fuelbreaks (fig. 6-11), will not act as a barrier to fire spread. This is quite evident in the October 2003 fires. Crossing nearly the entire width from north to south of the east-west burning Cedar fire were substantial swaths of vegetation that were less than 10 years of age, not just in one but two parts of that fire (Keeley et al. 2004). The Otay fire exhibited the same phenomenon; the fire burned through thousands of acres that were only 7 years of age (fig. 6-12). The primary reason young fuels cannot act as a barrier to fire spread under these severe weather conditions is that if the high winds do not drive the fire through the young age classes, they will spread the fire around them, or jump over them from fire brands that can spread up to a mile or more.

What is the appropriate fire management strategy? Pre-fire fuel manipulations will undoubtedly remain an important part of the southern California fire management arsenal, but their application needs to be carefully considered if they are to be effective

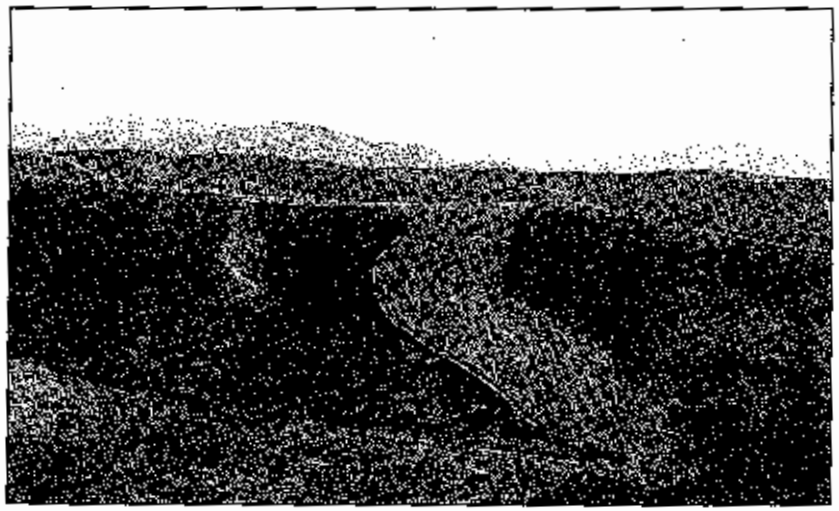

*Fig. 6-11 Fuel Break East of Scripps Ranch, San Diego County. During the Cedar fire, fuelbreaks failed to prevent the fire from spreading due to embers blowing far ahead of the fire by Santa Ana winds. Photo: J.E. Keeley*



and provide benefits equal to or exceeding their cost. For example, some fires igniting under calm wind conditions have been documented to burn out when the fire encounters young fuels, and the lack of wind limits the likelihood of fire brands jumping these young fuels. These fires, however, seldom present major problems for fire fighting crews and do not pose a major threat to the loss of property and lives. Thus, serious attention needs to be paid to whether or not fuel treatments are cost-effective for these fires.

The key to effective use of pre-fire fuel manipulations in crown-fire ecosystems such as chaparral is their strategic placement. Under severe weather, lower fuel loads will

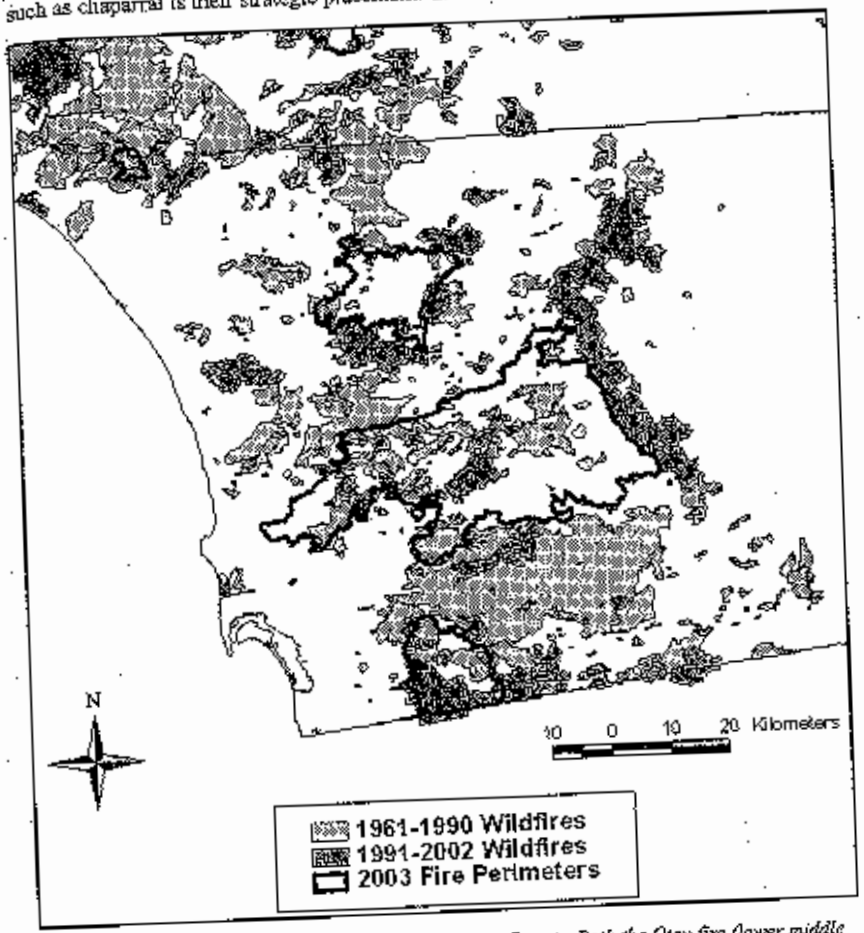


*Fig. 6-12 Historical Fire Perimeter Map of San Diego County. Both the Otay fire (lower middle dark outline) and the Cedar (central dark outline) burned through several large patches of young chaparral. This demonstrates the dominating role winds can play over fuel age in spreading fires. Paradise fire upper middle. Map created by Max A. Moritz.*

not stop the spread of fire, but they do reduce fire intensity, and thus provide defensible space for fire suppression crews. Thus, the key benefit is to enhance firefighter safety and therefore strategic placement is critical to their success. Much of the southern California shrubland landscape is far too steep to provide defensible space regardless of fuel structure, and thus fuel manipulations in these areas are unlikely to provide economically viable benefits. Fuel manipulations will be most cost-effective when focused on the wildland-urban interface. Often times during severe fire weather homes are lost because fire fighters refuse to enter areas that lack a sufficient buffer zone of reduced fuels to provide defensible space. In terms of management goals, the metric for fuels treatments on these shrubland landscapes needs to change from simply measuring "acres treated" to consideration of their strategic placement, and this change in management philosophy is being recommended by the largest National Park Service unit in southern California (see M. Witter and R. Taylor above in *Preserving the Future: A Case Study in Fire Management and Conservation from the Santa Monica Mountains).*

Fuel manipulations, in particular rotational prescription burning, may have some beneficial impacts on post-fire events since younger fuels are associated with reduced fire severity, and this may affect both vegetation recovery and sediment losses. Extensive studies of post-fire recovery following the 1993 fires in southern California found that the impact of high severity fires was variable, with both positive and negative impacts on post-fire recovery (Keeley 1998a). Thus, it would be premature to at this point conduct expensive fuel treatments with the expectation of producing major changes in post-fire recovery.

Recent studies of sediment loss from chaparral watersheds have shown that rotational burning at 5 year intervals has the potential for greatly decreasing the immediate post-fire sediment loss (Loomis et al. 2003). However, in the long run this may not be cost-effective for several reasons. One critical determinant of sediment loss is the first winter precipitation, high rainfall years being particularly damaging. Prescription burning at 5 year intervals greatly increases the chances of fires being followed by an El Niño year of high rainfall, relative to fires at the normal return interval of 35 years. In addition, the cumulative sediment loss over the long term would be much greater for 5 year burning intervals since there would be multiple peak discharges over the normal 35 year interval. Perhaps most importantly, burning at 5 year intervals will almost certainly effect type-conversion to alien grasslands (Keeley 2004b), which in addition to having negative resource impacts, would greatly increase the chances of slope failure in many of these very steep watersheds.

**Lesson 3:** Californians need to embrace a different model of how to view fires on these landscapes. Our response needs to be tempered by the realization that these are natural events that cannot be eliminated from the southern California landscape. In this respect we can learn much from the science of earthquake or other natural disaster management. No one pretends they can stop them; rather they engineer infrastructure to minimize impacts.

The primary shortcoming of fire management has been the failure to adequately convey to the public their inability to stop massive Santa Ana wind-driven fires. For much of the past half century public agencies have had a false belief that how or where they allowed new developments was irrelevant to fire safety because of assurances that fire managers could prevent fires from burning across the wildland-urban interface. Undoubtedly there has been substantial pressure on fire managers to convey an overly confident image, and not to highlight their limitations. These recent fires should be recognized as a wake-up call to the fact that there are inherent limitations to containment of Santa Ana wind-driven fires.

Some newspaper accounts have suggested that the conservation planning efforts in southern California contributed to the devastation caused by the fires by allowing the close juxtaposition of developments and natural habitats. While there may have been isolated instances where this was the case, there is evidence that effective preserve design assisted in reducing the loss of human life and structures. The overriding goal of habitat management planning is to create areas large enough to provide contiguous habitats that are not infringed upon by development. This goal is consistent with increasing fire safety for the public. The best example of where this planning process worked well is the Otay fire, which burned a substantial portion of a contiguous habitat management area, yet no structures or lives were lost. Allowing development on an "island" within this preserve would have meant setting structures within indefensible boundaries.

## Conclusions

Chaparral is the most extensive vegetation type in California, covering over 8.5 million acres of the most heavily populated state (35 million people) in the union. Massive high intensity wildfires are a normal feature of this ecosystem, creating situations lethal to the expanding human population on these landscapes. Over the past several decades urban sprawl has placed more and more people at risk and added to the human and financial losses at a scale that dwarfs wildfire impacts in other parts of the country. Indeed, since 1970, 12 of the nation's top 15 most destructive wildfires have occurred in California, costing the insurance industry $4.8 billion (Miller 2004).

Unlike western U.S. conifer forests, where fuel reduction projects show promise of reducing the incidence of large wildfires, analysis of the factors leading to catastrophic chaparral fires indicate limited ability of managers to prevent such events. Thus, we need to plan for other massive wildfires on the southern California landscape. Fire management activities cannot prevent these large fires, however, through a combination of buffer zones and better planning, we may be able to engineer an environment that minimizes their impact on property and lives.

There are two important realities to fuel management at the wildland-urban interface that will potentially cause problems in the future. One is the increasing complexity of land ownership and different management goals of neighbors. Fuel clearances necessary to ensure structure survival may not always be possible because of alternative management goals by neighbors. Perhaps a bigger problem is the skyrocketing cost of managing vegetation to reduce fuel loads, illustrated by the recognition that such treatments in many western U.S. forests may need to remove larger commercially valuable timber in order to pay for them. However, extraction of commercial products is not an option for chaparral shrublands, and thus some creative thinking will be required in order to pay for

the necessary buffer system needed to protect urban developments. An important area for future research is the use of normal features of development infrastructure as buffers. For example, in southern California many new developments are built around golf courses or recreational parks. However, placing these on the periphery could act as an important barrier to fire spread. Making these designs part of the developers responsibility would have value added in that it would encourage less fingering of developments into dangerous wildland fuels because such configurations would increase the costs of buffer zone construction.

# The Community Protection Zone: Defending Houses and Communities from the Threat of Forest Fire

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***August 2002***

***Summary***

The protection of houses and communities from the threat of forest fire depends upon the proper treatment of the wildland-urban interface (WUI), the area directly adjacent to houses and communities. The protection of the house depends entirely on treatment of the home ignition zone—the house itself and the area within 60 meters (200 feet) of the house. This is necessary to protect the house from the various forms of ignition present during forest fires, regardless of what treatments are implemented in the adjacent forest. In addition, an overlapping community protection zone can provide opportunities for firefighters to protect other flammable features of a community. The largest community protection zone required under maximal conditions is less than 500 meters (1640 feet) wide. However, most communities require treatment extending less than 400 meters (1312 feet) from the house.

***Introduction***

Current efforts to protect communities from the threat of forest fire are being planned without consideration for what is actually effective at protecting houses and communities from forest fires. Considering the current risks and the limited resources available for the implementation of fuels reduction projects, individual projects and strategic plans need to utilize the best available science to develop the most effective and efficient methods for protecting houses and communities. At the same time, the focused treatment of the WUI is necessary in order to avoid inadvertently damaging adjacent forest ecosystems and wildlife habitat with poorly planned and ineffective projects. This paper includes an extensive review of all the available scientific literature in an effort to determine what is actually necessary and effective at protecting houses and communities from the threat of forest fire. WUI treatments that provide effective protection from forest fires can be implemented relatively quickly in and around the homesite (the house and its immediate surroundings), and with a minimum of impact on the wildland forest.

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### *Protecting the House*

Effective fire protection eliminates opportunities for ignition of the house: a structure that does not ignite does not burn, regardless of what occurs around it. Forest fires can ignite houses in three ways: 1) flames of the burning forest can provide enough radiant heat, without reaching the house directly, to ignite the surface of the house; 2) flames of the burning forest can reach the surface of the house through surrounding vegetation; and 3) firebrands (burning embers from a fire) can be carried by wind to fall on or near the house. The first of these threats can be effectively treated by breaking up forest fuel continuity within a maximum of 60 meters of a house; the second requires removal of vegetation immediately adjacent to the house; and the third is addressed by treating the house itself.

In order for a forest fire to ignite a house without reaching it directly, the fire must provide sufficient radiant heat for long enough to raise the temperature of the surface of the house to its ignition point. Experimental studies and modeling have shown that partial removal of trees within 40 meters (132 feet) of the house protects it against radiant ignition from the flames of a forest fire that is torching and crowning (Cohen and Butler 1998, Cohen 2000a). These studies assumed severe conditions, and lesser distances may suffice. Another study (Davis 1990) found a precipitous drop in structural ignition with a distance of only 20 meters between the house and forest vegetation. Therefore, a treatment extending 60 meters (200 feet) from the house provides a margin of safety to account for particularly steep slopes or tall trees, and protects against scorching of exterior walls.

The number of trees that must be removed is a function of site-specific factors. The goal of the treatment is to break up any flame front sufficiently that radiant heat is not great enough to ignite the surface of the house over the duration of the exposure to the flame front. This does not require the removal of all vegetation within the home ignition zone. In fact, trees that are adequately spaced from the house and the surrounding forest can provide heat protection by blocking the radiating heat of the forest fire. Vegetation with the potential to produce smaller flames can safely be located relatively close to the house (Cohen and Butler 1998).

Even when the house is protected from the intense heat of the flame front, there is a serious threat of the house igniting from direct contact with flames from nearby shrubs, firewood, or even dried grass and needle litter. In fact, a large proportion of the houses that burn during forest fires do not ignite from intense crown fire, but from a relatively low-intensity surface fire (Cohen 2000b). Fire can burn grass and needle litter right up to the surface of the house, or ignite a tree, shrub, or structure (such as a deck or shed) near the house. A minimal break in the continuous surface fuels (such as a simple rake line around the perimeter of the house) can be effective in preventing direct ignition (Cohen 2000b). For this reason, homesite protection includes eliminating continuous ground fuels that lead from the forest to the house. This can be accomplished with rock landscaping, cement sidewalks, green grass, or by raking away needles and dried vegetation.

The most dispersed source of home ignition is firebrands, burning embers generated by the forest fire. Firebrands can be lifted high into the air and carried by wind to ignite fires miles ahead of the forest fire. They can be blown onto the roof of the house or into any exposed flammable area, causing fires that can ignite the house even if the forest fire is miles away. Therefore, firebrands are an extremely dangerous source of ignition on and adjacent to houses (Cohen and Saveland 1997). Even highly effective fire prevention or suppression miles from the homesite, cannot adequately protect houses from this threat of ignition. Similarly, WUI treatments that neglect to treat the houses will be dangerously ineffective at protecting houses and communities from firebrand ignitions.

Because of the threat of firebrand ignitions, reducing the flammability of the house itself is absolutely necessary, regardless of the vegetation treatment in the surrounding forest, and regardless of the distance between the house and the adjacent forest. These basic treatments are essential elements in any community protection plan. In general, treating the house against firebrands involves using fire-resistant materials in the building of the house and adjacent structures, especially roofs and wooden decks; covering or removing flammable materials from corners and nooks where firebrands can accumulate; and clearing roofs and gutters of dead branches, leaves and needles.[1]

### *Community Protection Zone*

Additional thinning beyond the home ignition zone may enhance the ability of firefighters to safely defend community space. Creating an area of reduced fuels immediately adjacent to the community can provide options for firefighters to control fire in this space, and can provide a safety zone- and area where firefighters are "free from danger, risk, or injury"(Beighley 1995). This requires breaking up fuel continuity at greater distances from houses than necessary to protect the homes themselves, because injury to humans can occur with a fraction of the heat and time required to ignite wood (Cohen and Butler 1998).[2]

Experimental studies and modeling have shown that the width requirements of the firefighter safety zone are related to the average sustained flame length of the forest fire flame front at the edge of the safety zone (Butler and Cohen 1998). The sustained flame length is significantly different from the maximum observed flame length, which includes tall flame bursts that do not produce heat of the same magnitude as sustained flames. The calculations in this paper approximate the maximum potential sustained flame length as

[1] Three public agencies in the West provide information to homeowners on how to treat their house and property to protect them from the threat of forest fire. The National Wildland/Urban Interface Fire Program (Firewise) and the California Department of Forestry both recommend that homeowners remove hazardous fuels within 30 feet of the house. The Colorado Department of Forestry provides the following recommendations: remove all flammable vegetation from within 15 feet of the house, and create a defensible space of reduced fuels extending 75 to 125 feet from the house. The treatments described here surpass all of these, and include recommendations by the US Forest Service Fire Sciences Laboratory (Firelab).

[2] The calculations are based on a burn injury limit of 7 $kW/m^2$ (Braun et al.1980, Butler and Cohen 1998; 2000). Human burn injury limit is the amount of heat required to injure a firefighter not using a personal fire shelter, over the duration of a flame front during a forest fire.

twice (2X) the height of the average overstory tree at the site (not to be confused with the maximum tree height). These calculations use the maximum possible values for every variable so that the results far over-estimate the actual physical requirements for community protection zone. In effect, the calculations below incorporate a large safety factor by adopting a strong bias toward maximum values, including the range of high winds and steep slopes, whether or not such conditions are present or physically possible.

The great majority of WUI communities in the West are surrounded by trees between 10 and 50 meters (33 and 165 feet) tall. Using a 2X factor, the maximum sustained flame length for a tree 50 meters (165 feet) tall is 100 meters (330 feet). A calculation of four times (4X) the sustained flame length is used to determine the minimum distance required for a community protection zone to effectively act as a safety zone under these assumptions of maximum conditions (Butler and Cohen 1998). Using a 4X factor, a forest fire with a sustained flame length of 100 meters (330 feet) requires a community protection zone 400 meters (1312 feet, or approximately ¼ -mile) wide.

There are extremely few communities surrounded by forests that consist of trees with an average height greater than 50 meters (165 feet), and it is highly unlikely that trees of any height can produce sustained flame lengths greater than 100 meters (330 feet). However, the maximum possible treatment to create a community protection zone was determined by assuming an average overstory tree height of 60 meters (200 feet). A community protection zone in such a forest could conceivably require a treatment 480 meters (1600 feet) wide.

It is important to note that creation of community protection zone does not require the removal of all trees within the area. It involves thinning the forest to create breaks in the continuity of tree crowns, and removing ladder fuels and small-diameter understory trees. Of course, the community protection zone treatment is dependent on the site conditions, such as forest type, average tree height, and slope. Rules of thumb recommend reducing crown cover to less than 35%, with a minimum of 10 feet of open space between crowns; pruning branches up to 10 feet high; and removing small-diameter understory trees or spacing them the same as the overstory trees (Anderson and Brown 1988, Schmidt and Wakimoto 1988). It is important to retain trees, particularly large, fire-resistant trees, in the community protection zone, because trees suppress the growth of highly flammable brush, limiting the amount of vegetative maintenance needed, as well as reducing wind speeds, and blocking heat from the forest fire.

A properly implemented community protection zone treatment can reduce the area required for the home ignition zone treatment described in the previous section. The distance requirement for the home ignition zone treatment is based on the assumption of a continuous, uninterrupted flame front. However, the community protection zone treatment breaks up the forest fuels facing the house, decreasing the ability of the flame front to provide enough heat to ignite the house. Nonetheless, the community protection zone is not a replacement for treatment in the home ignition zone. Treatment of the home ignition zone is an integral and critical component of an effective community protection

zone. That is, the community protection zone will not be effective without implementing the homesite treatment.

### *Firefighting Strategy*

It is important to note that the strategy proposed in this paper differs from the strategy proposed by Cohen (2002). Cohen recommends that the house and the immediate surroundings be properly treated before a forest fire occurs, and immediately following a forest fire, firefighters and homeowners can focus on extinguishing fires ignited by firebrands and other small fires as they occur. If necessary, the firefighters can move to a safe stand-by location as the fire front passes, and then return to the houses immediately afterward to suppress any subsequent fires.

The strategy proposed in this paper includes the assumption that some communities will choose to place firefighters along the boundaries of the community, regardless of the fact that such action may not increase the survival of houses. However, the strategy proposed in this paper does not preclude the opportunity for firefighters to remove to a safe stand-by location. Consequently, firefighter safety also requires that homeowners appropriately treat their houses and properties. Even though the flames from a burning house may not be nearly as high as those produced in a forest fires, a house will burn much longer than the duration a forest fire burns in one location, and a burning house can create a serious threat of ignition to a neighboring house (Cohen and Butler 1998). Because firefighters should not be caught between a burning forest and a burning house, fire management agencies should perform assessments of all individual houses before determining that a neighborhood is a safe and appropriate area in which to work during a fire.

### *Beyond the Community Protection Zone*

Vegetation management beyond the structure's immediate vicinity has little effect on house ignitions (Cohen and Saveland 1997). Cohen (1999) stated, *"The evidence suggests that wildland fuel reduction for reducing home losses may be inefficient and ineffective. Inefficient because wildland fuel reduction for several hundred meters or more around homes is greater than necessary for reducing ignitions from flames. Ineffective because it does not sufficiently reduce firebrand ignitions."* In short, a properly implemented homesite treatment provides complete protection for the house; a fireline in the community protection zone can provide additional protection against encroaching ground fires that can ignite houses if the home ignition zone treatment is not properly implemented; and treating the forest beyond the community protection zone provides no additional protection for houses or communities. Certainly, there are reasons to treat the forests outside the WUI, but such forest restoration projects should be based entirely on ecological objectives, which may include forest health improvement and fire risk reduction.

### *Maintaining the WUI*

The more tree thinning is used to treat the WUI, the greater the need for near-term precautions against fire hazard and for long-term maintenance. Thinning greatly increases the immediate fire hazard because it creates a large amount of highly

flammable slash and debris, and the open forest structure produces conditions in which there are drier and warmer surface fuels, and higher wind speeds. This increased fire hazard must be mitigated as soon as possible following the thinning operation. This can only be accomplished by reducing surface fuels and debris, and the most efficient and effective methods may be prescribed burning, or chipping followed by removal of the remaining fuel. Some sites may require an initial pile burn followed by a broadcast burn. In other cases, it may be necessary to utilize an incremental approach, in which a series of prescribed burns is used to remove fuels.

Subsequent prescribed broadcast burns may also be the most efficient and effective for maintaining the WUI treatment over time. Such burning would maintain lower fuel loads within the forest, as well as reduce the growth of highly flammable shrubs and understory trees. Regular (possibly annual) maintenance is critical for maintaining the community protection zone.

### *Prioritization*

The US Departments of Agriculture and Interior defined the interface community as having a population density of 250 or more people per square mile, and the intermix community as having 28-250 people per square mile (USDA/USDI 2001). While this should certainly not be taken as any hard definition, it does serve as a guideline for the prioritization of projects. The WUI communities can be categorized as interface (neighborhoods extending into the forest), intermix (groups of houses within the forest), and individual properties (isolated inholdings) within the forest, and can be prioritized in this order by relative risk to lives and property, and by relative amount of protection gained from each project.

Interface communities contain the greatest number of houses and people per square mile. Furthermore, because of the relatively dense development and extensive road systems in interface communities, WUI projects involve a relatively small area per house and are relatively easy to implement. Therefore, WUI projects for interface communities can provide the greatest protection for the greatest resources (houses and people) with the smallest amount of time and effort, and should be prioritized for extensive projects. This is not to say that all WUI communities and houses should not be protected from the threat of forest fire. Certainly, homesite treatments should be implemented as soon as possible on all WUI communities and houses. This would provide immediate and complete protection for the houses until the site can be assessed for the implementation of a community protection zone treatment.

### *Conclusion*

A focused treatment of the wildland-urban interface can provide houses and communities with real and effective protection from the threat of forest fire. Treatment of the home ignition zone—the house itself and the surrounding area up to 60 meters from the house—provides the house direct protection to from the various ignition sources of a forest fire. The treatment of the homesite alone can effectively protect the house from the threat of forest fire, regardless of what other treatments are implemented in the WUI. Creation of a community protection zone can provide an additional safety zone where

firefighters can safely defend flammable features of a community other than the buildings alone. This community protection zone does not require the removal of all trees, and entails treatment for less than 500 meters from the house.

The highest priority should be given to WUI projects that protect interface communities (neighborhoods extending into the forest). Such projects can provide the greatest protection for the greatest resources (houses and people) with the smallest amount of time and effort.

**Citations**

The U.S. Forest Service Intermountain Fire Sciences Laboratory, based in Missoula, Montana, is responsible for the majority of the most recent research regarding the physical effects of forest fires on houses and structures. Many publications by the Fire Lab staff can be read or downloaded on the website www.firelab.org.


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Re the San Jacinto Mountains Community Wildfire Protection Plan, January 2006
Draft prepared for the Riverside County Mountain Area Safety Taskforce

As an Idyllwild resident (full-time for 14 years, part-time prior for fourteen years) and hiker of local trails, I have attended many USFS information meetings, including the Mountain Summit at Redlands University and the community sessions for this Plan in October 2005. I find this CWPP draft quite informative and thoroughly covering the topics listed in the Executive Summary and Goals. Certainly everyone living, working or visiting in our beautiful San Jacinto Mountains is very concerned about the wildfire threat to this fire-prone region. I personally appreciate the effort put into this plan and the ability to make comments.

For additional description, I would suggest adding to the community descriptions on pages 5-4 thru 5-8: a listing of the various private camps in the mountain area as it appears that all of these entities are not included: (no doubt known to fire agencies)

Girl Scout Skyline Camp
Girl Scout Camp Azalea Trails
Girl Scout Camp Joe Sherman
Boy Scout Camp Emerson
Apple Canyon Center
Pines Springs Ranch
Pathfinder Ranch
Zen Mountain Center
Tahquitz Pines
Thousand Trails Resort
Silent Valley Resort
Idyllwild Pines
Camp Maranatha
Astrocamp
Alhatti Christian Resort
Buckhorn Camp
Camp Alandale

Also: Lake Hemet Campground, and all the USFS, State Park and Riverside County Open Space and Park District campgrounds on the mountain.

I am not certain if the Idyllwild Arts Academy/Summer Program was mentioned in the CWPP, of course the public Idyllwild School was.

The various comments made by attendees at the community meeting regarding evacuation are of special interest to me as I am a local Red Cross volunteer (currently recruiting additional volunteers for our local Disaster Action Team). I would like to see "Red Cross" described as Riverside Chapter American Red Cross. Our mountain area is under the Temecula office of the Chapter.

And because there is a large number of older, retired people living in our communities, I would think that the County Office of Aging and the HELP Center (in Idylwild) plus the local churches and various Home/ Property Owners Associations could be very helpful in advising and assisting this population as needed in evacuation or "sheltering in place". Any type of education to the public regarding awareness of the fire threat and their own responsibility is certainly valuable for the upcoming fire season.. the Idyllwild Town Crier is certainly to be commended for their coverage, however I have discovered that not all residents, or off-Hill owners buy or subscribe to this local weekly newspaper.

Thank you for reviewing these comments.

Sincerely,

Mary Ann E. Miller
P.O. Box 3566
Idyllwild CA 95459
(951) 659-0164
maem@greencafe.com

# California Regional Water Quality Control Board
## Santa Ana Region

**Alan C. Lloyd, Ph.D.**
*Agency Secretary*

3737 Main Street, Suite 500, Riverside, California 92501-3348
Phone (951) 782-4130 • FAX (951) 781-6288 • TDD (951) 782-3221
www.waterboards.ca.gov/santaana

**Arnold Schwarzenegger**
*Governor*


February 10, 2006

Dave Kehrlein
dkehrlein@esri.com
ESRI, 380 New York St.
Redlands, CA 92373

**San Jacinto Mountains Community Wildfire Protection Plan – Draft**

Dear Mr. Kehrlein,

We have reviewed the above-mentioned document via Jim Russell, Partnership Coordinator at the San Bernardino National Forest, San Jacinto Ranger District. We have the following comments.

In section 7, the document discussed the values at risk should wildfires occur on the San Jacinto Mountains. Section 7.2.1 stated that "Lake Hemet and other reservoirs and streams are at risk from sediment after a fire". We would like to add that nitrogen loads would also increase after a fire, and the lakes and reservoirs and the streams may experience eutrophication (algal blooms, fish kills), due to extra nitrogen loads.

Section 7.3 discussed the risk for Santa Ana watershed. The document only mentioned the risk to recharge basins and a water line. There should also be a discussion on the risk of fires to the natural groundwater recharge capability in the upper San Jacinto Upper Pressure Zone.

In section 11, environmental concerns about the fire-fighting projects, we suggest that a discussion of the impacts of the projects on the beneficial uses of the San Jacinto River reaches, and the downstream Canyon Lake and Lake Elsinore. Beneficial uses for these waterbodies are contained in our Water Quality Control Plan (Basin Plan) which may be downloaded from the Board's website: http://www.waterboards.ca.gov/santaana.

We also want to mention that Canyon Lake and Lake Elsinore, two waterbodies at the terminus of the San Jacinto River watershed are listed on the federal Clean Water Act Section 303 (d) list of impaired waters for excessive nutrients (nitrogen and phosphorus). The Regional Board has adopted regulations (known as Total Maximum Daily Loads (TMDLs)) to control nitrogen and phosphorus runoff from all sources, including the forested lands. We would like a discussion about the projects and their effects on the nitrogen and phosphorus loads from the project areas.

Thank you for providing us the opportunity to review the Wildfire Protection Plan. Please contact me at (951) 782-4493, hsmythe@waterboards.ca.gov or Cindy Li at (951) 782-4906, cli@waterboards.ca.gov, if you have any questions about our comments.

Sincerely,

***/via e-mail/***

Hope Smythe
Chief, Inland Water Planning

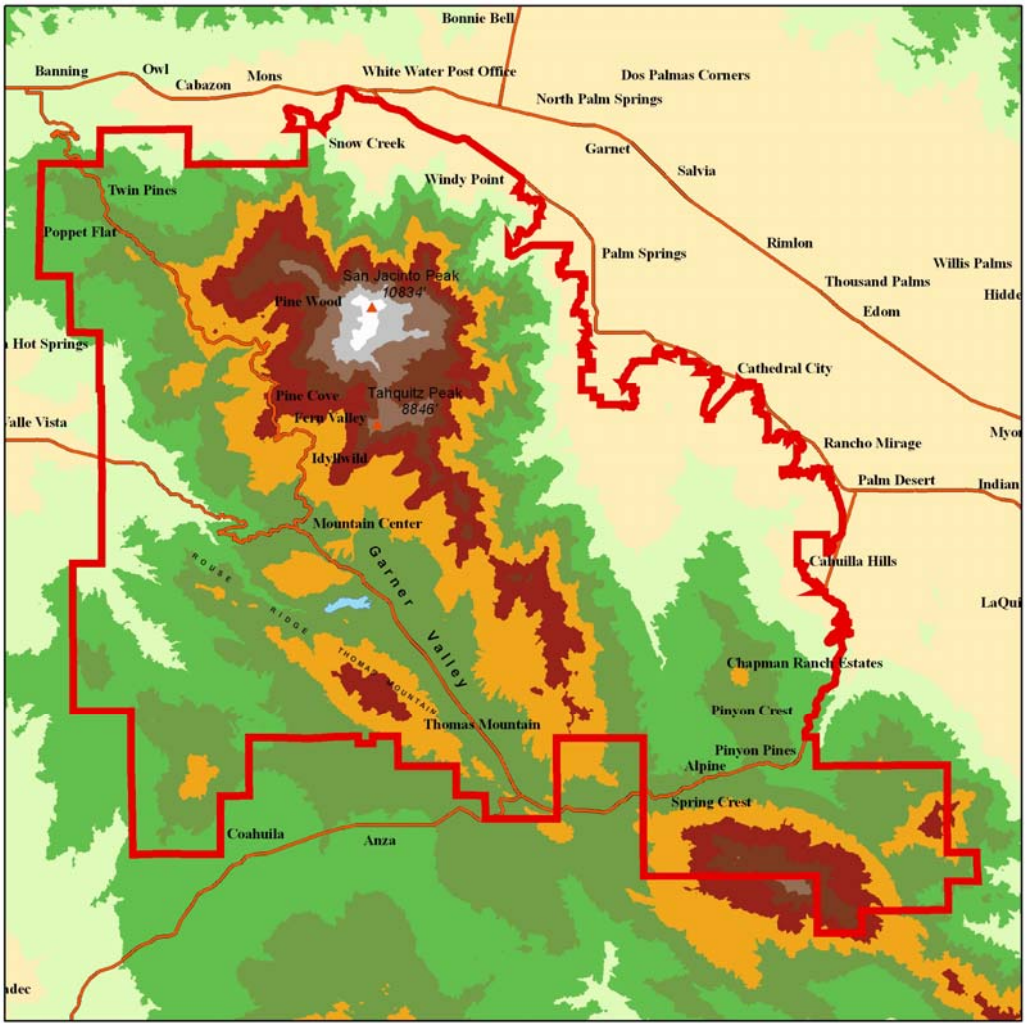
# Appendix E

## Maps

Map - 1

Map - 2

# San Jacinto Mountain CWPP - Elevation




WUI Boundary
Mountain Peaks
Highways
Lake

Elevation (feet)
0 - 2,000
2,000 - 3,000
3,000 - 4,000
4,000 - 5,000
5,000 - 6,000
6,000 - 7,000
7,000 - 8,000
8,000 - 9,000
9,000 - 10,000
10,000 - 10,834

N

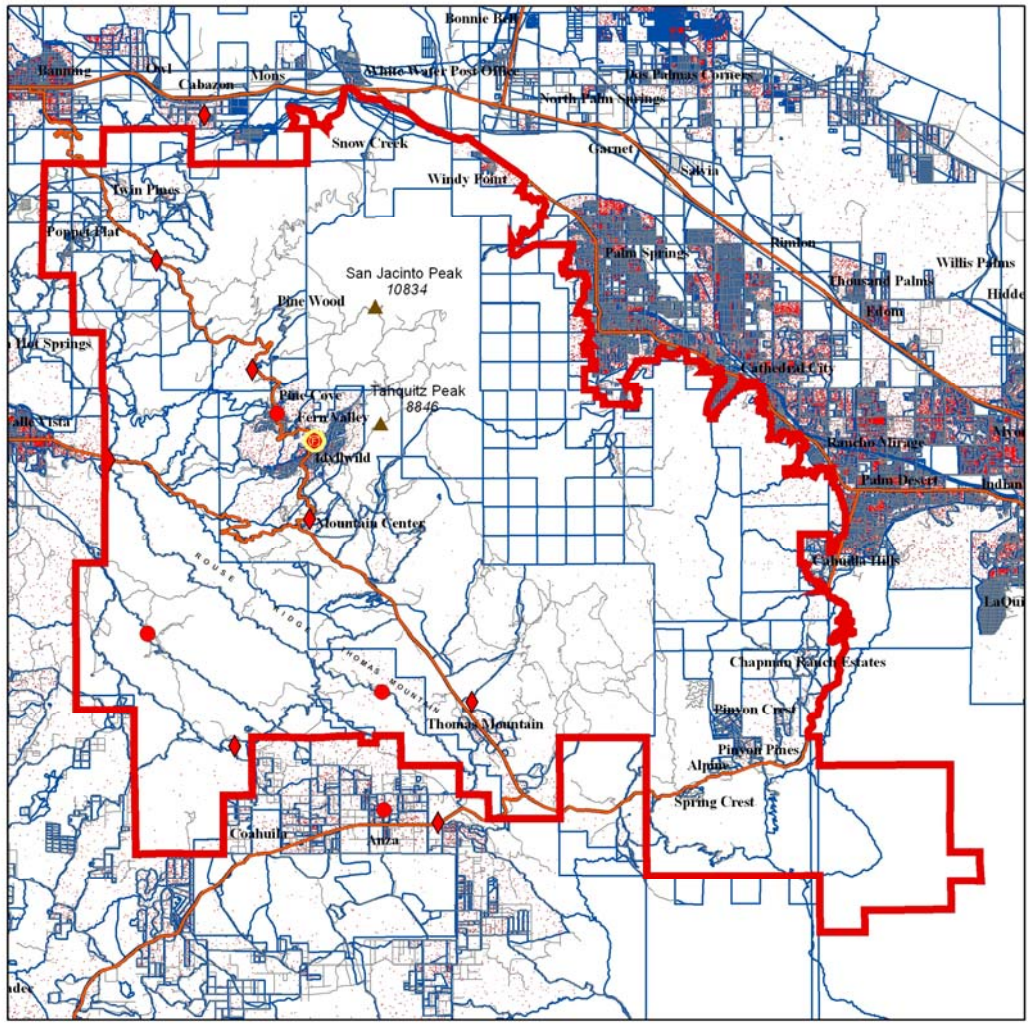
MAST
Mountain Area Safety Taskforce

0 1.5 3 6 9 12 Miles

A Healthy Forest is a Healthy Habitat
Mountain Communities FireSafe Council

Map – 3

# San Jacinto Mountain CWPP - Census Block Population




WUI Boundary
Idyllwild Fire Station
CDF Facilities
BDF Stations
Mountain Peaks
Highways
Roads
1 Dot = 1
POPULATION

N

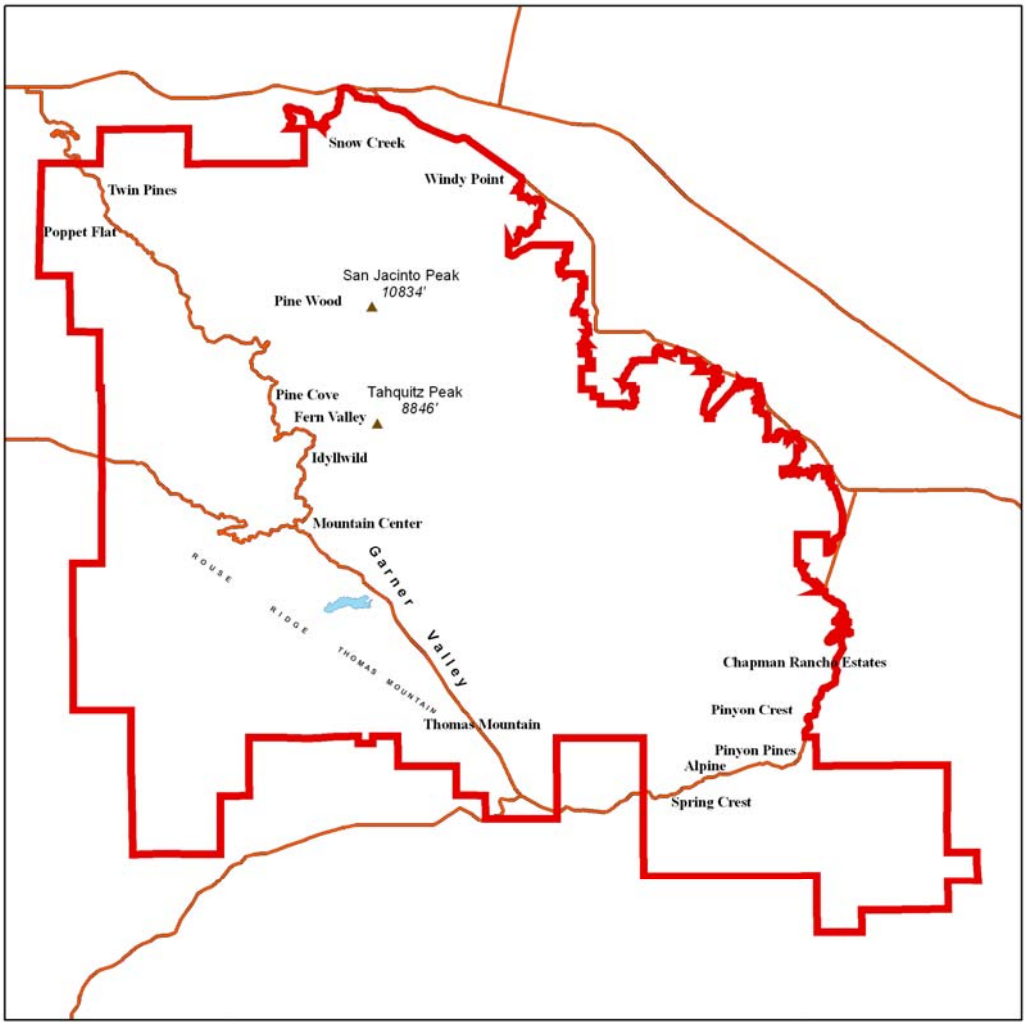
MAST
Mountain Area Safety Taskforce

0 1.5 3 6 9 12 Miles

A Healthy Forest is a Healthy Habitat
MOUNTAIN COMMUNITIES FireSafe COUNCIL

Map -
4

# San Jacinto Mountain CWPP - Communities




WUI Boundary
Mountain Peaks
Highways
Lake

N

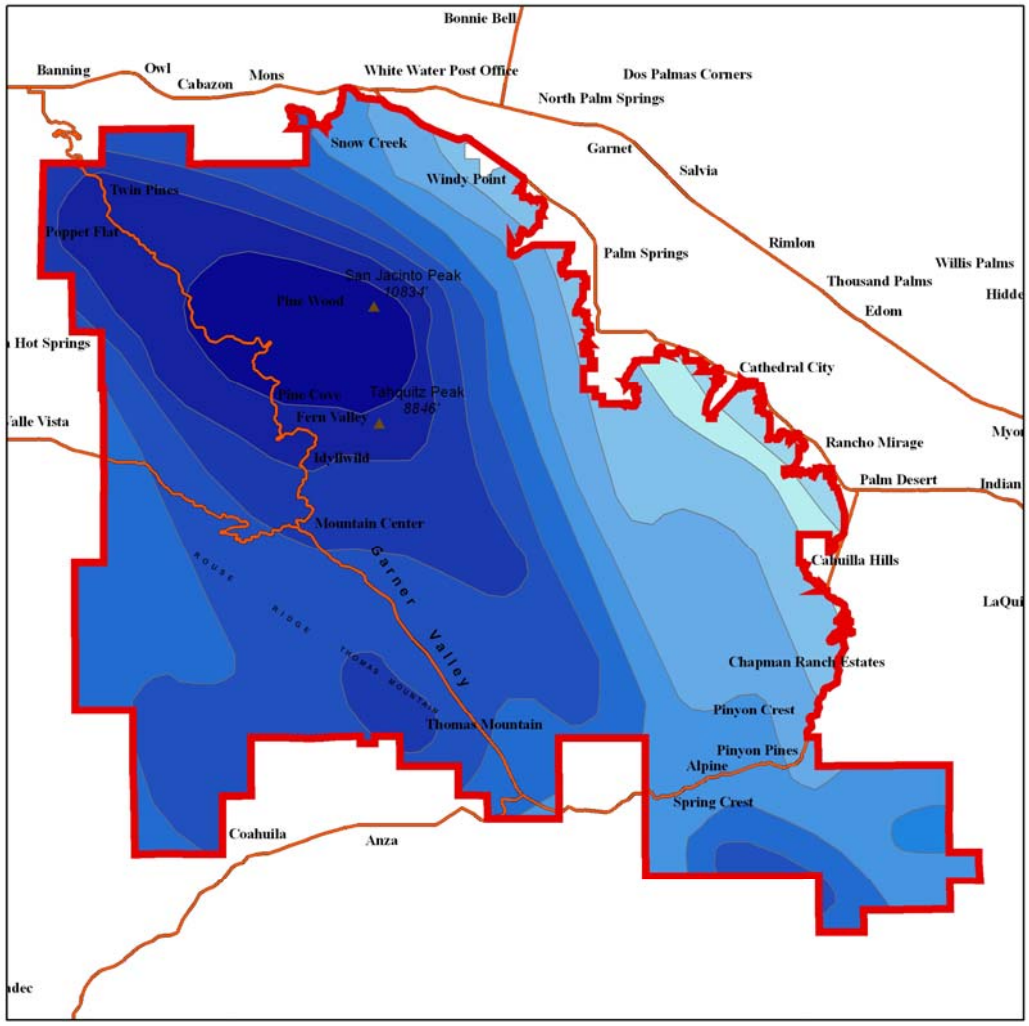
MAST
Mountain Area Safety Taskforce

0 1.25 2.5 5 7.5 10
Miles

A Healthy Forest is a Healthy Habitat
MOUNTAIN COMMUNITIES FireSafe COUNCIL

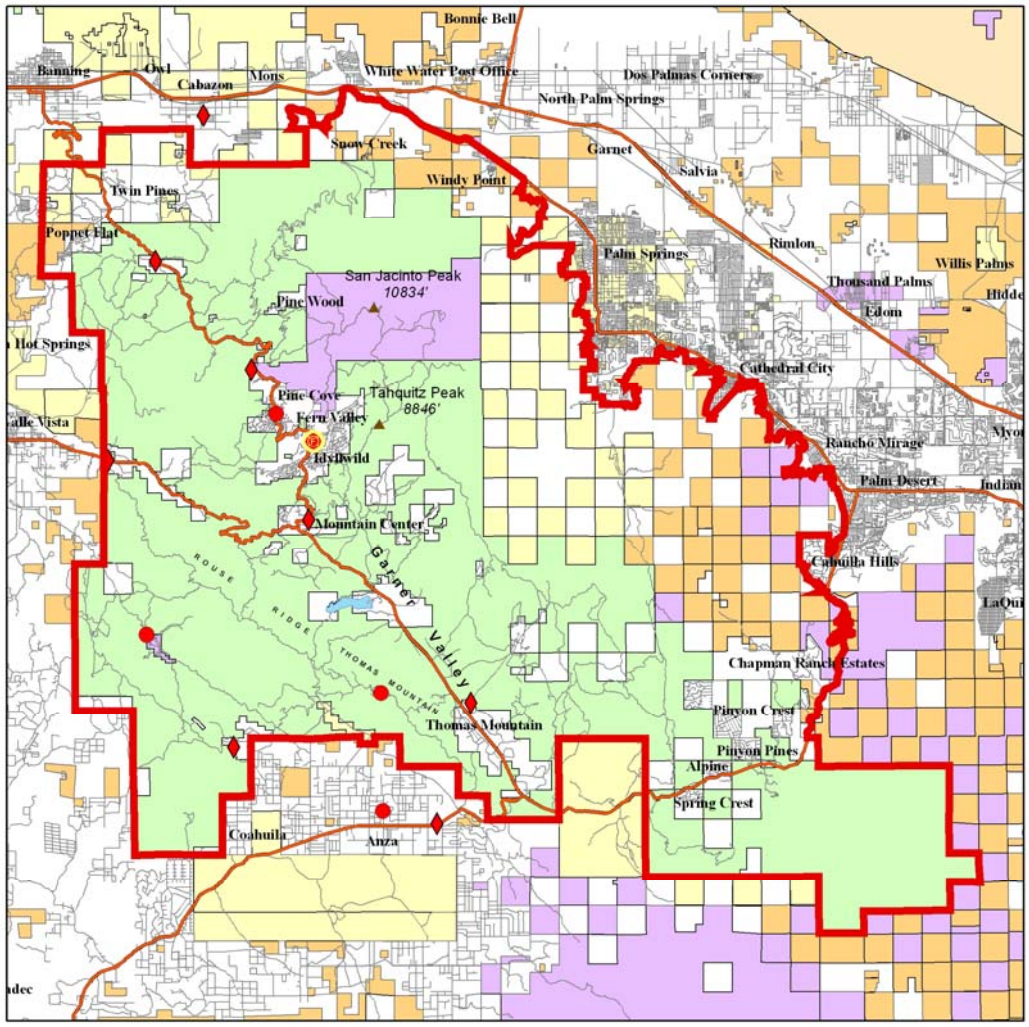
Map – 5

# San Jacinto Mountain CWPP - Precipitation



Map - 6

# San Jacinto Mountain CWPP - Wildland Urban Interface




WUI Boundary
Idyllwild Fire Station
CDF Facilities
BDF Stations
Mountain Peaks
Highways
Roads
Lake
FEDERAL LAND
FOREST LAND
NATIONAL PARK
STATE LAND
INDIAN RESERVATION
PRIVATE LAND

N

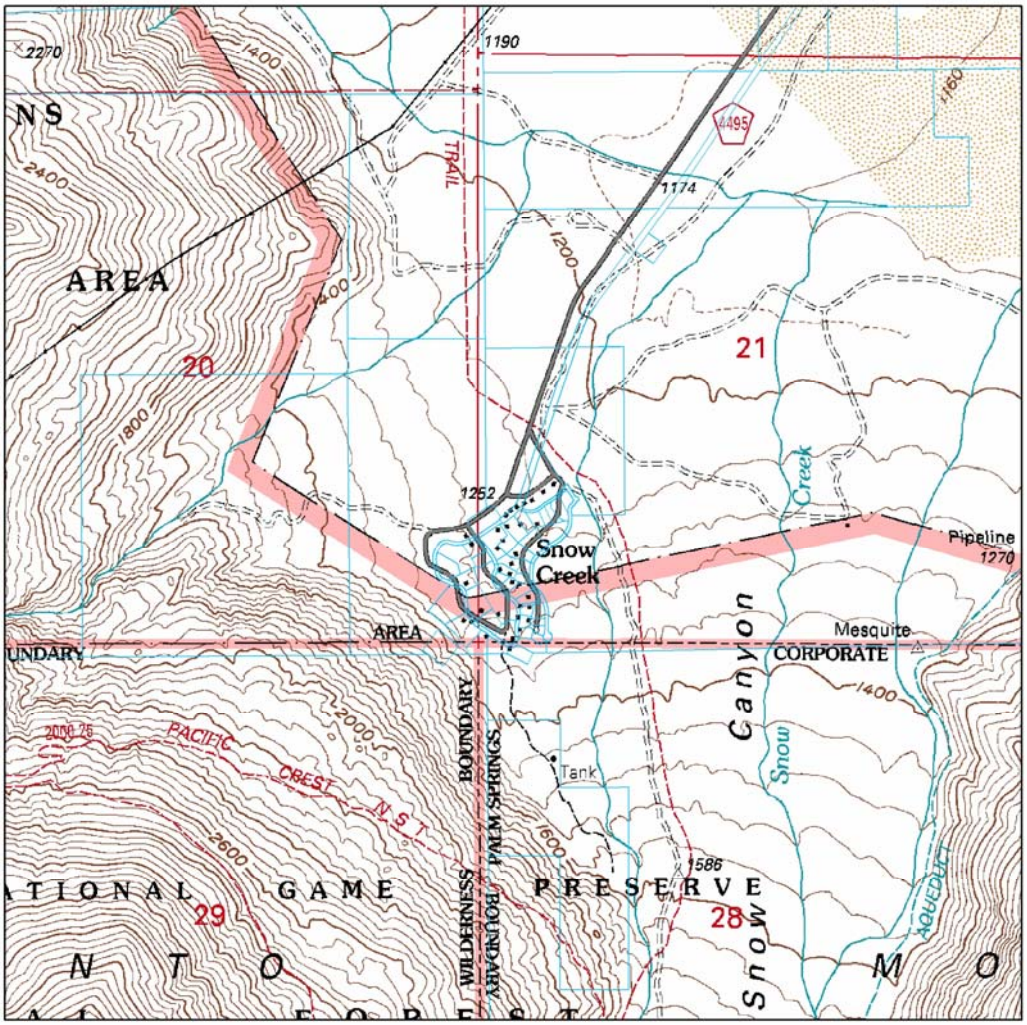
MAST
Mountain Area Safety Taskforce

0 1.5 3 6 9 12 Miles

A Healthy Forest is a Healthy Habitat
MOUNTAIN COMMUNITIES FireSafe COUNCIL

Map – 8

# San Jacinto Mountain CWWP - Snow Creek - TOPO




WUI Boundary
CDF Facilities
BDF Stations
Local Fire Stations
Mountain Peaks
Lake
Parcels

N

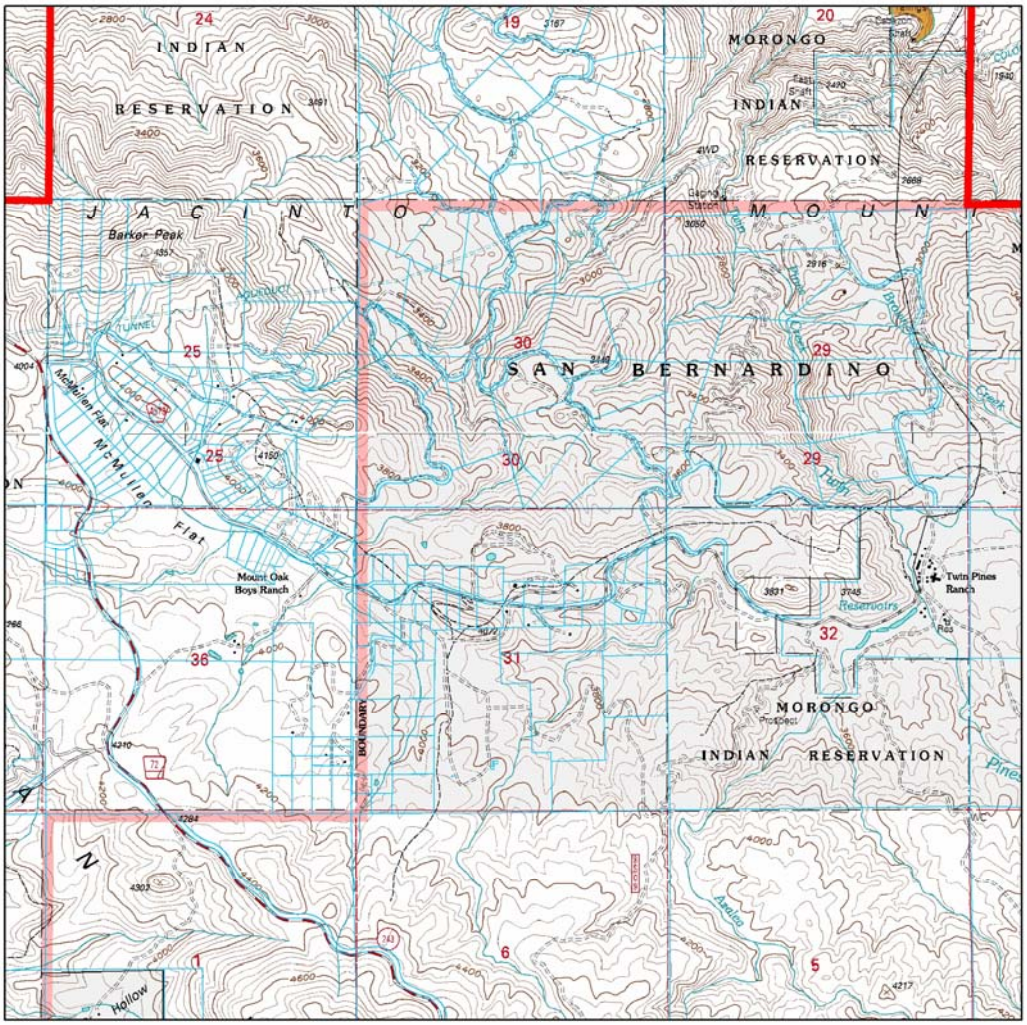
MAST
Mountain Area Safety Taskforce

0 0.05 0.1 0.2 0.3 0.4 Miles

A Healthy Forest is a Healthy Habitat
MOUNTAIN COMMUNITIES FireSafe COUNCIL

Map – 9

# San Jacinto Mountain CWPP - Twin Pines - TOPO




WUI Boundary
CDF Facilities
BDF Stations
Local Fire StationS
Mountain Peaks
Lake
Parcels

N

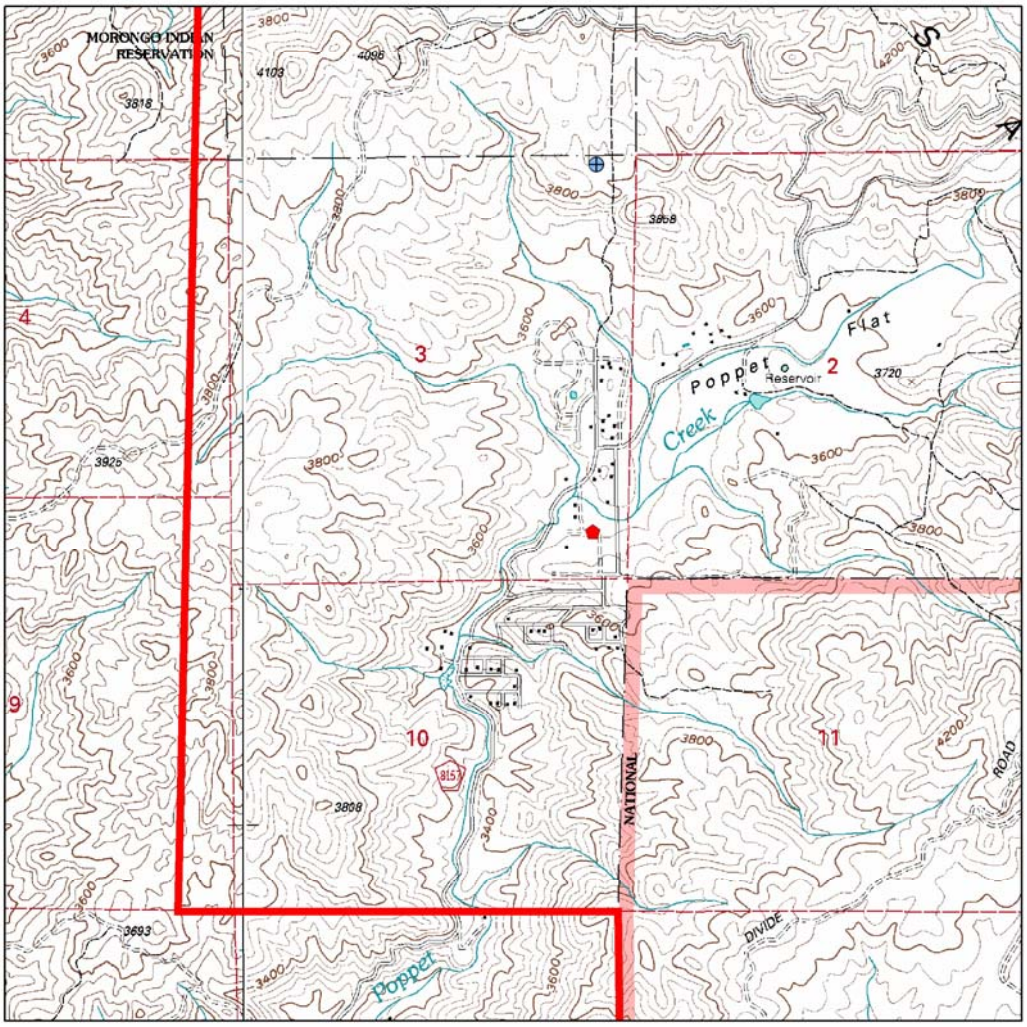
MAST
Mountain Area Safety Taskforce

0 0.125 0.25 0.5 0.75 1 Miles

A Healthy Forest is a Healthy Habitat
MOUNTAIN COMMUNITIES FireSafe COUNCIL

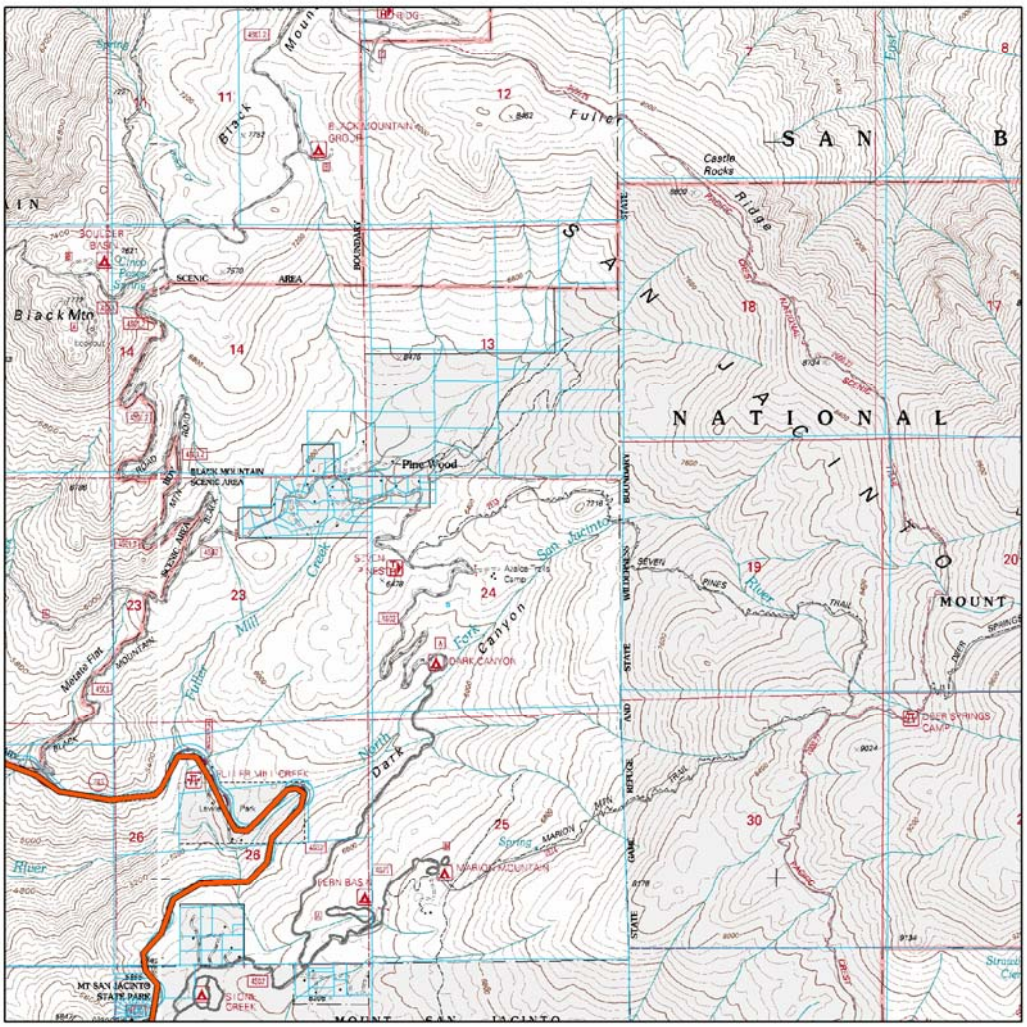
Map – 10

# San Jacinto Mountain CWPP - Poppet Flat - TOPO



Map – 11

# San Jacinto Mountain CWPP - Pine Wood - TOPO




WUI Boundary
CDF Facilities
BDF Stations
Local Fire Stations
Mountain Peaks
Highways
Roads
Lake
Parcels

N

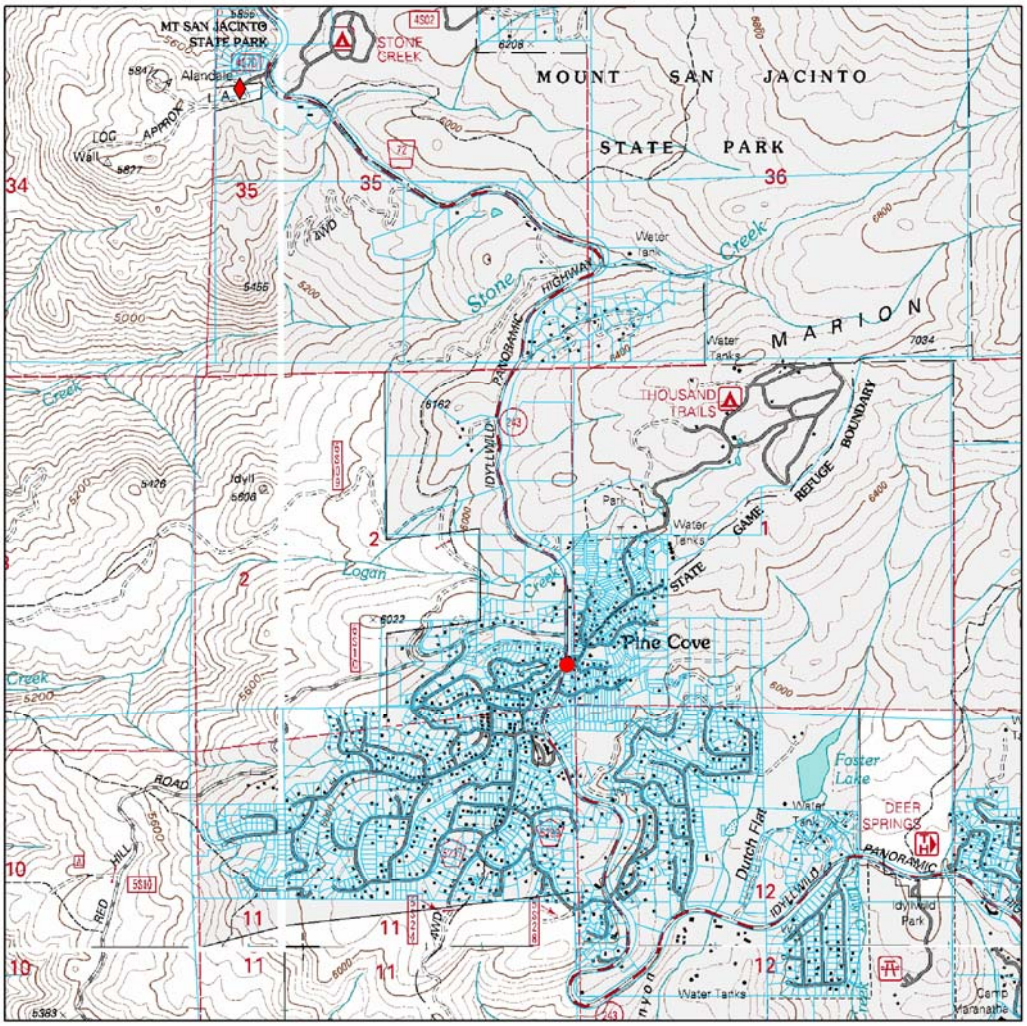
MAST
Mountain Area Safety Taskforce

0 0.15 0.3 0.6 0.9 1.2 Miles

A Healthy Forest is a Healthy Habitat
MOUNTAIN COMMUNITIES FireSafe COUNCIL

Map – 12

# San Jacinto Mountain CWPP - Pine Cove - TOPO




WUI Boundary
Idyllwild
CDF Facilities
BDF Stations
Local Fire Stations
Mountain Peaks
Lake
Parcels

N

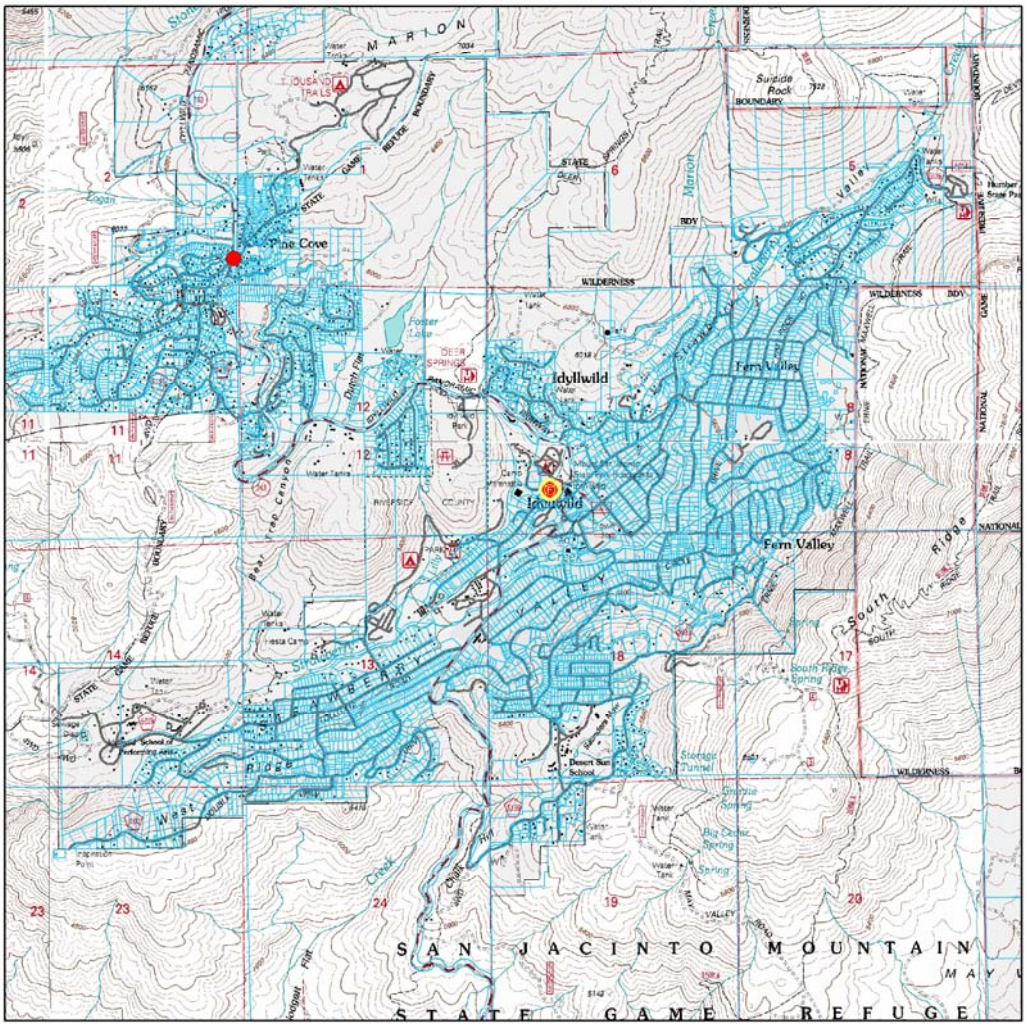
MAST
Mountain Area Safety Taskforce

0 0.125 0.25 0.5 0.75 1 Miles

A Healthy Forest is a Healthy Habitat
Mountain Communities Fire Safe Council

Map – 13

# San Jacinto Mountain CWPP - Idyllwild - TOPO




WUI Boundary
Idyllwild Fire Station
CDF Facilities
BDF Stations
Local Fire Stations
Mountain Peaks
Highways
Roads
Lake
Parcels

N

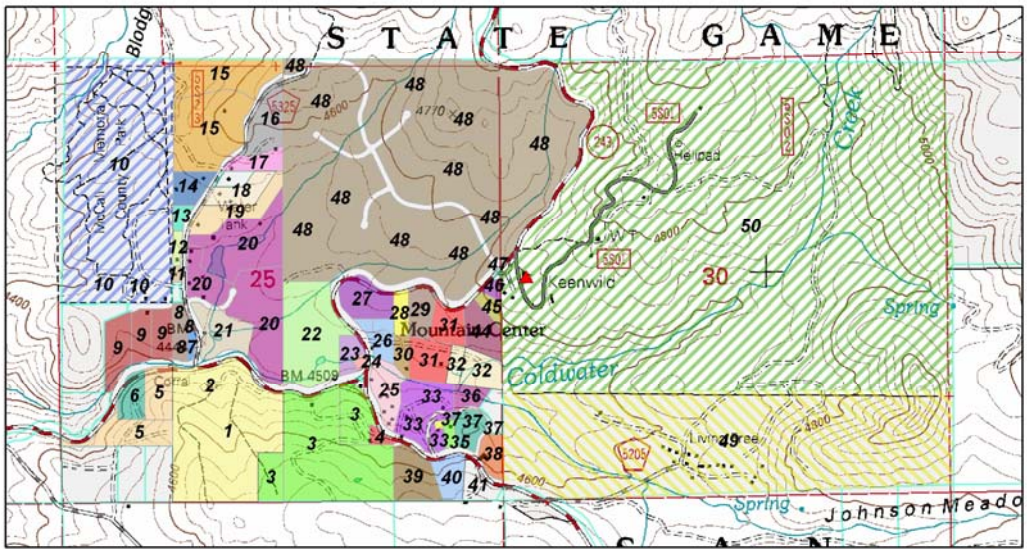
MAST
Mountain Area Safety Taskforce

0 0.15 0.3 0.6 0.9 1.2 Miles

A Healthy Forest is a Healthy Habitat
Mountain Communities FireSafe Council

Map – 14

# San Jacinto Mountain CWPP - Mountain Center - TOPO




CDF Facilities
BDF Stations
Local Fire Stations
Lake
Parcel_Info
<all other values>
Mnt. Center Remarks
1. No water, no tank, low capacity well
2. Anza Electric Substation
3. HK Smith; Well on property
4. low capacity well
5. Three (3) wells (good), no storage
6 Well on property
7 Edison Substation
8. Well on property
9. Selby, Two (2) storage tanks
10. McCall Park, storage tank
11. well, no storage
12. Three (3) 4500 gal tanks
13. Well no storage
14. Well with water storage
15. Well, two (2) storage tanks 3500 metal
16. J.W. low capacity well; 5000 gal storage
17. well and storage tank of 3500 gallons
18. T. Pays, three (3) wells with 5000 gallon storage
19. Valerie, no water
20. Nelson; 80000 gal storage tank; three (3) ponds
21. Hadden, well, so storage, seasonal pond
22. Morning Sky School, 60000 gallons storage
23. no water
24. Stewart, well, no storage
25. Walt Schmidt, well, no sotrage
26. Lou & Robin, well, no storage
27. Esparza, well, 5000 gal storage
28. Lombard, wells, 5000 and 2400 gal storage
29. Telles, well, no storage
30. well, no storage
31. Cecil Peters, 2 wells, storage 4 to 5000 gal
32. B. Finch, small pond
33. Bischof, two wells, 5000 gal storage
34. no water
35. no water
36. no water
37. Two (2) wells, one working, no storage
38. unknown
39. H. Hale, no electric, little water
40. vacant
41. Ol Pearson place, good well
44. Dory, well, horizontal storage
45. vacant
46. Ferrellgas (propane storage and distribution)
48. Tarek Shawaf
49. 'Living Free' Animal Sanctuary
50. Keenwild USFS Station, with helicopter pad

N

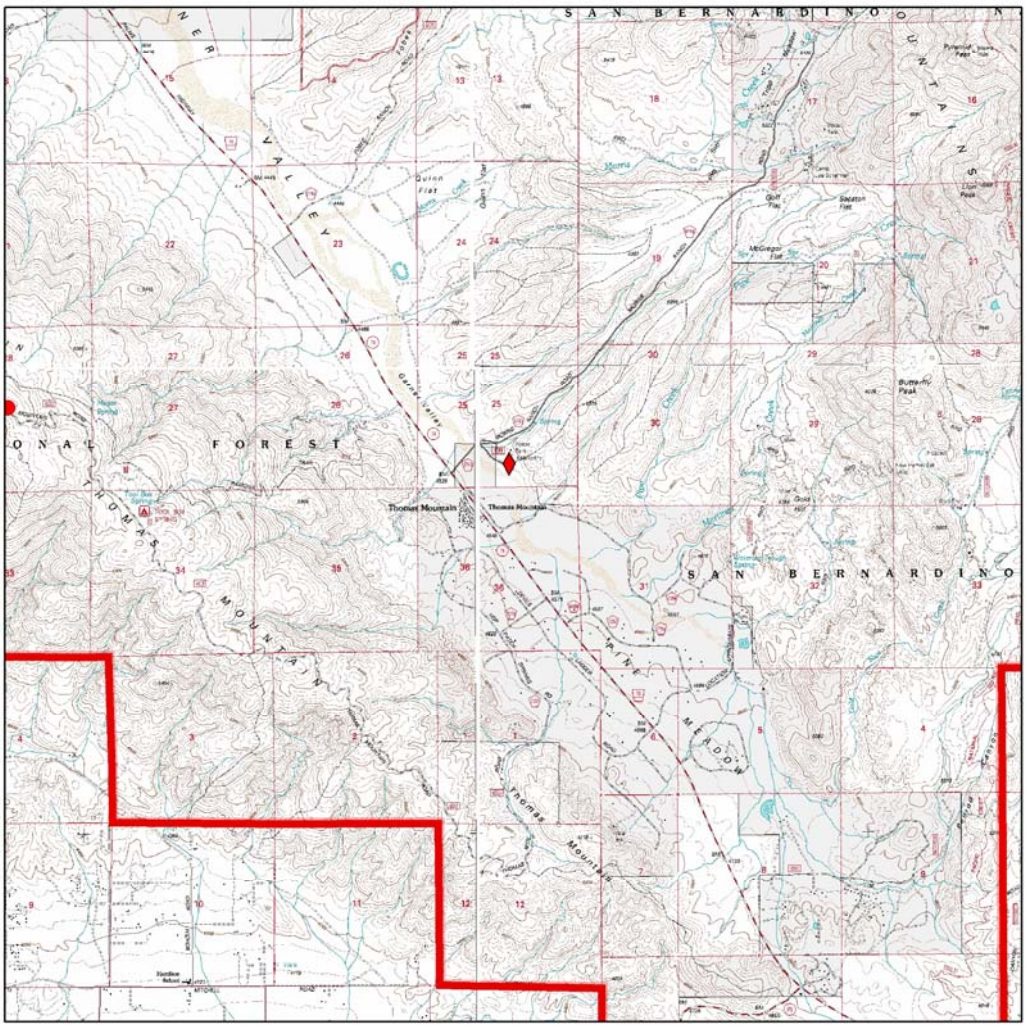
MAST
Mountain Area Safety Taskforce

0 0.1 0.2 0.4 0.6 0.8 Miles

A Healthy Forest is a Healthy Habitat
MOUNTAIN COMMUNITIES FireSafe COUNCIL

Map - 15

# San Jacinto Mountain CWPP - Garner Valley - TOPO




WUI Boundary
CDF Facilities
BDF Stations
Mountain Peaks
Lake

N

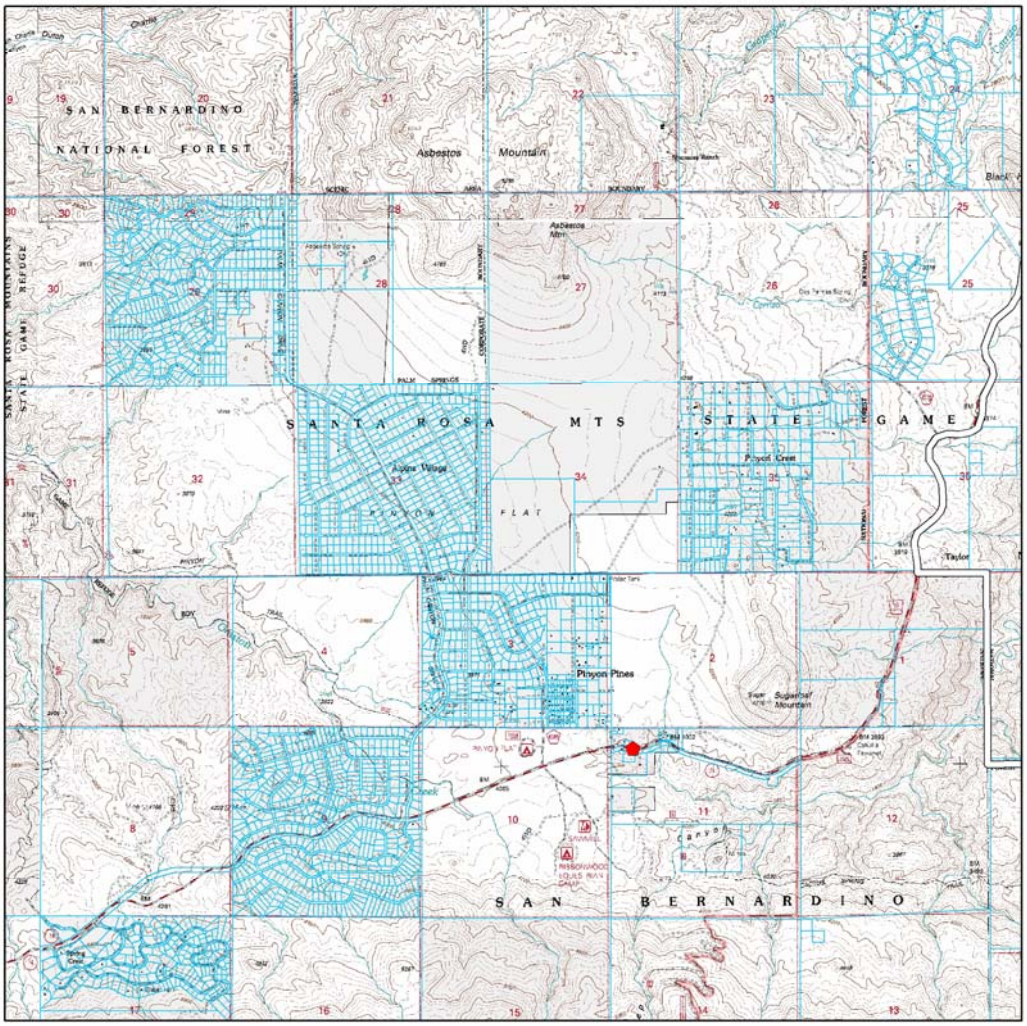
MAST
Mountain Area Safety Taskforce

0 0.25 0.5 1 1.5 2 Miles

A Healthy Forest is a Healthy Habitat
MOUNTAIN COMMUNITIES FireSafe COUNCIL

Map – 16

# San Jacinto Mountain CWPP - Pinyon - TOPO




WUI Boundary
CDF Facilities
BDF Stations
Local Fire Stations
Mountain Peaks
Lake
Parcels

N

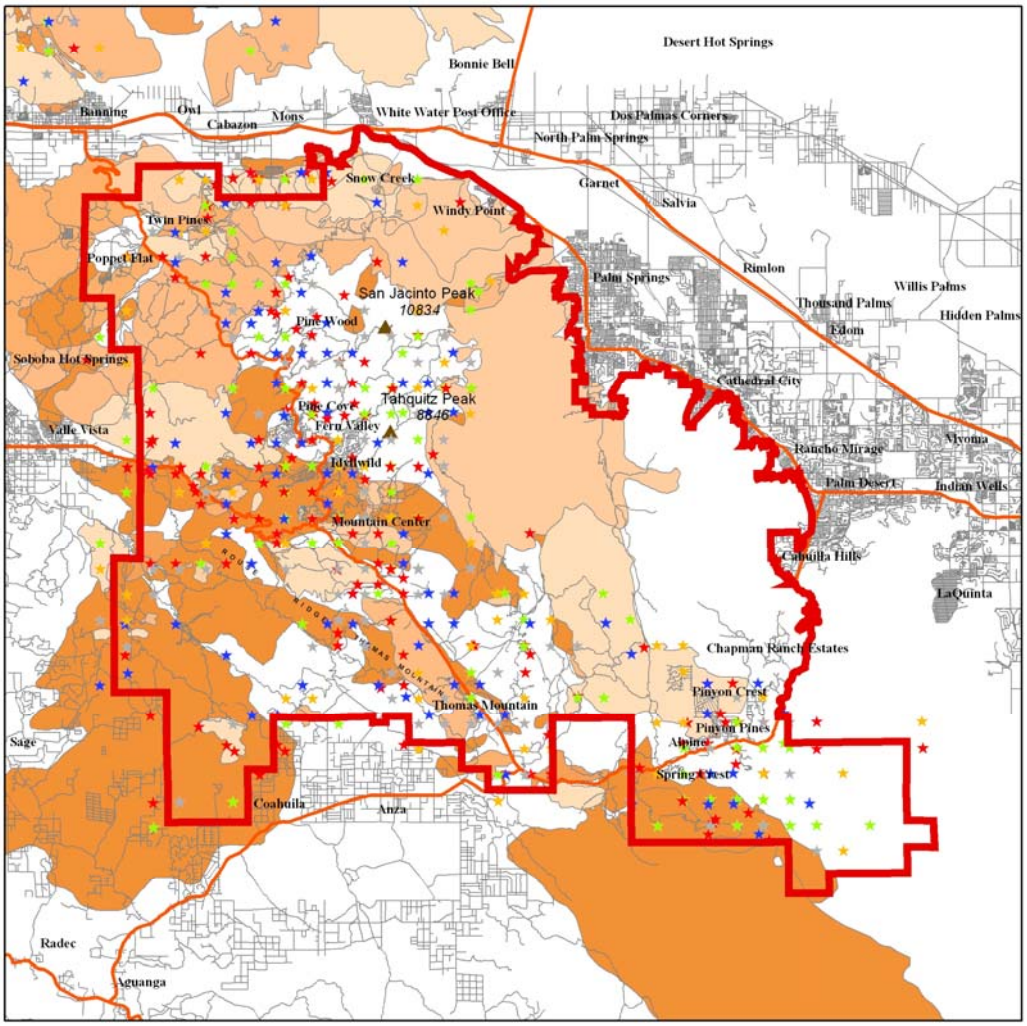
MAST
Mountain Area Safety Taskforce

0 0.25 0.5 1 1.5 2 Miles

A Healthy Forest is a Healthy Habitat
Mountain Communities Fire Safe Council

Map - 17

# San Jacinto Mountain CWPP - Fire History




WUI Boundary

Ignition Fire Points (Lightning)
- 1970 - 1975
- 1976 - 1980
- 1981 - 1986
- 1987 - 1991
- 1992 - 1996

Fire History Date
- 2000
- 1990 - 1999
- 1980 - 1989
- 1970 - 1979
- 1960 - 1969
- 1950 - 1959
- 1906 - 1949

N

Source: CDF/FRAP

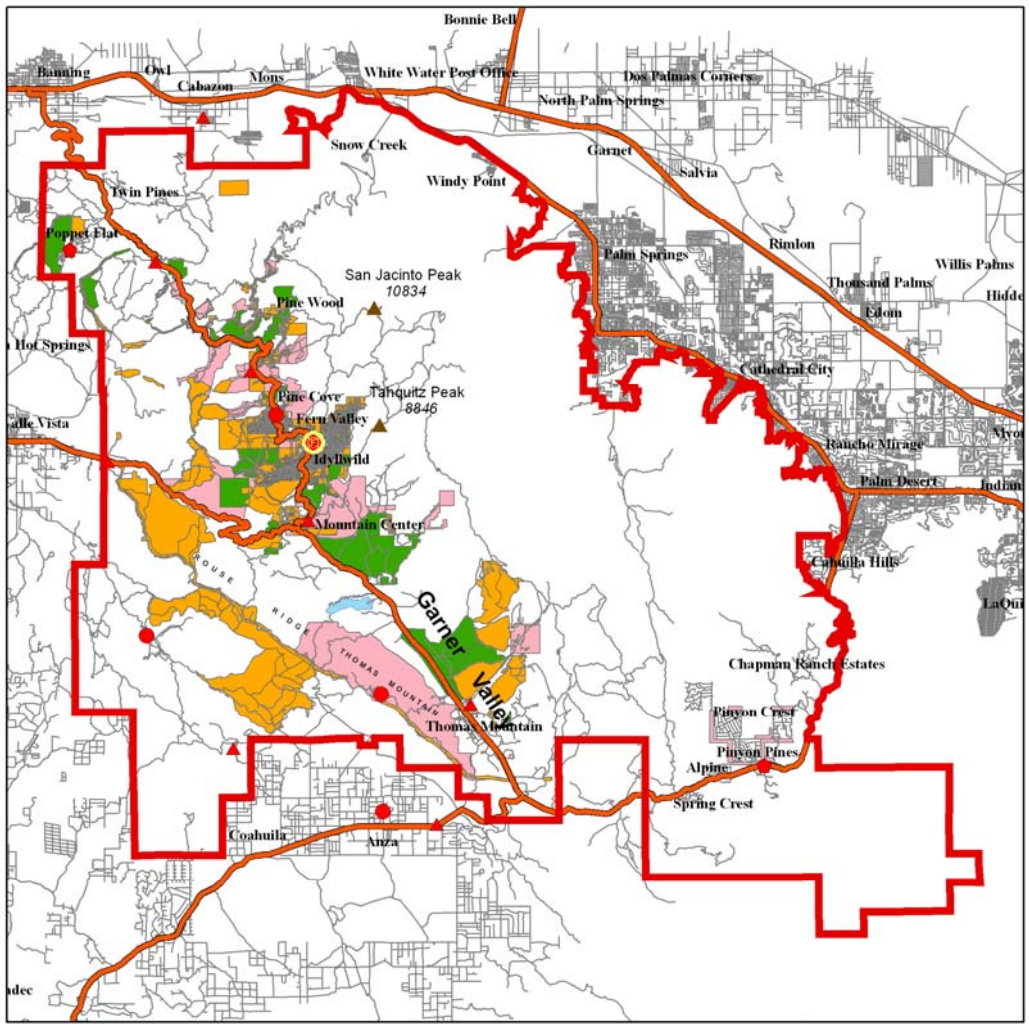
MAST
Mountain Area Safety Taskforce

0 1.5 3 6 9 12 Miles

A Healthy Forest is a Healthy Habitat
MOUNTAIN COMMUNITIES FireSafe COUNCIL

Map – 18

# San Jacinto Mountain CWPP - Fuel Reduction Treatments




WUI Boundary
Idyllwild Fire Station
CDF Facilities
BDF Stations
Local Fire Stations

Mountain Peaks
Highways
Roads
Lake

Treatments Status
Complete
In Progress
Planned

N

Source: CDF/FRAP

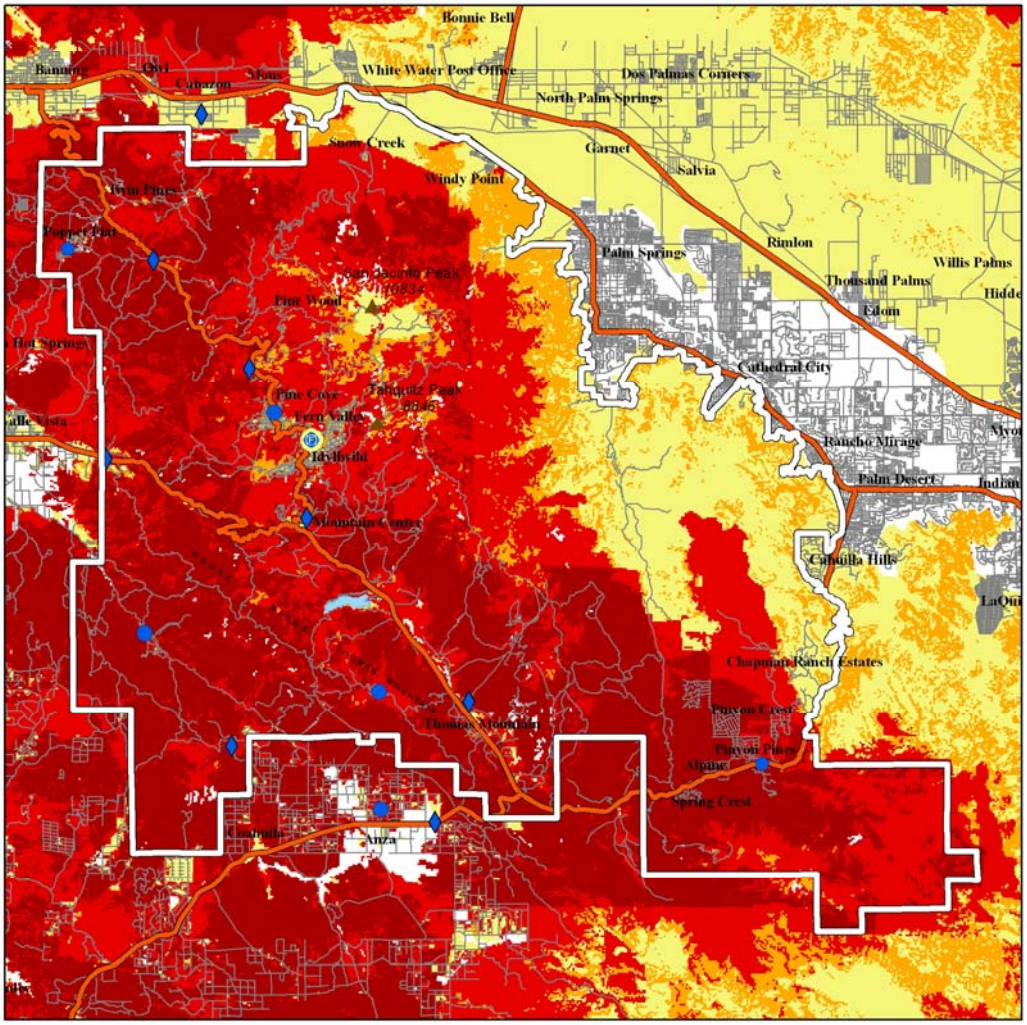
MAST
Mountain Area Safety Taskforce

0 1.25 2.5 5 7.5 10 Miles

A Healthy Forest is a Healthy Habitat
Mountain Communities FireSafe Council

Map – 19

# San Jacinto Mountain CWPP - Fire Threat




WUI Boundary
Idyllwild Fire Station
CDF Facilities
BDF Stations
Local Fire Stations
Mountain Peaks
Highways
Roads
Lake
Extreme
Very High
High
Moderate
Non Fuel

N

Source: CDF/FRAP

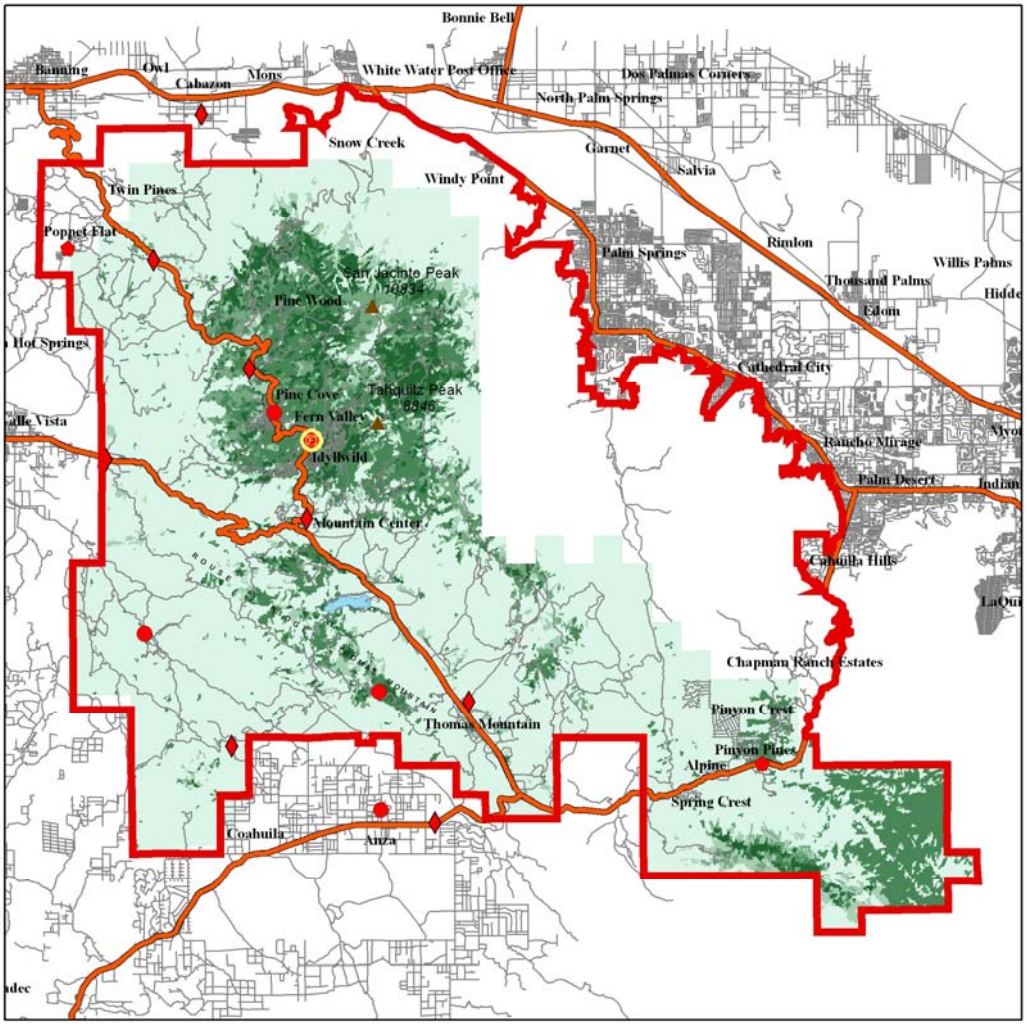
MAST
Mountain Area Safety Taskforce

0 1.5 3 6 9 12 Miles

A Healthy Forest is a Healthy Habitat
Mountain Communities FireSafe Council

Map - 20

# San Jacinto Mountain CWPP - Trees per Acre




WUI Boundary
Idyllwild Fire Station
CDF Facilities
BDF Stations
Local Fire Stations
Mountain Peaks
Highways
Roads
Lake
Tree per Acres
0 - 14
15 - 40
41 - 86
87 - 146
147 - 300

N

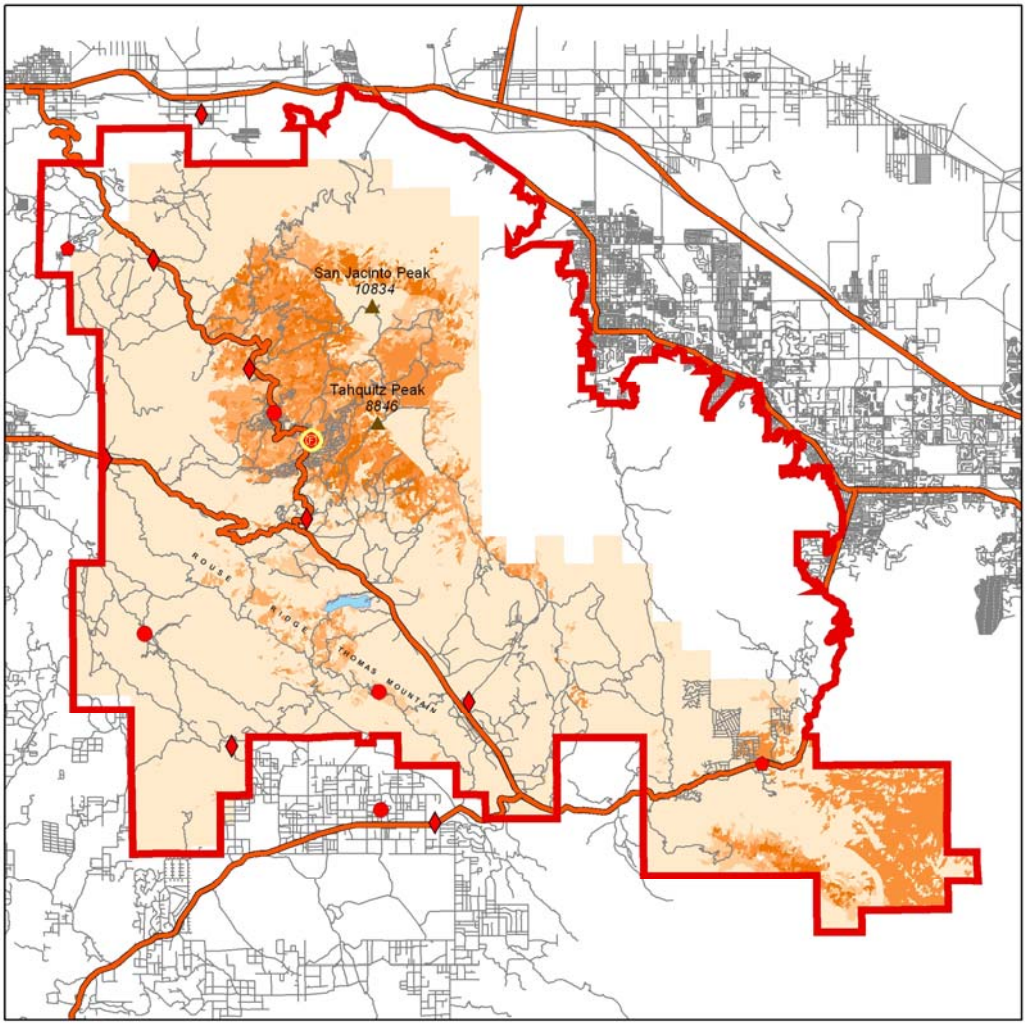
MAST
Mountain Area Safety Taskforce

0 1.5 3 6 9 12 Miles

A Healthy Forest is a Healthy Habitat
MOUNTAIN COMMUNITIES FireSafe COUNCIL

Map – 21

# San Jacinto Mountain CWPP - Tree Mortality per Acre




WUI Boundary
Idyllwild Fire Station
CDF Facilities
BDF Stations
Local Fire Stations
Mountain Peaks
Highways
Roads
Lake
Tree Mortality per Acres
0 - 10
10 - 32
32 - 58
58 - 96
96 - 151

N

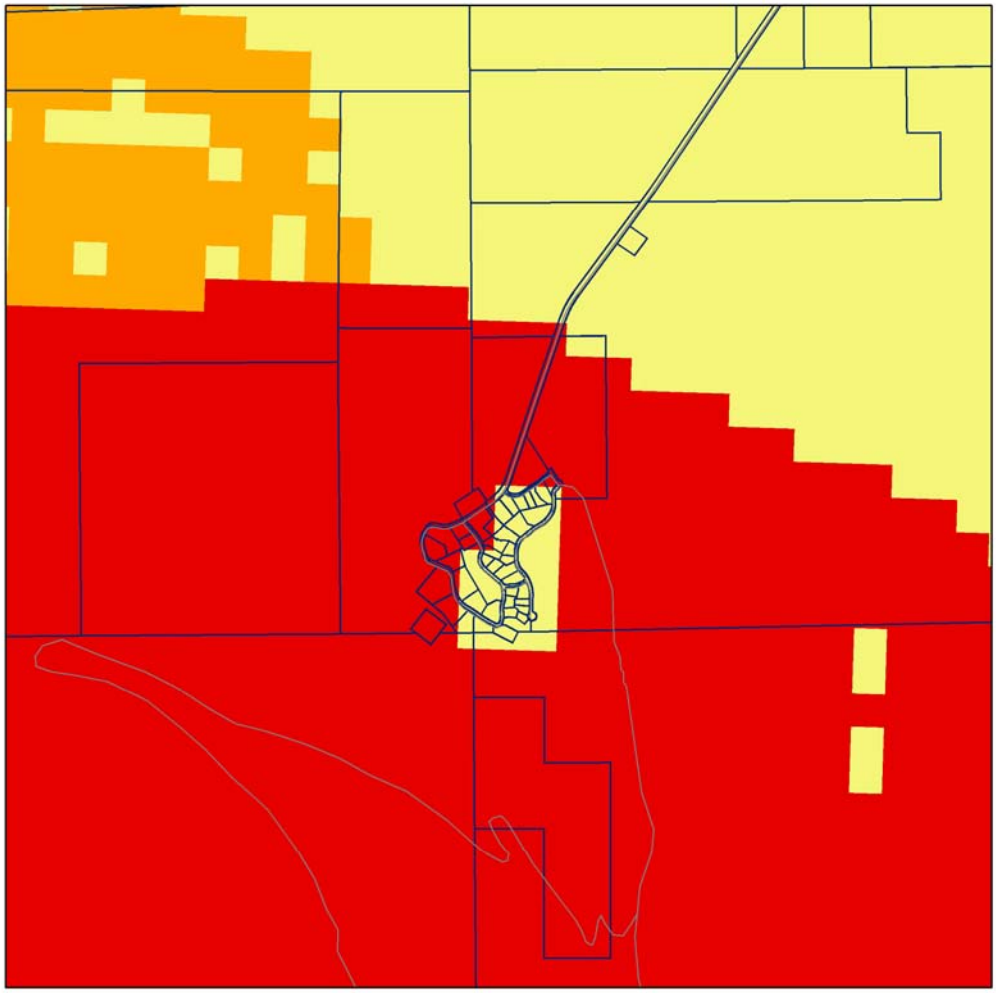
MAST
Mountain Area Safety Taskforce

0 1.5 3 6 9 12 Miles

A Healthy Forest is a Healthy Habitat
MOUNTAIN COMMUNITIES FireSafe COUNCIL

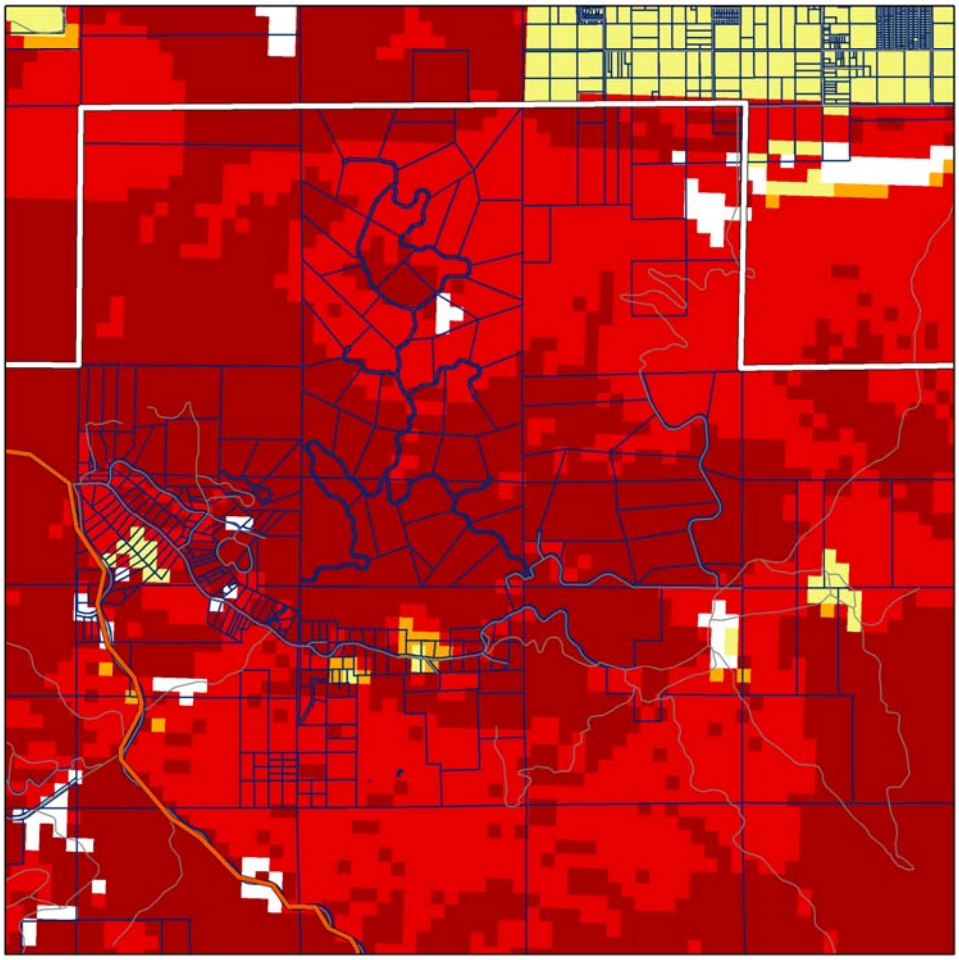
Map – 22

# San Jacinto Mountain CWPP - Snow Creek - Threat



Map – 23

# San Jacinto Mountain CWPP - Twin Pines - Fire Threat



WUI Boundary
CDF Facilities
BDF Stations
Local Fire StationS
Mountain Peaks
Highways
Roads
Lake
Parcels
Extreme
Very High
High
Moderate
Non Fuel

N

Source: CDF/FRAP
Status as of 2004

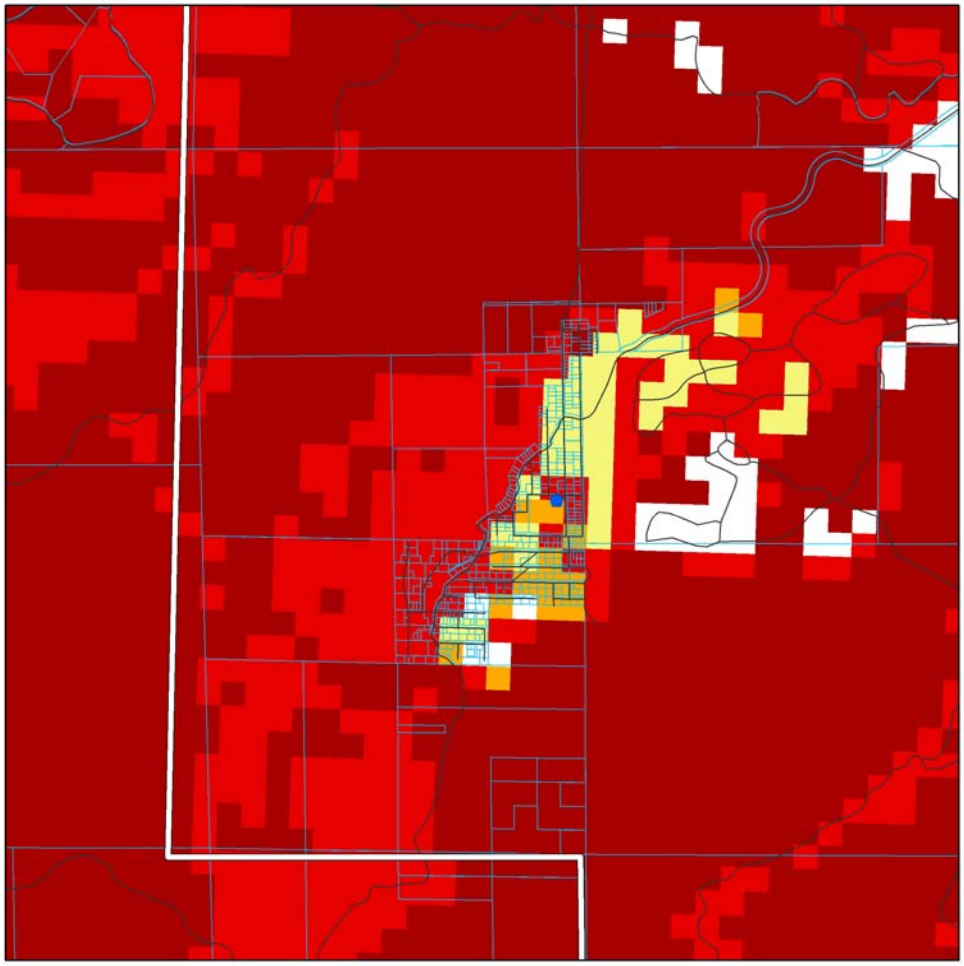
MAST
Mountain Area Safety Taskforce

0 0.15 0.3 0.6 0.9 1.2 Miles

A Healthy Forest is a Healthy Habitat
Mountain Communities Fire Safe Council

Map – 24

# San Jacinto Mountain CWPP - Poppet Flat - Fire Threat



WUI Boundary
CDF Facilities
BDF Stations
Local Fire Station
Mountain Peaks
Highways
Roads
Lake
Parcels
Extreme
Very High
High
Moderate
Non Fuel

N

Source: CDF/FRAP
Status as of 2004

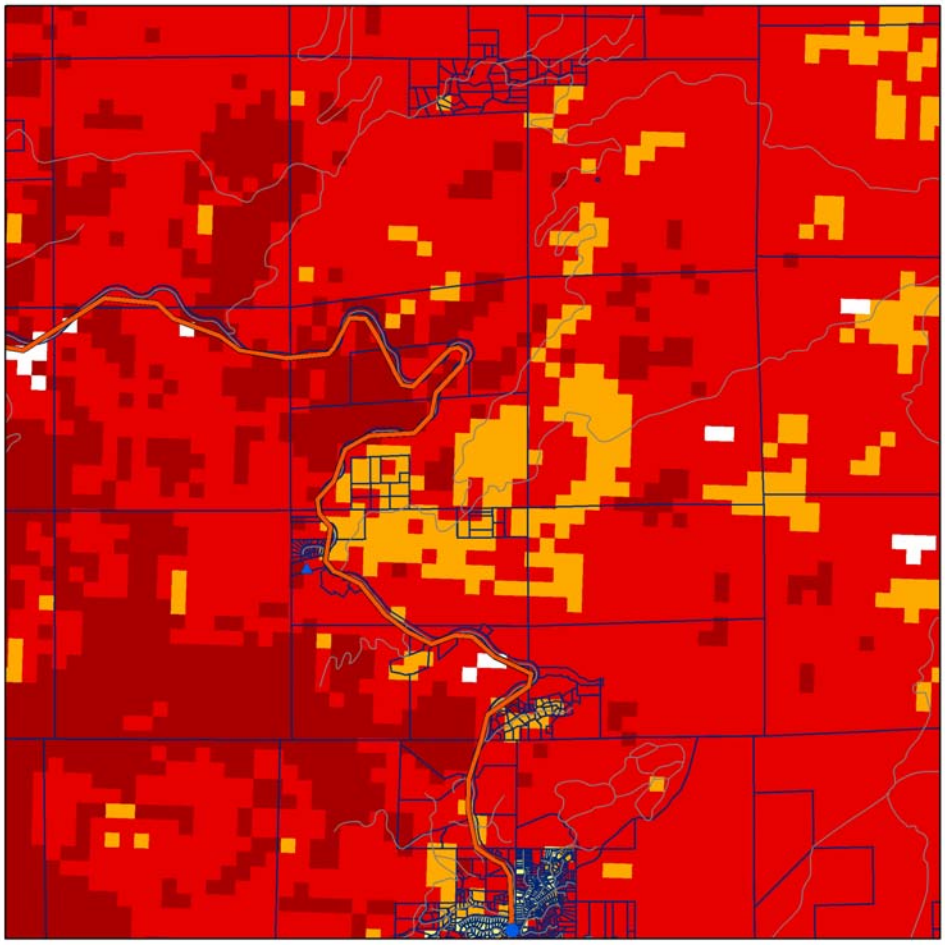
MAST
Mountain Area Safety Taskforce

0 0.1 0.2 0.4 0.6 0.8 Miles

A Healthy Forest is a Healthy Habitat
MOUNTAIN COMMUNITIES FireSafe COUNCIL

Map – 25

# San Jacinto Mountain CWPP - Pine Wood - Threat



WUI Boundary
CDF Facilities
BDF Stations
Local Fire Stations
Mountain Peaks
Highways
Roads
Lake
Parcels
Extreme
Very High
High
Moderate
Non Fuel

N

Source: CDF/FRAP
Status as of 2004

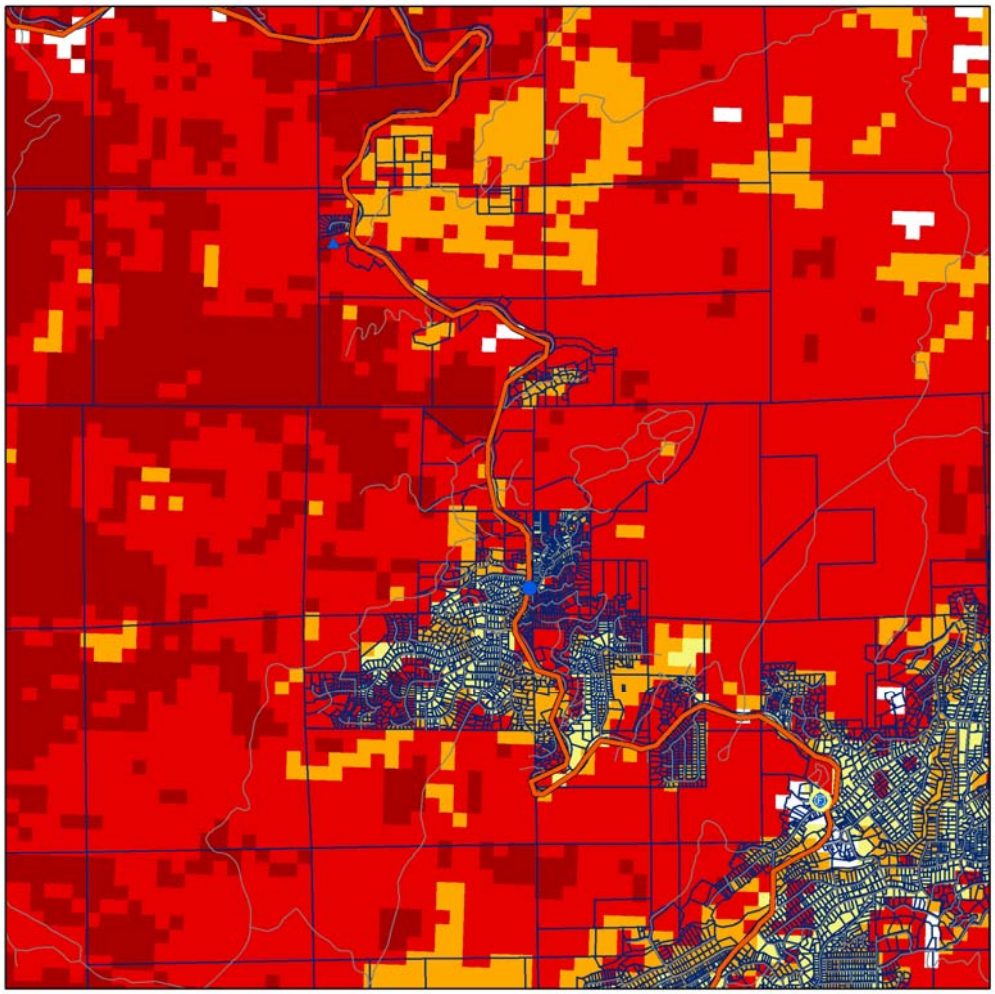
MAST
Mountain Area Safety Taskforce

0 0.15 0.3 0.6 0.9 1.2
Miles

A Healthy Forest is a Healthy Habitat
Mountain Communities Fire Safe Council

Map – 26

# San Jacinto Mountain CWPP - Pine Cove - Threat



WUI Boundary
Idyllwild Fire Station
CDF Facilities
BDF Stations
Local Fire Stations
Mountain Peaks
Highways
Roads
Lake
Parcels
Extreme
Very High
High
Moderate
Non Fuel

N

0 0.2 0.4 0.8 1.2 1.6 Miles

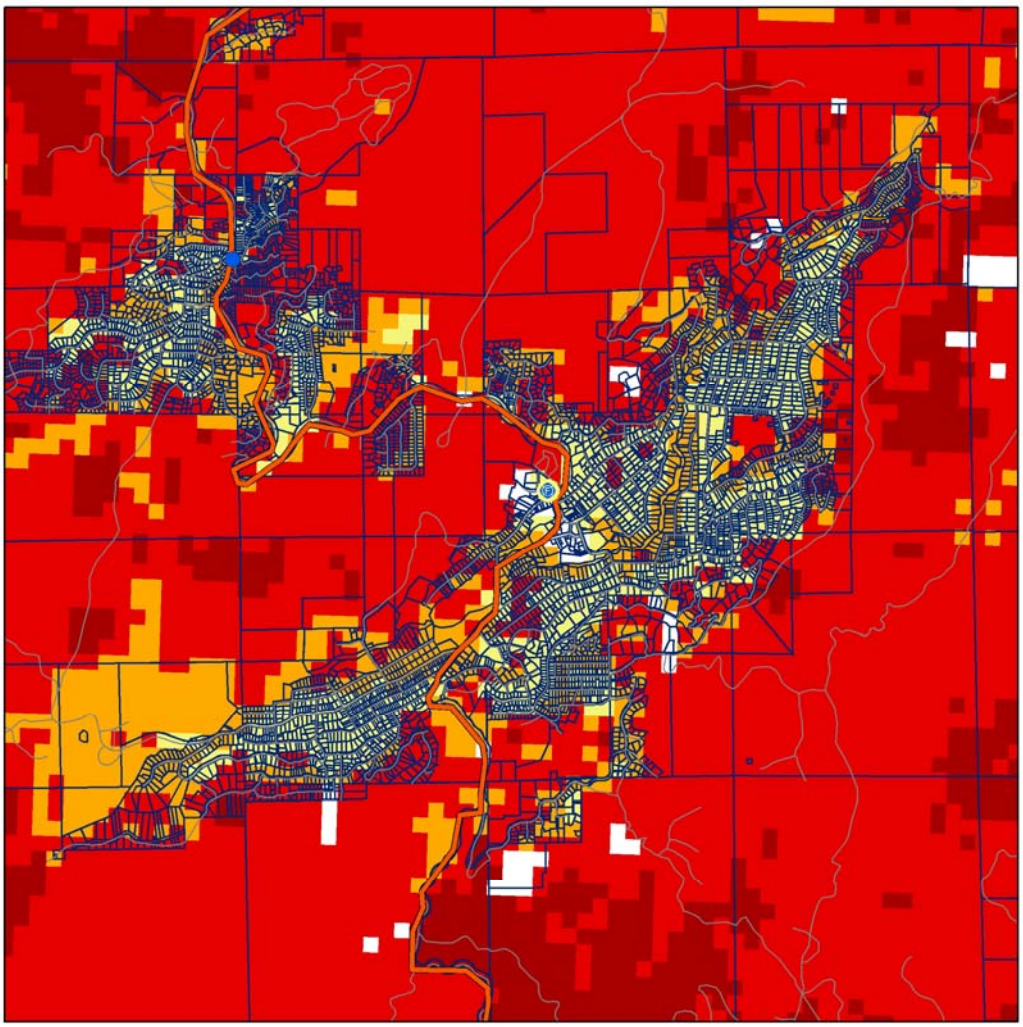
Source: CDF/FRAP
Status as of 2004

MAST
Mountain Area Safety Taskforce

A Healthy Forest is a Healthy Habitat
MOUNTAIN COMMUNITIES FIRESAFE COUNCIL

Map – 27

# San Jacinto Mountain CWPP - Idyllwild - Fire Threat



WUI Boundary
Idyllwild Fire Station
CDF Facilities
BDF Stations
Local Fire Stations
Mountain Peaks
Highways
Roads
Lake
Parcels
Extreme
Very High
High
Moderate
Non Fuel

N

Source: CDF/FRAP
Status as of 2004

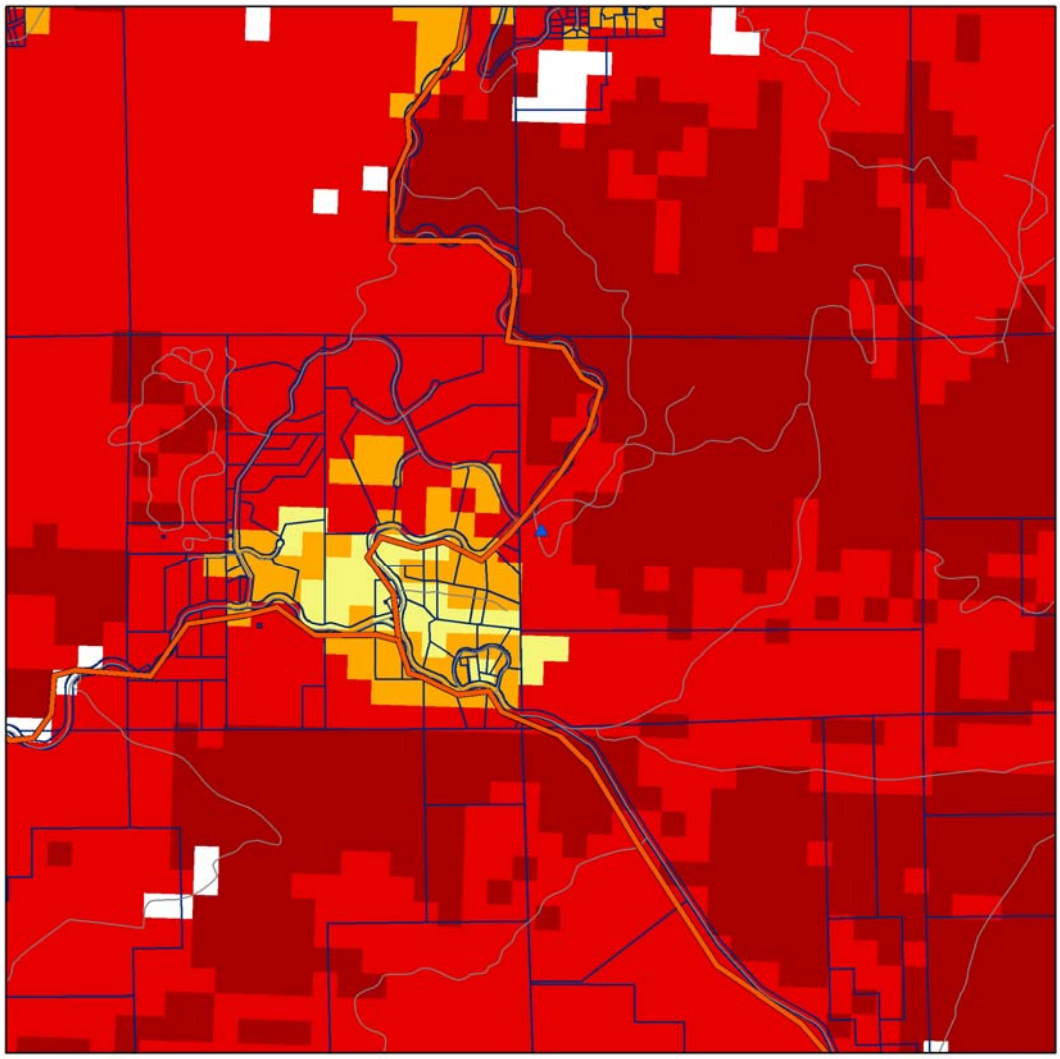
MAST
Mountain Area Safety Taskforce

0 0.15 0.3 0.6 0.9 1.2
Miles

A Healthy Forest is a Healthy Habitat
MOUNTAIN COMMUNITIES FireSafe COUNCIL

Map – 28

# San Jacinto Mountain CWPP - Mountain Center - Threat



WUI Boundary
CDF Facilities
BDF Stations
Local Fire Stations
Mountain Peaks
Highways
Roads
Lake
Parcels
Extreme
Very High
High
Moderate
Non Fuel

N

Source: CDF/FRAP
Status as of 2004

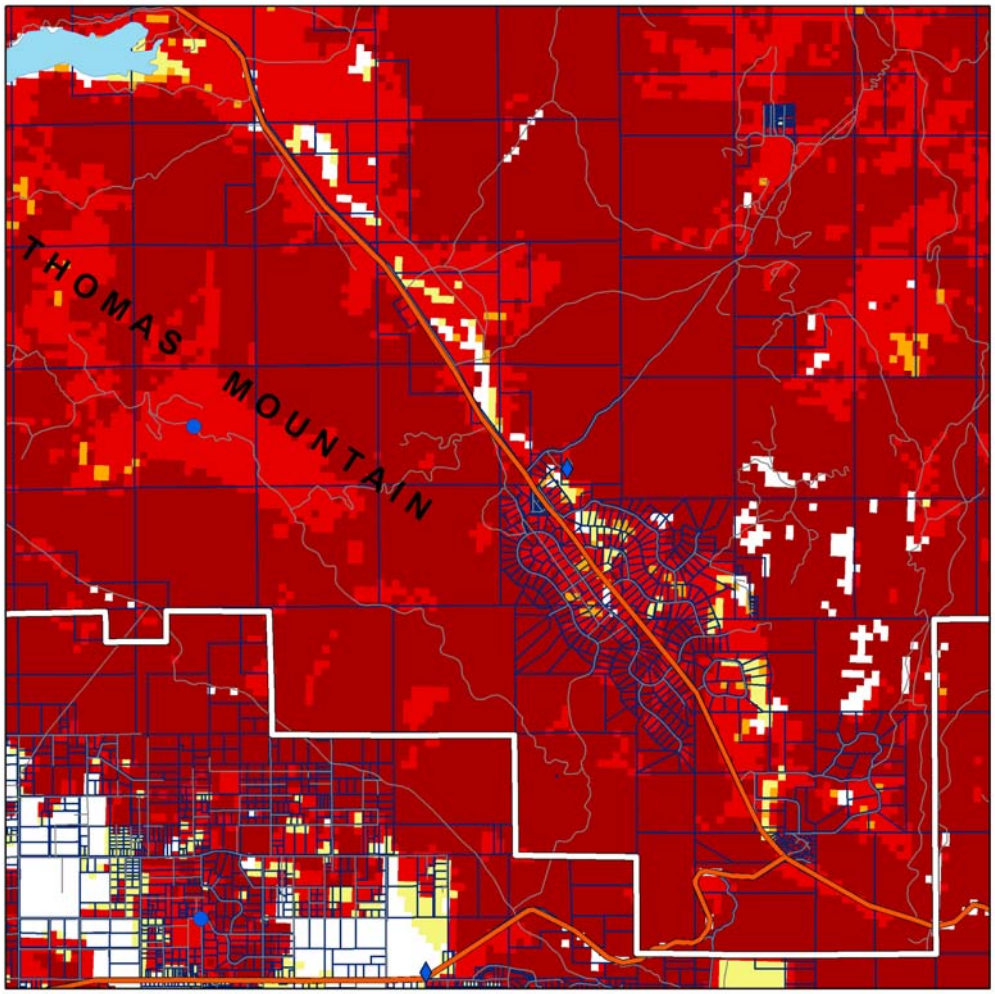
MAST
Mountain Area Safety Taskforce

0 0.1 0.2 0.4 0.6 0.8 Miles

A Healthy Forest is a Healthy Habitat
Mountain Communities FireSafe Council

Map – 29

# San Jacinto Mountain CWPP - Garner Valley - Fire Threat




WUI Boundary
CDF Facilities
BDF Stations
Mountain Peaks
Highways
Roads
Lake
Parcels
Extreme
Very High
High
Moderate
Non Fuel

N

Source: CDF/FRAP
Status as of 2004

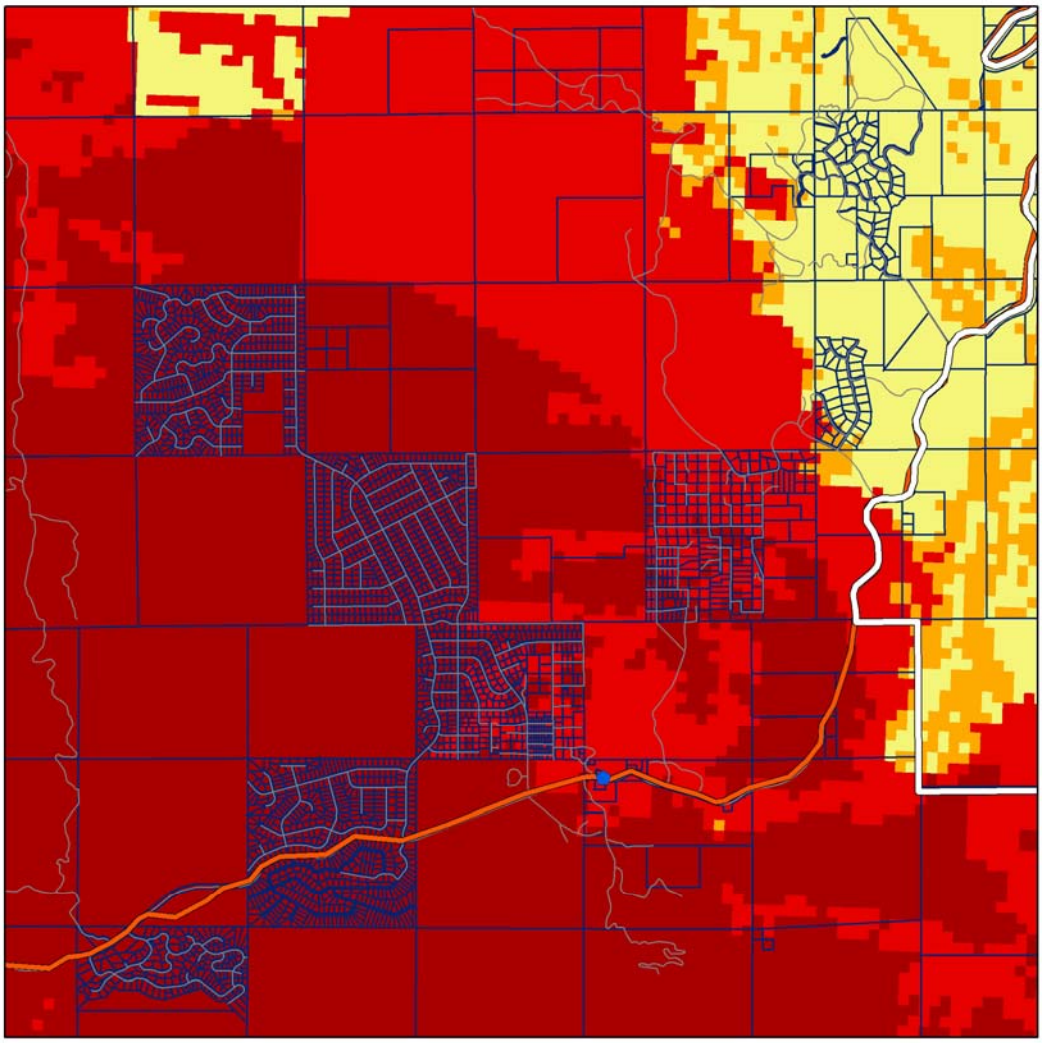
MAST
Mountain Area Safety Taskforce

0 0.35 0.7 1.4 2.1 2.8 Miles

A Healthy Forest is a Healthy Habitat
MOUNTAIN COMMUNITIES FireSafe COUNCIL

Map – 30

# San Jacinto Mountain CWPP - Pinyon - Threat



WUI Boundary
CDF Facilities
BDF Stations
Local Fire Stations

Mountain Peaks
Highways
Roads
Lake
Parcels

Extreme
Very High
High
Moderate
Non Fuel

N

Source: CDF/FRAP
Status as of 2004

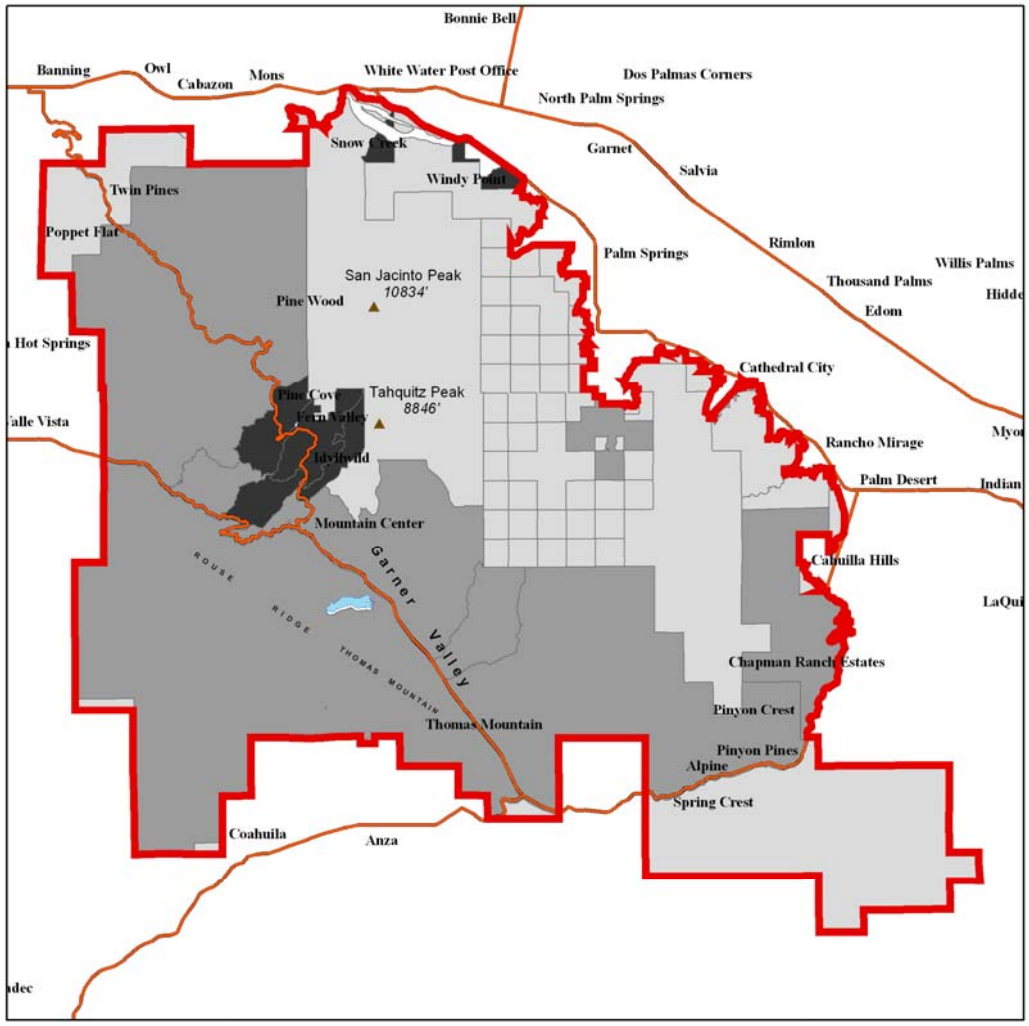
MAST
Mountain Area Safety Taskforce

0 0.25 0.5 1 1.5 2 Miles

A Healthy Forest is a Healthy Habitat
Mountain Communities Fire Safe Council

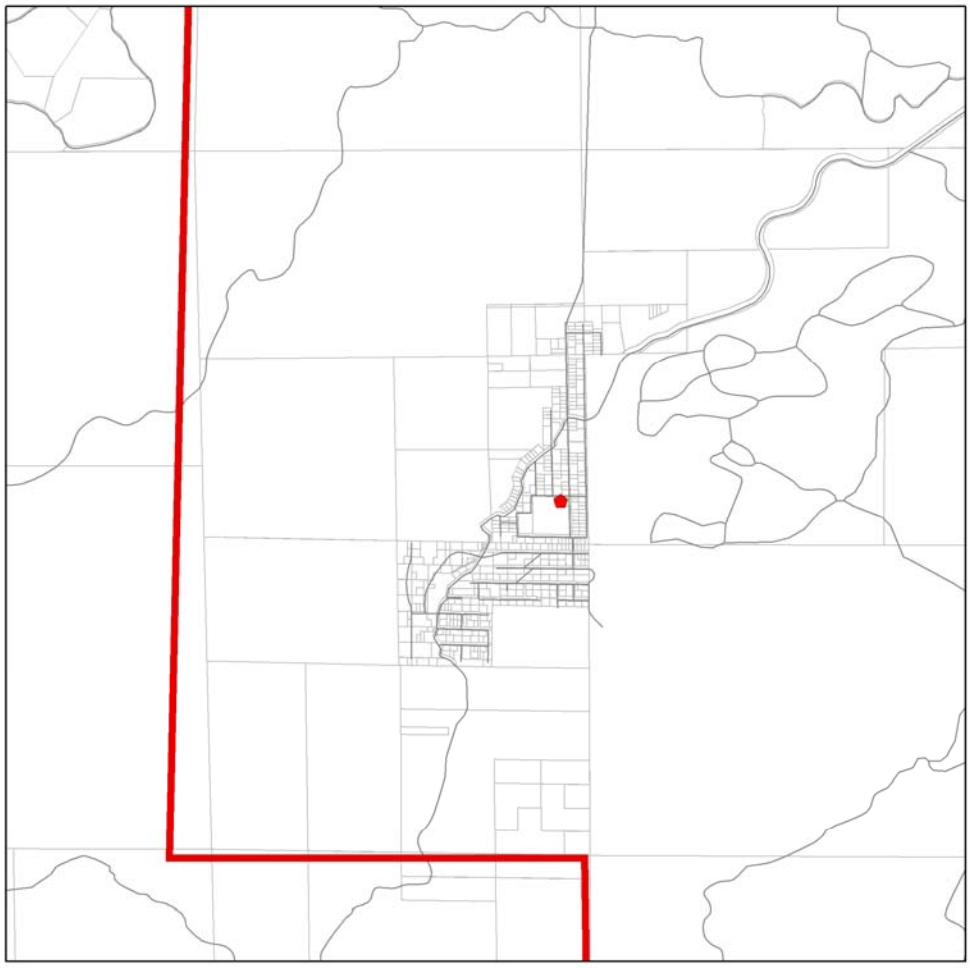
Map - 31

# San Jacinto Mountain CWPP - Residential Vacancy Rate



Map – 32

# San Jacinto Mountain CWPP - Poppet Flat - Treatment



WUI Boundary
Idyllwild Fire Station
CDF Facilities
BDF Stations
Local Fire Stations

Mountain Peaks
Highways
Roads
Lake
Parcels

Treatments Status
STATUS
Complete
In Progress
Planned

N

Source: CDF/FRAP
Status as of October 2005

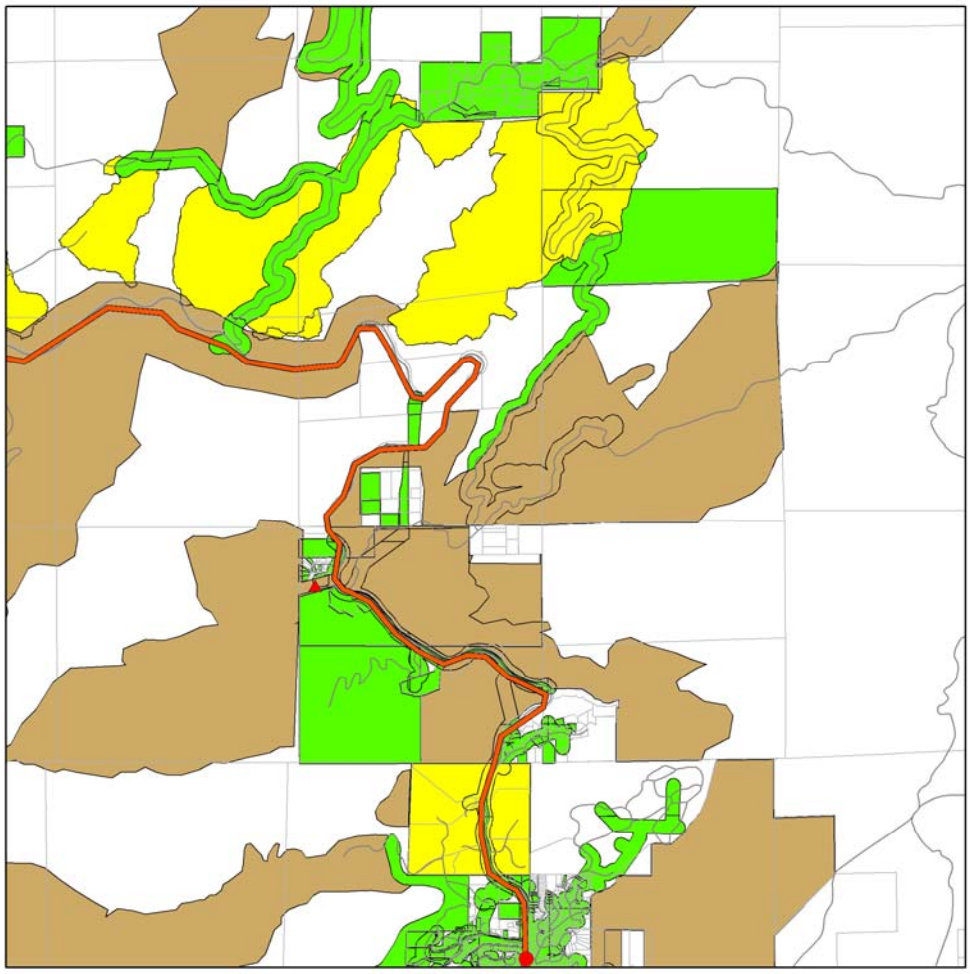
MAST
Mountain Area Safety Taskforce

0 0.1 0.2 0.4 0.6 0.8 Miles

A Healthy Forest is a Healthy Habitat
MOUNTAIN COMMUNITIES FireSafe COUNCIL

Map – 33

# San Jacinto Mountain CWPP - Pine Wood Treatment



WUI Boundary
CDF Facilities
BDF Stations
Local Fire Stations

Mountain Peaks
Highways
Roads
Lake
Parcels

Treatments
STATUS
Complete
In Progress
Planned

N

Source: CDF/FRAP
Status as of October 2005

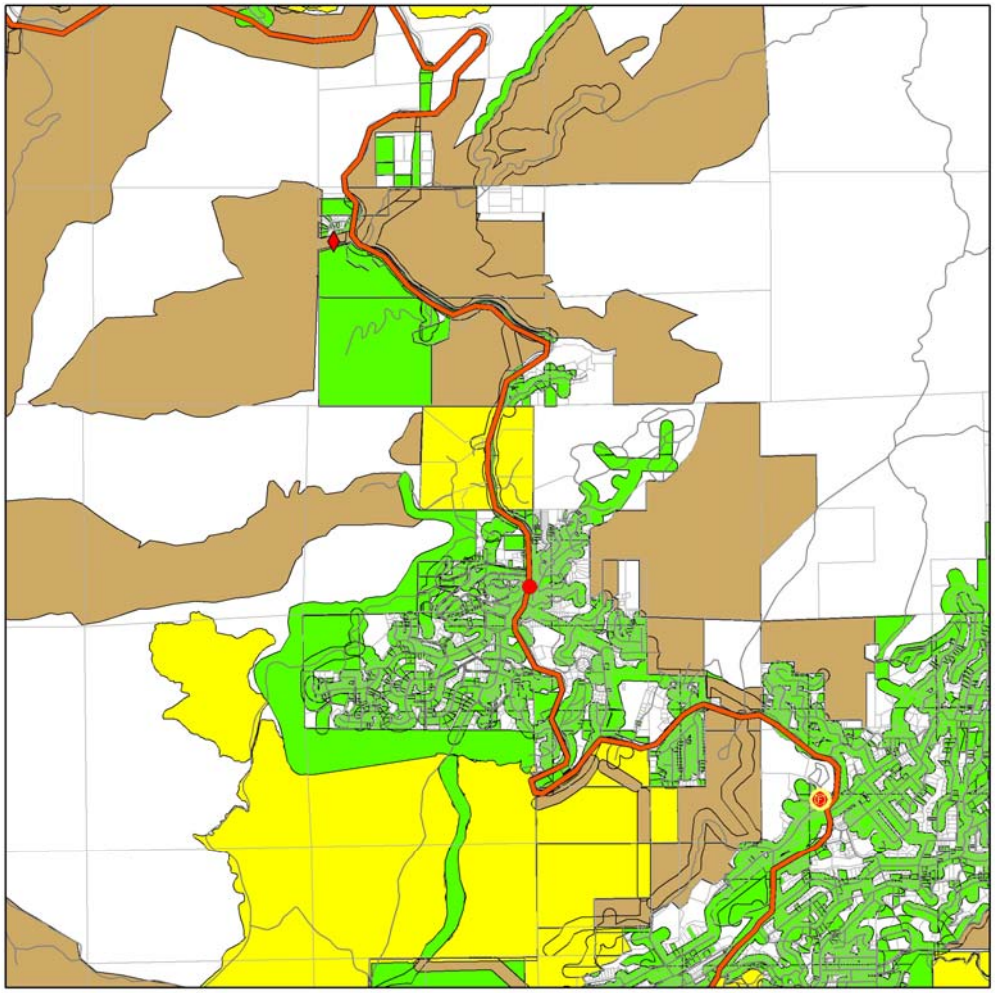
MAST
Mountain Area Safety Taskforce

0 0.15 0.3 0.6 0.9 1.2 Miles

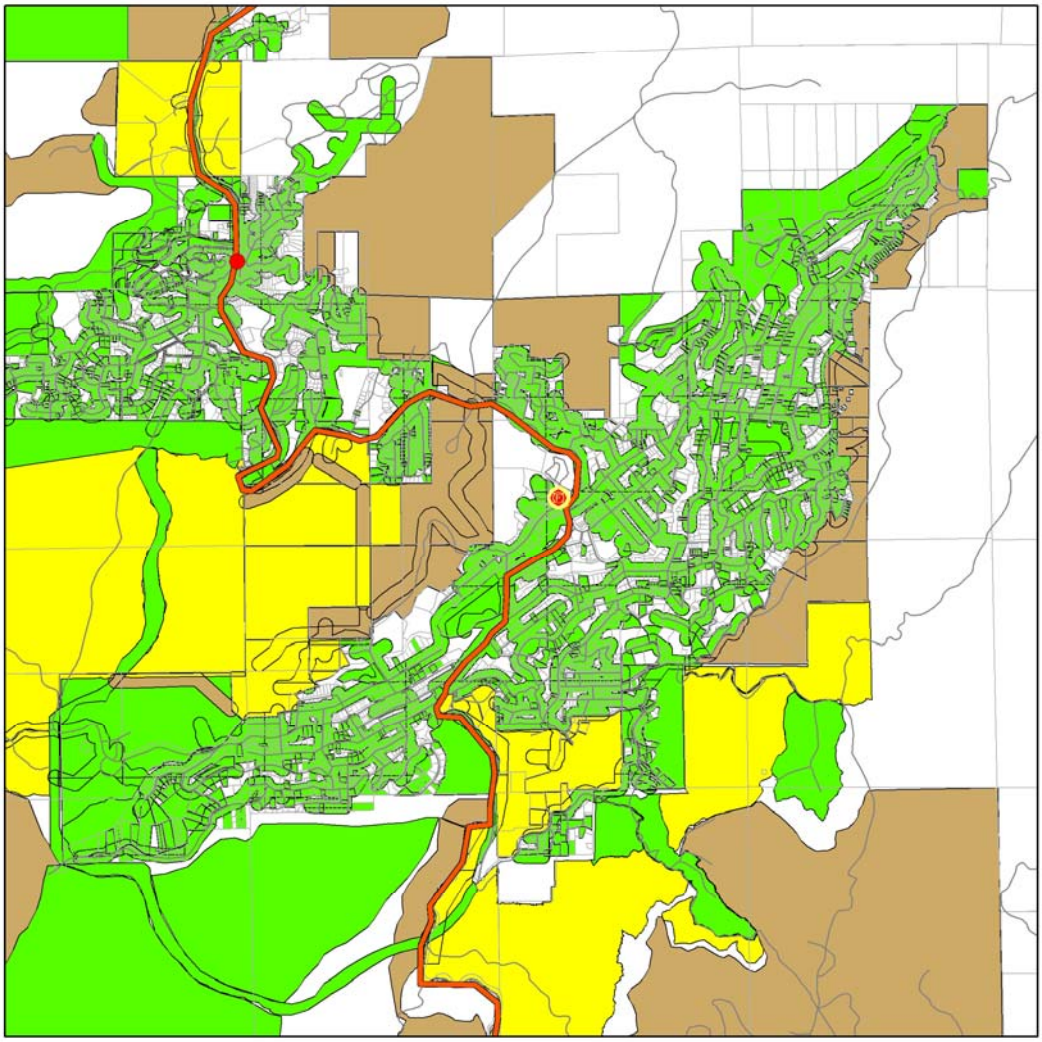
A Healthy Forest is a Healthy Habitat
Mountain Communities Fire Safe Council

Map – 34

# San Jacinto Mountain CWPP - Pine Cove Treatment



# San Jacinto Mountain CWPP - Idyllwild - Treatment



WUI Boundary
Idyllwild Fire Station
CDF Facilities
BDF Stations
Local Fire Stations

Mountain Peaks
Highways
Roads
Lake
Parcels

Treatments Status
STATUS
Complete
In Progress
Planned

N

Source: CDF/FRAP
Status as of October 2005

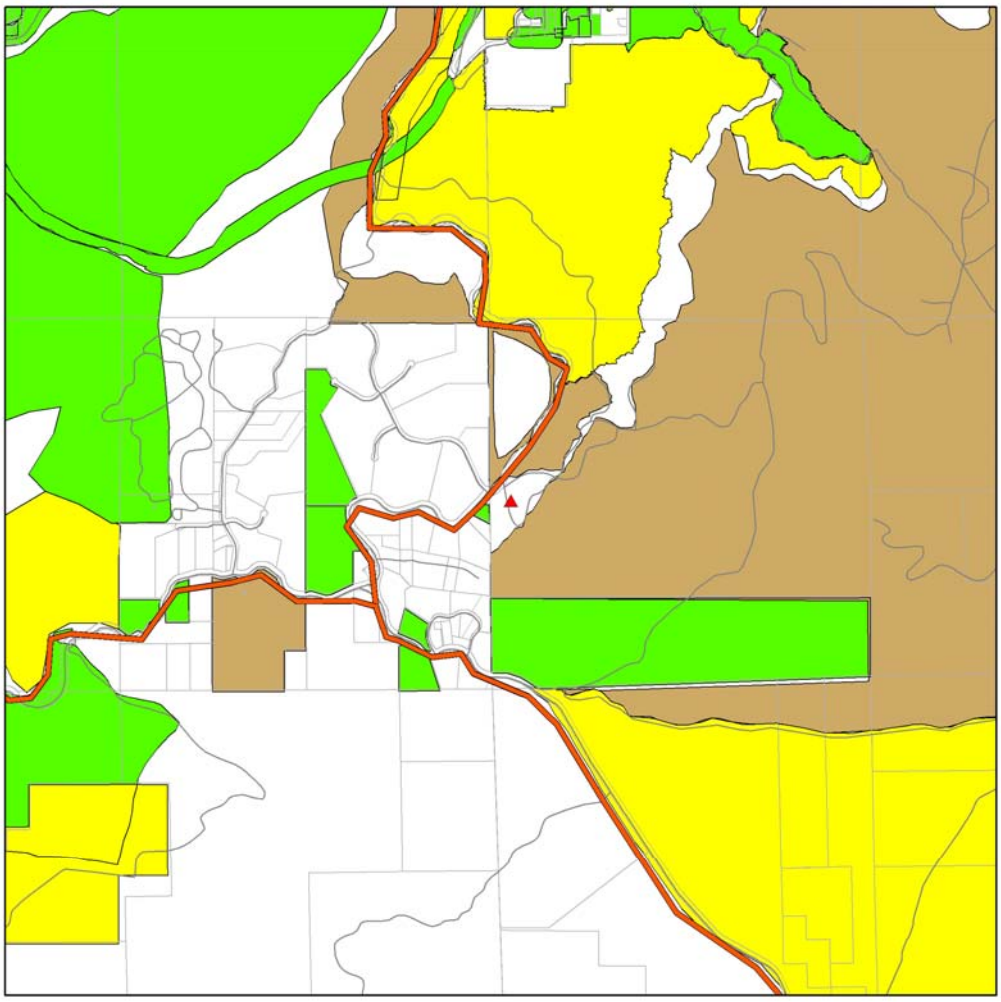
MAST
Mountain Area Safety Taskforce

0 0.15 0.3 0.6 0.9 1.2
Miles

A Healthy Forest is a Healthy Habitat
Mountain Communities Fire Safe Council

Map – 36

# San Jacinto Mountain CWPP - Mountain Center Treatment



WUI Boundary
CDF Facilities
BDF Stations
Local Fire Stations

Mountain Peaks
Highways
Roads
Lake
Parcels

Treatments Status
STATUS
Complete
In Progress
Planned

N

Source: CDF/FRAP
Status as of October 2005

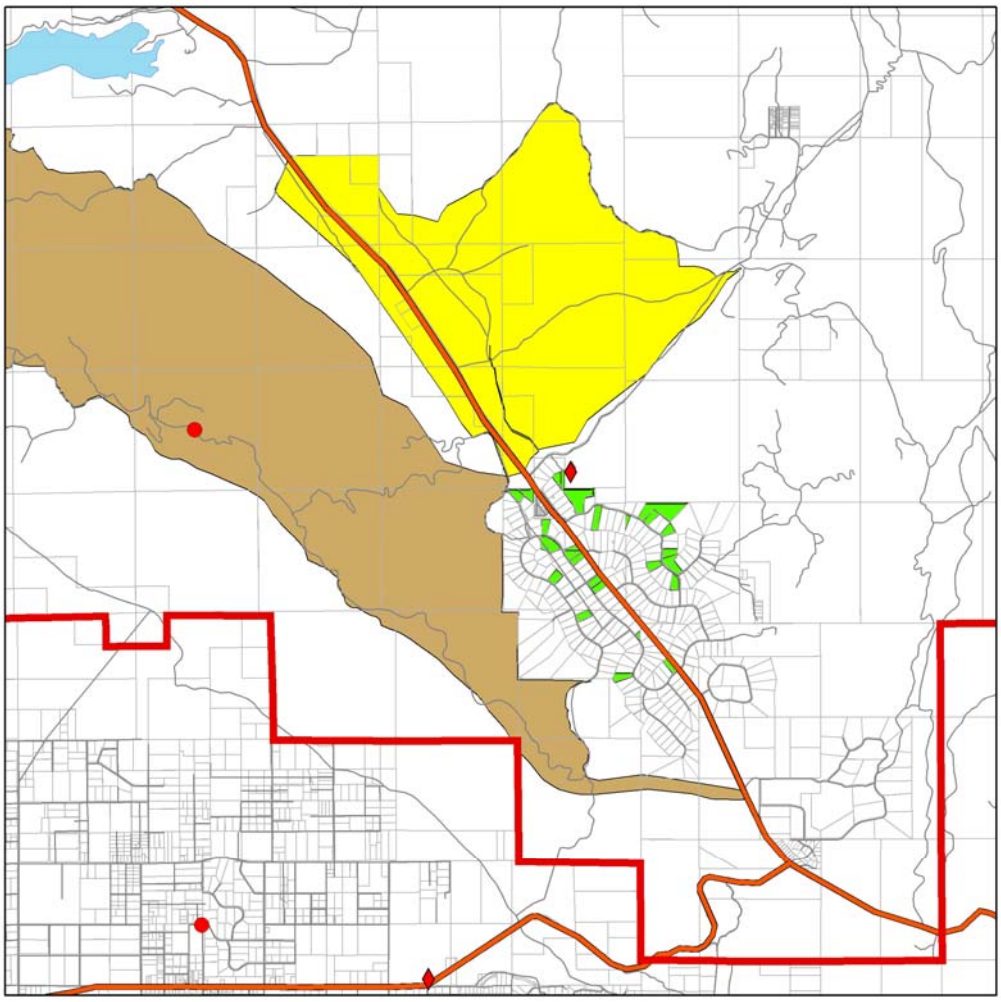
MAST
Mountain Area Safety Taskforce

0 0.1 0.2 0.4 0.6 0.8 Miles

A Healthy Forest is a Healthy Habitat
MOUNTAIN COMMUNITIES FireSafe COUNCIL

Map – 37

# San Jacinto Mountain CWPP - Garner Valley - Treatment



WUI Boundary
CDF Facilities
BDF Stations
Mountain Peaks

Highways
Roads
Lake
Parcels

STATUS
Complete
In Progress
Planned

N

Source: CDF/FRAP
Status as of October 2005

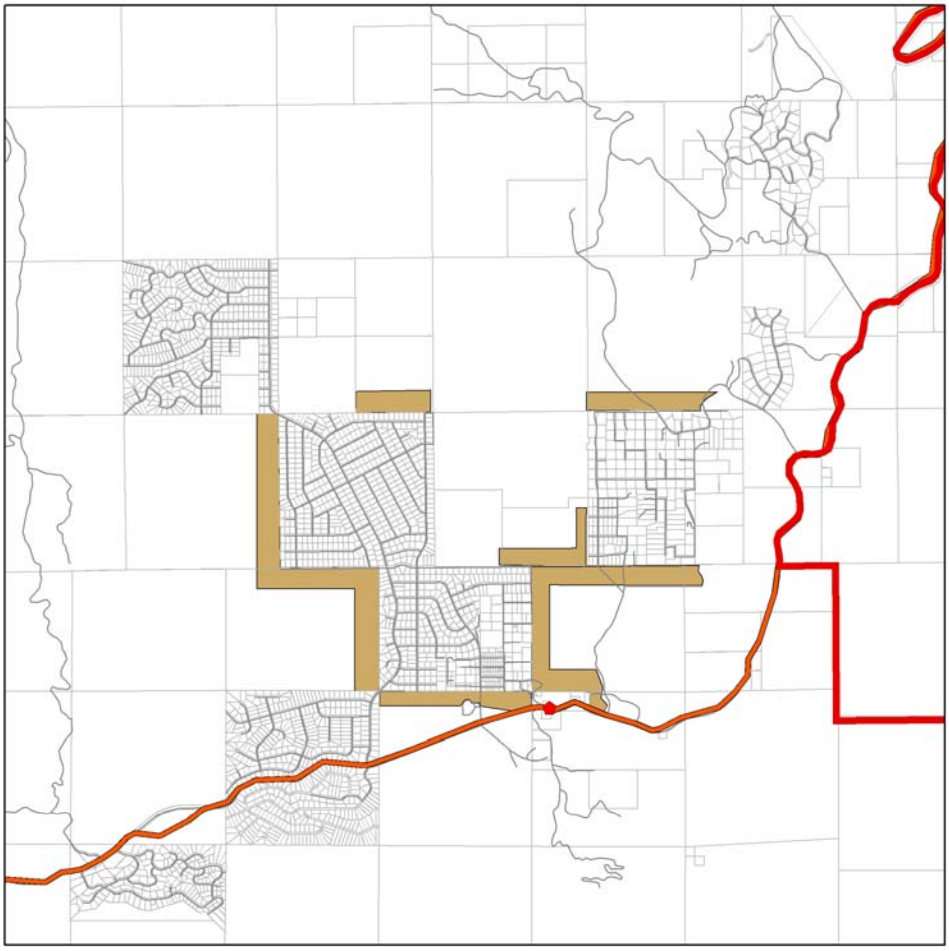
MAST
Mountain Area Safety Taskforce

0 0.35 0.7 1.4 2.1 2.8 Miles

A Healthy Forest is a Healthy Habitat
MOUNTAIN COMMUNITIES FireSafe COUNCIL

Map – 38

# San Jacinto Mountain CWPP - Pinyon - Treatment



WUI Boundary
Idyllwild Fire Station
CDF Facilities
BDF Stations
Local Fire Stations

Mountain Peaks
Highways
Roads
Lake
Parcels

Treatments Status
STATUS
Complete
In Progress
Planned

N

Source: CDF/FRAP

MAST
Mountain Area Safety Taskforce

0 0.25 0.5 1 1.5 2 Miles

A Healthy Forest is a Healthy Habitat
MOUNTAIN COMMUNITIES FireSafe COUNCIL

# Appendix F

## Healthy Forest Restoration Act of 2003

H. R. 1904

# One Hundred Eighth Congress of the United States of America

**AT THE FIRST SESSION**

***Begun and held at the City of Washington on Tuesday, the seventh day of January, two thousand and three***

# An Act

To improve the capacity of the Secretary of Agriculture and the Secretary of the Interior to conduct hazardous fuels reduction projects on National Forest System lands and Bureau of Land Management lands aimed at protecting communities, watersheds, and certain other at-risk lands from catastrophic wildfire, to enhance efforts to protect watersheds and address threats to forest and rangeland health, including catastrophic wildfire, across the landscape, and for other purposes.

*Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled,*

**SECTION 1. SHORT TITLE; TABLE OF CONTENTS.**

(a) SHORT TITLE.—This Act may be cited as the "Healthy Forests Restoration Act of 2003".

(b) TABLE OF CONTENTS.—The table of contents for this Act is as follows:

**SEC. 2. PURPOSES.**

The purposes of this Act are—

(1) to reduce wildfire risk to communities, municipal water supplies, and other at-risk Federal land through a collaborative process of planning, prioritizing, and implementing hazardous fuel reduction projects;

(2) to authorize grant programs to improve the commercial value of forest biomass (that otherwise contributes to the risk of catastrophic fire or insect or disease infestation) for producing electric energy, useful heat, transportation fuel, and petroleum-based product substitutes, and for other commercial purposes;

(3) to enhance efforts to protect watersheds and address threats to forest and rangeland health, including catastrophic wildfire, across the landscape;

(4) to promote systematic gathering of information to address the impact of insect and disease infestations and other damaging agents on forest and rangeland health;

(5) to improve the capacity to detect insect and disease infestations at an early stage, particularly with respect to hardwood forests; and

(6) to protect, restore, and enhance forest ecosystem components—

(A) to promote the recovery of threatened and endangered species;

(B) to improve biological diversity; and

(C) to enhance productivity and carbon sequestration.

**SEC. 3. DEFINITIONS.**

In this Act:

(1) FEDERAL LAND.—The term "Federal land" means—

(A) land of the National Forest System (as defined in section 11(a) of the Forest and Rangeland Renewable Resources Planning Act of 1974 (16 U.S.C. 1609(a))) administered by the Secretary of Agriculture, acting through the Chief of the Forest Service; and

(B) public lands (as defined in section 103 of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1702)), the surface of which is administered by the Secretary of the Interior, acting through the Director of the Bureau of Land Management.

(2) INDIAN TRIBE.—The term "Indian tribe" has the meaning given the term in section 4 of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450b).

# TITLE I—HAZARDOUS FUEL REDUCTION ON FEDERAL LAND

**SEC. 101. DEFINITIONS.**

In this title:

(1) AT-RISK COMMUNITY.—The term "at-risk community" means an area—

(A) that is comprised of—

(i) an interface community as defined in the notice entitled "Wildland Urban Interface Communities Within the Vicinity of Federal Lands That Are at High Risk From Wildfire" issued by the Secretary of Agriculture and the Secretary of the Interior in accordance with title IV of the Department of the Interior and Related Agencies Appropriations Act, 2001 (114 Stat. 1009) (66 Fed. Reg. 753, January 4, 2001); or

(ii) a group of homes and other structures with basic infrastructure and services (such as utilities and collectively maintained transportation routes) within or adjacent to Federal land;

(B) in which conditions are conducive to a large-scale wildland fire disturbance event; and

(C) for which a significant threat to human life or property exists as a result of a wildland fire disturbance event.

(2) AUTHORIZED HAZARDOUS FUEL REDUCTION PROJECT.—The term "authorized hazardous fuel reduction project" means the measures and methods described in the definition of "appropriate tools" contained in the glossary of the Implementation Plan, on Federal land described in section 102(a) and conducted under sections 103 and 104.

(3) COMMUNITY WILDFIRE PROTECTION PLAN.—The term "community wildfire protection plan" means a plan for an at-risk community that—

(A) is developed within the context of the collaborative agreements and the guidance established by the Wildland Fire Leadership Council and agreed to by the applicable local government, local fire department, and State agency responsible for forest management, in consultation with interested parties and the Federal land management agencies managing land in the vicinity of the at-risk community;

(B) identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment on Federal and non-Federal land that will protect 1 or more at-risk communities and essential infrastructure; and

(C) recommends measures to reduce structural ignitability throughout the at-risk community.

(4) CONDITION CLASS 2.—The term "condition class 2", with respect to an area of Federal land, means the condition class description developed by the Forest Service Rocky Mountain Research Station in the general technical report entitled "Development of Coarse-Scale Spatial Data for Wildland Fire and Fuel Management" (RMRS–87), dated April 2000 (including any subsequent revision to the report), under which—

(A) fire regimes on the land have been moderately altered from historical ranges;

(B) there exists a moderate risk of losing key ecosystem components from fire;

(C) fire frequencies have increased or decreased from historical frequencies by 1 or more return intervals, resulting in moderate changes to—

(i) the size, frequency, intensity, or severity of fires; or

(ii) landscape patterns; and

(D) vegetation attributes have been moderately altered from the historical range of the attributes.

(5) CONDITION CLASS 3.—The term "condition class 3", with respect to an area of Federal land, means the condition class description developed by the Rocky Mountain Research Station in the general technical report referred to in paragraph (4) (including any subsequent revision to the report), under which—

(A) fire regimes on land have been significantly altered from historical ranges;

(B) there exists a high risk of losing key ecosystem components from fire;

(C) fire frequencies have departed from historical frequencies by multiple return intervals, resulting in dramatic changes to—

(i) the size, frequency, intensity, or severity of fires; or

(ii) landscape patterns; and

(D) vegetation attributes have been significantly altered from the historical range of the attributes.

(6) DAY.—The term "day" means—

(A) a calendar day; or

(B) if a deadline imposed by this title would expire on a nonbusiness day, the end of the next business day.

(7) DECISION DOCUMENT.—The term "decision document" means—

(A) a decision notice (as that term is used in the Forest Service Handbook);

(B) a decision record (as that term is used in the Bureau of Land Management Handbook); and

(C) a record of decision (as that term is used in applicable regulations of the Council on Environmental Quality).

(8) FIRE REGIME I.—The term "fire regime I" means an area—

(A) in which historically there have been low-severity fires with a frequency of 0 through 35 years; and

(B) that is located primarily in low elevation forests of pine, oak, or pinyon juniper.

(9) FIRE REGIME II.—The term "fire regime II" means an area—

(A) in which historically there are stand replacement severity fires with a frequency of 0 through 35 years; and

(B) that is located primarily in low- to mid-elevation rangeland, grassland, or shrubland.

(10) FIRE REGIME III.—The term "fire regime III" means an area—

(A) in which historically there are mixed severity fires with a frequency of 35 through 100 years; and

(B) that is located primarily in forests of mixed conifer, dry Douglas fir, or wet Ponderosa pine.

(11) IMPLEMENTATION PLAN.—The term "Implementation Plan" means the Implementation Plan for the Comprehensive Strategy for a Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment, dated May 2002, developed pursuant to the conference report to accompany the Department of the Interior and Related Agencies Appropriations Act, 2001 (House Report No. 106–64) (and subsequent revisions).

(12) MUNICIPAL WATER SUPPLY SYSTEM.—The term "municipal water supply system" means the reservoirs, canals, ditches, flumes, laterals, pipes, pipelines, and other surface facilities and systems constructed or installed for the collection, impoundment, storage, transportation, or distribution of drinking water.

(13) RESOURCE MANAGEMENT PLAN.—The term "resource management plan" means—

(A) a land and resource management plan prepared for 1 or more units of land of the National Forest System described in section 3(1)(A) under section 6 of the Forest and Rangeland Renewable Resources Planning Act of 1974 (16 U.S.C. 1604); or

(B) a land use plan prepared for 1 or more units of the public land described in section 3(1)(B) under section 202 of the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1712).

(14) SECRETARY.—The term "Secretary" means—

(A) the Secretary of Agriculture, with respect to land of the National Forest System described in section 3(1)(A); and

(B) the Secretary of the Interior, with respect to public lands described in section 3(1)(B).

(15) THREATENED AND ENDANGERED SPECIES HABITAT.—The term "threatened and endangered species habitat" means Federal land identified in—

(A) a determination that a species is an endangered species or a threatened species under the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.);

(B) a designation of critical habitat of the species under that Act; or

(C) a recovery plan prepared for the species under that Act.

(16) WILDLAND-URBAN INTERFACE.—The term "wildland-urban interface" means—

(A) an area within or adjacent to an at-risk community that is identified in recommendations to the Secretary in a community wildfire protection plan; or

(B) in the case of any area for which a community wildfire protection plan is not in effect—

(i) an area extending ½-mile from the boundary of an at-risk community;

(ii) an area within 1½ miles of the boundary of an at-risk community, including any land that—

(I) has a sustained steep slope that creates the potential for wildfire behavior endangering the at-risk community;

(II) has a geographic feature that aids in creating an effective fire break, such as a road or ridge top; or

(III) is in condition class 3, as documented by the Secretary in the project-specific environmental analysis; and

(iii) an area that is adjacent to an evacuation route for an at-risk community that the Secretary determines, in cooperation with the at-risk community, requires hazardous fuel reduction to provide safer evacuation from the at-risk community.

**SEC. 102. AUTHORIZED HAZARDOUS FUEL REDUCTION PROJECTS.**

(a) AUTHORIZED PROJECTS.—As soon as practicable after the date of enactment of this Act, the Secretary shall implement authorized hazardous fuel reduction projects, consistent with the Implementation Plan, on—

(1) Federal land in wildland-urban interface areas;

(2) condition class 3 Federal land, in such proximity to a municipal water supply system or a stream feeding such a system within a municipal watershed that a significant risk exists that a fire disturbance event would have adverse effects on the water quality of the municipal water supply or the maintenance of the system, including a risk to water quality posed by erosion following such a fire disturbance event;

(3) condition class 2 Federal land located within fire regime I, fire regime II, or fire regime III, in such proximity to a municipal water supply system or a stream feeding such a system within a municipal watershed that a significant risk exists that a fire disturbance event would have adverse effects on the water quality of the municipal water supply or the maintenance of the system, including a risk to water quality posed by erosion following such a fire disturbance event;

(4) Federal land on which windthrow or blowdown, ice storm damage, the existence of an epidemic of disease or insects, or the presence of such an epidemic on immediately adjacent land and the imminent risk it will spread, poses a significant threat to an ecosystem component, or forest or rangeland resource, on the Federal land or adjacent non-Federal land; and

(5) Federal land not covered by paragraphs (1) through (4) that contains threatened and endangered species habitat, if—

(A) natural fire regimes on that land are identified as being important for, or wildfire is identified as a threat to, an endangered species, a threatened species, or habitat of an endangered species or threatened species in a species recovery plan prepared under section 4 of the Endangered Species Act of 1973 (16 U.S.C. 1533), or a notice published in the Federal Register determining a species to be an endangered species or a threatened species or designating critical habitat;

(B) the authorized hazardous fuel reduction project will provide enhanced protection from catastrophic wildfire

for the endangered species, threatened species, or habitat of the endangered species or threatened species; and

(C) the Secretary complies with any applicable guidelines specified in any management or recovery plan described in subparagraph (A).

(b) RELATION TO AGENCY PLANS.—An authorized hazardous fuel reduction project shall be conducted consistent with the resource management plan and other relevant administrative policies or decisions applicable to the Federal land covered by the project.

(c) ACREAGE LIMITATION.—Not more than a total of 20,000,000 acres of Federal land may be treated under authorized hazardous fuel reduction projects.

(d) EXCLUSION OF CERTAIN FEDERAL LAND.—The Secretary may not conduct an authorized hazardous fuel reduction project that would occur on—

(1) a component of the National Wilderness Preservation System;

(2) Federal land on which the removal of vegetation is prohibited or restricted by Act of Congress or Presidential proclamation (including the applicable implementation plan); or

(3) a Wilderness Study Area.

(e) OLD GROWTH STANDS.—

(1) DEFINITIONS.—In this subsection and subsection (f):

(A) APPLICABLE PERIOD.—The term "applicable period" means—

(i) the 2-year period beginning on the date of enactment of this Act; or

(ii) in the case of a resource management plan that the Secretary is in the process of revising as of the date of enactment of this Act, the 3-year period beginning on the date of enactment of this Act.

(B) COVERED PROJECT.—The term "covered project" means an authorized hazardous fuel reduction project carried out on land described in paragraph (1), (2), (3), or (5) of subsection (a).

(C) MANAGEMENT DIRECTION.—The term "management direction" means definitions, designations, standards, guidelines, goals, or objectives established for an old growth stand under a resource management plan developed in accordance with applicable law, including section 6(g)(3)(B) of the Forest and Rangeland Renewable Resources Planning Act of 1974 (16 U.S.C. 1604(g)(3)(B)).

(D) OLD GROWTH STAND.—The term "old growth stand" has the meaning given the term under management direction used pursuant to paragraphs (3) and (4), based on the structure and composition characteristic of the forest type, and in accordance with applicable law, including section 6(g)(3)(B) of the Forest and Rangeland Renewable Resources Planning Act of 1974 (16 U.S.C. 1604(g)(3)(B)).

(2) PROJECT REQUIREMENTS.—In carrying out a covered project, the Secretary shall fully maintain, or contribute toward the restoration of, the structure and composition of old growth stands according to the pre-fire suppression old growth conditions characteristic of the forest type, taking into account the contribution of the stand to landscape fire adaptation and

watershed health, and retaining the large trees contributing to old growth structure.

(3) NEWER MANAGEMENT DIRECTION.—

(A) IN GENERAL.—If the management direction for an old growth stand was established on or after December 15, 1993, the Secretary shall meet the requirements of paragraph (2) in carrying out a covered project by implementing the management direction.

(B) AMENDMENTS OR REVISIONS.—Any amendment or revision to management direction for which final administrative approval is granted after the date of enactment of this Act shall be consistent with paragraph (2) for the purpose of carrying out covered projects.

(4) OLDER MANAGEMENT DIRECTION.—

(A) IN GENERAL.—If the management direction for an old growth stand was established before December 15, 1993, the Secretary shall meet the requirements of paragraph (2) in carrying out a covered project during the applicable period by implementing the management direction.

(B) REVIEW REQUIRED.—Subject to subparagraph (C), during the applicable period for management direction referred to in subparagraph (A), the Secretary shall—

(i) review the management direction for affected covered projects, taking into account any relevant scientific information made available since the adoption of the management direction; and

(ii) amend the management direction for affected covered projects to be consistent with paragraph (2), if necessary to reflect relevant scientific information the Secretary did not consider in formulating the management direction.

(C) REVIEW NOT COMPLETED.—If the Secretary does not complete the review of the management direction in accordance with subparagraph (B) before the end of the applicable period, the Secretary shall not carry out any portion of affected covered projects in stands that are identified as old growth stands (based on substantial supporting evidence) by any person during scoping, within the period—

(i) beginning at the close of the applicable period for the management direction governing the affected covered projects; and

(ii) ending on the earlier of—

(I) the date the Secretary completes the action required by subparagraph (B) for the management direction applicable to the affected covered projects; or

(II) the date on which the acreage limitation specified in subsection (c) (as that limitation may be adjusted by a subsequent Act of Congress) is reached.

(5) LIMITATION TO COVERED PROJECTS.—Nothing in this subsection requires the Secretary to revise or otherwise amend a resource management plan to make the project requirements of paragraph (2) apply to an activity other than a covered project.

(f) LARGE TREE RETENTION.—

(1) IN GENERAL.—Except in old growth stands where the management direction is consistent with subsection (e)(2), the Secretary shall carry out a covered project in a manner that—

(A) focuses largely on small diameter trees, thinning, strategic fuel breaks, and prescribed fire to modify fire behavior, as measured by the projected reduction of uncharacteristically severe wildfire effects for the forest type (such as adverse soil impacts, tree mortality or other impacts); and

(B) maximizes the retention of large trees, as appropriate for the forest type, to the extent that the trees promote fire-resilient stands.

(2) WILDFIRE RISK.—Nothing in this subsection prevents achievement of the purposes described in section 2(1).

(g) MONITORING AND ASSESSING FOREST AND RANGELAND HEALTH.—

(1) IN GENERAL.—For each Forest Service administrative region and each Bureau of Land Management State Office, the Secretary shall—

(A) monitor the results of a representative sample of the projects authorized under this title for each management unit; and

(B) not later than 5 years after the date of enactment of this Act, and each 5 years thereafter, issue a report that includes—

(i) an evaluation of the progress towards project goals; and

(ii) recommendations for modifications to the projects and management treatments.

(2) CONSISTENCY OF PROJECTS WITH RECOMMENDATIONS.—An authorized hazardous fuel reduction project approved following the issuance of a monitoring report shall, to the maximum extent practicable, be consistent with any applicable recommendations in the report.

(3) SIMILAR VEGETATION TYPES.—The results of a monitoring report shall be made available for use (if appropriate) in an authorized hazardous fuels reduction project conducted in a similar vegetation type on land under the jurisdiction of the Secretary.

(4) MONITORING AND ASSESSMENTS.—Monitoring and assessment shall include a description of the changes in condition class, using the Fire Regime Condition Class Guidebook or successor guidance, specifically comparing end results to—

(A) pretreatment conditions;

(B) historical fire regimes; and

(C) any applicable watershed or landscape goals or objectives in the resource management plan or other relevant direction.

(5) MULTIPARTY MONITORING.—

(A) IN GENERAL.—In an area where significant interest is expressed in multiparty monitoring, the Secretary shall establish a multiparty monitoring, evaluation, and accountability process in order to assess the positive or negative ecological and social effects of authorized hazardous fuel reduction projects and projects conducted pursuant to section 404.

(B) DIVERSE STAKEHOLDERS.—The Secretary shall include diverse stakeholders (including interested citizens and Indian tribes) in the process required under subparagraph (A).

(C) FUNDING.—Funds to carry out this paragraph may be derived from operations funds for projects described in subparagraph (A).

(6) COLLECTION OF MONITORING DATA.—The Secretary may collect monitoring data by entering into cooperative agreements or contracts with, or providing grants to, small or micro-businesses, cooperatives, nonprofit organizations, Youth Conservation Corps work crews, or related State, local, and other non-Federal conservation corps.

(7) TRACKING.—For each administrative unit, the Secretary shall track acres burned, by the degree of severity, by large wildfires (as defined by the Secretary).

(8) MONITORING AND MAINTENANCE OF TREATED AREAS.—The Secretary shall, to the maximum extent practicable, develop a process for monitoring the need for maintenance of treated areas, over time, in order to preserve the forest health benefits achieved.

**SEC. 103. PRIORITIZATION.**

(a) IN GENERAL.—In accordance with the Implementation Plan, the Secretary shall develop an annual program of work for Federal land that gives priority to authorized hazardous fuel reduction projects that provide for the protection of at-risk communities or watersheds or that implement community wildfire protection plans.

(b) COLLABORATION.—

(1) IN GENERAL.—The Secretary shall consider recommendations under subsection (a) that are made by at-risk communities that have developed community wildfire protection plans.

(2) EXEMPTION.—The Federal Advisory Committee Act (5 U.S.C. App.) shall not apply to the planning process and recommendations concerning community wildfire protection plans.

(c) ADMINISTRATION.—

(1) IN GENERAL.—Federal agency involvement in developing a community wildfire protection plan, or a recommendation made in a community wildfire protection plan, shall not be considered a Federal agency action under the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.).

(2) COMPLIANCE.—In implementing authorized hazardous fuel reduction projects on Federal land, the Secretary shall, in accordance with section 104, comply with the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.).

(d) FUNDING ALLOCATION.—

(1) FEDERAL LAND.—

(A) IN GENERAL.—Subject to subparagraph (B), the Secretary shall use not less than 50 percent of the funds allocated for authorized hazardous fuel reduction projects in the wildland-urban interface.

(B) APPLICABILITY AND ALLOCATION.—The funding allocation in subparagraph (A) shall apply at the national level. The Secretary may allocate the proportion of funds differently than is required under subparagraph (A) within individual management units as appropriate, in particular

to conduct authorized hazardous fuel reduction projects on land described in section 102(a)(4).

(C) WILDLAND-URBAN INTERFACE.—In the case of an authorized hazardous fuel reduction project for which a decision notice is issued during the 1-year period beginning on the date of enactment of this Act, the Secretary shall use existing definitions of the term "wildland-urban interface" rather than the definition of that term provided under section 101.

(2) NON-FEDERAL LAND.—

(A) IN GENERAL.—In providing financial assistance under any provision of law for hazardous fuel reduction projects on non-Federal land, the Secretary shall consider recommendations made by at-risk communities that have developed community wildfire protection plans.

(B) PRIORITY.—In allocating funding under this paragraph, the Secretary should, to the maximum extent practicable, give priority to communities that have adopted a community wildfire protection plan or have taken proactive measures to encourage willing property owners to reduce fire risk on private property.

**SEC. 104. ENVIRONMENTAL ANALYSIS.**

(a) AUTHORIZED HAZARDOUS FUEL REDUCTION PROJECTS.—Except as otherwise provided in this title, the Secretary shall conduct authorized hazardous fuel reduction projects in accordance with—

(1) the National Environmental Policy Act of 1969 (42 U.S.C. 4331 et seq.); and

(2) other applicable laws.

(b) ENVIRONMENTAL ASSESSMENT OR ENVIRONMENTAL IMPACT STATEMENT.—The Secretary shall prepare an environmental assessment or an environmental impact statement pursuant to section 102(2) of the National Environmental Policy Act of 1969 (42 U.S.C. 4332(2)) for each authorized hazardous fuel reduction project.

(c) CONSIDERATION OF ALTERNATIVES.—

(1) IN GENERAL.—Except as provided in subsection (d), in the environmental assessment or environmental impact statement prepared under subsection (b), the Secretary shall study, develop, and describe—

(A) the proposed agency action;

(B) the alternative of no action; and

(C) an additional action alternative, if the additional alternative—

(i) is proposed during scoping or the collaborative process under subsection (f); and

(ii) meets the purpose and need of the project, in accordance with regulations promulgated by the Council on Environmental Quality.

(2) MULTIPLE ADDITIONAL ALTERNATIVES.—If more than 1 additional alternative is proposed under paragraph (1)(C), the Secretary shall—

(A) select which additional alternative to consider, which is a choice that is in the sole discretion of the Secretary; and

(B) provide a written record describing the reasons for the selection.

(d) ALTERNATIVE ANALYSIS PROCESS FOR PROJECTS IN WILDLAND-URBAN INTERFACE.—

(1) PROPOSED AGENCY ACTION AND 1 ACTION ALTERNATIVE.—For an authorized hazardous fuel reduction project that is proposed to be conducted in the wildland-urban interface, the Secretary is not required to study, develop, or describe more than the proposed agency action and 1 action alternative in the environmental assessment or environmental impact statement prepared pursuant to section 102(2) of the National Environmental Policy Act of 1969 (42 U.S.C. 4332(2)).

(2) PROPOSED AGENCY ACTION.—Notwithstanding paragraph (1), but subject to paragraph (3), if an authorized hazardous fuel reduction project proposed to be conducted in the wildland-urban interface is located no further than 1½ miles from the boundary of an at-risk community, the Secretary is not required to study, develop, or describe any alternative to the proposed agency action in the environmental assessment or environmental impact statement prepared pursuant to section 102(2) of the National Environmental Policy Act of 1969 (42 U.S.C. 4332(2)).

(3) PROPOSED AGENCY ACTION AND COMMUNITY WILDFIRE PROTECTION PLAN ALTERNATIVE.—In the case of an authorized hazardous fuel reduction project described in paragraph (2), if the at-risk community has adopted a community wildfire protection plan and the proposed agency action does not implement the recommendations in the plan regarding the general location and basic method of treatments, the Secretary shall evaluate the recommendations in the plan as an alternative to the proposed agency action in the environmental assessment or environmental impact statement prepared pursuant to section 102(2) of the National Environmental Policy Act of 1969 (42 U.S.C. 4332(2)).

(e) PUBLIC NOTICE AND MEETING.—

(1) PUBLIC NOTICE.—The Secretary shall provide notice of each authorized hazardous fuel reduction project in accordance with applicable regulations and administrative guidelines.

(2) PUBLIC MEETING.—During the preparation stage of each authorized hazardous fuel reduction project, the Secretary shall—

(A) conduct a public meeting at an appropriate location proximate to the administrative unit of the Federal land on which the authorized hazardous fuel reduction project will be conducted; and

(B) provide advance notice of the location, date, and time of the meeting.

(f) PUBLIC COLLABORATION.—In order to encourage meaningful public participation during preparation of authorized hazardous fuel reduction projects, the Secretary shall facilitate collaboration among State and local governments and Indian tribes, and participation of interested persons, during the preparation of each authorized fuel reduction project in a manner consistent with the Implementation Plan.

(g) ENVIRONMENTAL ANALYSIS AND PUBLIC COMMENT.—In accordance with section 102(2) of the National Environmental Policy Act of 1969 (42 U.S.C. 4332(2)) and the applicable regulations

and administrative guidelines, the Secretary shall provide an opportunity for public comment during the preparation of any environmental assessment or environmental impact statement for an authorized hazardous fuel reduction project.

(h) DECISION DOCUMENT.—The Secretary shall sign a decision document for authorized hazardous fuel reduction projects and provide notice of the final agency actions.

**SEC. 105. SPECIAL ADMINISTRATIVE REVIEW PROCESS.**

(a) INTERIM FINAL REGULATIONS.—

(1) IN GENERAL.—Not later than 30 days after the date of the enactment of this Act, the Secretary of Agriculture shall promulgate interim final regulations to establish a predecisional administrative review process for the period described in paragraph (2) that will serve as the sole means by which a person can seek administrative review regarding an authorized hazardous fuel reduction project on Forest Service land.

(2) PERIOD.—The predecisional administrative review process required under paragraph (1) shall occur during the period—

(A) beginning after the completion of the environmental assessment or environmental impact statement; and

(B) ending not later than the date of the issuance of the final decision approving the project.

(3) ELIGIBILITY.—To be eligible to participate in the administrative review process for an authorized hazardous fuel reduction project under paragraph (1), a person shall submit to the Secretary, during scoping or the public comment period for the draft environmental analysis for the project, specific written comments that relate to the proposed action.

(4) EFFECTIVE DATE.—The interim final regulations promulgated under paragraph (1) shall take effect on the date of promulgation of the regulations.

(b) FINAL REGULATIONS.—The Secretary shall promulgate final regulations to establish the process described in subsection (a)(1) after the interim final regulations have been published and reasonable time has been provided for public comment.

(c) ADMINISTRATIVE REVIEW.—

(1) IN GENERAL.—A person may bring a civil action challenging an authorized hazardous fuel reduction project in a Federal district court only if the person has challenged the authorized hazardous fuel reduction project by exhausting—

(A) the administrative review process established by the Secretary of Agriculture under this section; or

(B) the administrative hearings and appeals procedures established by the Department of the Interior.

(2) ISSUES.—An issue may be considered in the judicial review of an action under section 106 only if the issue was raised in an administrative review process described in paragraph (1).

(3) EXCEPTION.—

(A) IN GENERAL.—An exception to the requirement of exhausting the administrative review process before seeking judicial review shall be available if a Federal court finds that the futility or inadequacy exception applies to a specific plaintiff or claim.

(B) INFORMATION.—If an agency fails or is unable to make information timely available during the administrative review process, a court should evaluate whether the administrative review process was inadequate for claims or issues to which the information is material.

**SEC. 106. JUDICIAL REVIEW IN UNITED STATES DISTRICT COURTS.**

(a) VENUE.—Notwithstanding section 1391 of title 28, United States Code, or other applicable law, an authorized hazardous fuels reduction project conducted under this title shall be subject to judicial review only in the United States district court for a district in which the Federal land to be treated under the authorized hazardous fuels reduction project is located.

(b) EXPEDITIOUS COMPLETION OF JUDICIAL REVIEW.—In the judicial review of an action challenging an authorized hazardous fuel reduction project under subsection (a), Congress encourages a court of competent jurisdiction to expedite, to the maximum extent practicable, the proceedings in the action with the goal of rendering a final determination on jurisdiction, and (if jurisdiction exists) a final determination on the merits, as soon as practicable after the date on which a complaint or appeal is filed to initiate the action.

(c) INJUNCTIONS.—

(1) IN GENERAL.—Subject to paragraph (2), the length of any preliminary injunctive relief and stays pending appeal covering an authorized hazardous fuel reduction project carried out under this title shall not exceed 60 days.

(2) RENEWAL.—

(A) IN GENERAL.—A court of competent jurisdiction may issue 1 or more renewals of any preliminary injunction, or stay pending appeal, granted under paragraph (1).

(B) UPDATES.—In each renewal of an injunction in an action, the parties to the action shall present the court with updated information on the status of the authorized hazardous fuel reduction project.

(3) BALANCING OF SHORT- AND LONG-TERM EFFECTS.—As part of its weighing the equities while considering any request for an injunction that applies to an agency action under an authorized hazardous fuel reduction project, the court reviewing the project shall balance the impact to the ecosystem likely affected by the project of—

(A) the short- and long-term effects of undertaking the agency action; against

(B) the short- and long-term effects of not undertaking the agency action.

**SEC. 107. EFFECT OF TITLE.**

(a) OTHER AUTHORITY.—Nothing in this title affects, or otherwise biases, the use by the Secretary of other statutory or administrative authority (including categorical exclusions adopted to implement the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.)) to conduct a hazardous fuel reduction project on Federal land (including Federal land identified in section 102(d)) that is not conducted using the process authorized by section 104.

(b) NATIONAL FOREST SYSTEM.—For projects and activities of the National Forest System other than authorized hazardous fuel reduction projects, nothing in this title affects, or otherwise biases,

the notice, comment, and appeal procedures for projects and activities of the National Forest System contained in part 215 of title 36, Code of Federal Regulations, or the consideration or disposition of any legal action brought with respect to the procedures.

**SEC. 108. AUTHORIZATION OF APPROPRIATIONS.**

There is authorized to be appropriated $760,000,000 for each fiscal year to carry out—

(1) activities authorized by this title; and

(2) other hazardous fuel reduction activities of the Secretary, including making grants to States, local governments, Indian tribes, and other eligible recipients for activities authorized by law.

# TITLE II—BIOMASS

**SEC. 201. IMPROVED BIOMASS USE RESEARCH PROGRAM.**

(a) USES OF GRANTS, CONTRACTS, AND ASSISTANCE.—Section 307(d) of the Biomass Research and Development Act of 2000 (7 U.S.C. 7624 note; Public Law 106–224) is amended—

(1) in paragraph (3), by striking "or" at the end;

(2) in paragraph (4), by striking the period at the end and inserting "; or"; and

(3) by adding at the end the following:

"(5) research to integrate silviculture, harvesting, product development, processing information, and economic evaluation to provide the science, technology, and tools to forest managers and community developers for use in evaluating forest treatment and production alternatives, including—

"(A) to develop tools that would enable land managers, locally or in a several-State region, to estimate—

"(i) the cost to deliver varying quantities of wood to a particular location; and

"(ii) the amount that could be paid for stumpage if delivered wood was used for a specific mix of products;

"(B) to conduct research focused on developing appropriate thinning systems and equipment designs that are—

"(i) capable of being used on land without significant adverse effects on the land;

"(ii) capable of handling large and varied landscapes;

"(iii) adaptable to handling a wide variety of tree sizes;

"(iv) inexpensive; and

"(v) adaptable to various terrains; and

"(C) to develop, test, and employ in the training of forestry managers and community developers curricula materials and training programs on matters described in subparagraphs (A) and (B).".

(b) FUNDING.—Section 310(b) of the Biomass Research and Development Act of 2000 (7 U.S.C. 7624 note; Public Law 106–224) is amended by striking "$49,000,000" and inserting "$54,000,000".

**SEC. 202. RURAL REVITALIZATION THROUGH FORESTRY.**

Section 2371 of the Food, Agriculture, Conservation, and Trade Act of 1990 (7 U.S.C. 6601) is amended by adding at the end the following:

"(d) RURAL REVITALIZATION TECHNOLOGIES.—

"(1) IN GENERAL.—The Secretary of Agriculture, acting through the Chief of the Forest Service, in consultation with the State and Private Forestry Technology Marketing Unit at the Forest Products Laboratory, and in collaboration with eligible institutions, may carry out a program—

"(A) to accelerate adoption of technologies using biomass and small-diameter materials;

"(B) to create community-based enterprises through marketing activities and demonstration projects; and

"(C) to establish small-scale business enterprises to make use of biomass and small-diameter materials.

"(2) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated to carry out this subsection $5,000,000 for each of fiscal years 2004 through 2008.".

**SEC. 203. BIOMASS COMMERCIAL UTILIZATION GRANT PROGRAM.**

(a) IN GENERAL.—In addition to any other authority of the Secretary of Agriculture to make grants to a person that owns or operates a facility that uses biomass as a raw material to produce electric energy, sensible heat, transportation fuel, or substitutes for petroleum-based products, the Secretary may make grants to a person that owns or operates a facility that uses biomass for wood-based products or other commercial purposes to offset the costs incurred to purchase biomass.

(b) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated to carry out this section $5,000,000 for each of fiscal years 2004 through 2008.

# TITLE III—WATERSHED FORESTRY ASSISTANCE

**SEC. 301. FINDINGS AND PURPOSES.**

(a) FINDINGS.—Congress finds that—

(1) there has been a dramatic shift in public attitudes and perceptions about forest management, particularly in the understanding and practice of sustainable forest management;

(2) it is commonly recognized that the proper stewardship of forest land is essential to sustaining and restoring the health of watersheds;

(3) forests can provide essential ecological services in filtering pollutants, buffering important rivers and estuaries, and minimizing flooding, which makes forest restoration worthy of special focus; and

(4) strengthened education, technical assistance, and financial assistance for nonindustrial private forest landowners and communities, relating to the protection of watershed health, is needed to realize the expectations of the general public.

(b) PURPOSES.—The purposes of this title are—

(1) to improve landowner and public understanding of the connection between forest management and watershed health;

(2) to encourage landowners to maintain tree cover on property and to use tree plantings and vegetative treatments as creative solutions to watershed problems associated with varying land uses;

(3) to enhance and complement forest management and buffer use for watersheds, with an emphasis on community watersheds;

(4) to establish new partnerships and collaborative watershed approaches to forest management, stewardship, and conservation;

(5) to provide technical and financial assistance to States to deliver a coordinated program that enhances State forestry best-management practices programs, and conserves and improves forested land and potentially forested land, through technical, financial, and educational assistance to qualifying individuals and entities; and

(6) to maximize the proper management and conservation of wetland forests and to assist in the restoration of those forests.

**SEC. 302. WATERSHED FORESTRY ASSISTANCE PROGRAM.**

The Cooperative Forestry Assistance Act of 1978 is amended by inserting after section 5 (16 U.S.C. 2103a) the following:

**"SEC. 6. WATERSHED FORESTRY ASSISTANCE PROGRAM.**

"(a) DEFINITION OF NONINDUSTRIAL PRIVATE FOREST LAND.—In this section, the term 'nonindustrial private forest land' means rural land, as determined by the Secretary, that—

"(1) has existing tree cover or that is suitable for growing trees; and

"(2) is owned by any nonindustrial private individual, group, association, corporation, or other private legal entity, that has definitive decisionmaking authority over the land.

"(b) GENERAL AUTHORITY AND PURPOSE.—The Secretary, acting through the Chief of the Forest Service and (where appropriate) through the Cooperative State Research, Education, and Extension Service, may provide technical, financial, and related assistance to State foresters, equivalent State officials, or Cooperative Extension officials at land grant colleges and universities and 1890 institutions for the purpose of expanding State forest stewardship capacities and activities through State forestry best-management practices and other means at the State level to address watershed issues on non-Federal forested land and potentially forested land.

"(c) TECHNICAL ASSISTANCE TO PROTECT WATER QUALITY.—

"(1) IN GENERAL.—The Secretary, in cooperation with State foresters or equivalent State officials, shall engage interested members of the public, including nonprofit organizations and local watershed councils, to develop a program of technical assistance to protect water quality described in paragraph (2).

"(2) PURPOSE OF PROGRAM.—The program under this subsection shall be designed—

"(A) to build and strengthen watershed partnerships that focus on forested landscapes at the State, regional, and local levels;

"(B) to provide State forestry best-management practices and water quality technical assistance directly to owners of nonindustrial private forest land;

"(C) to provide technical guidance to land managers and policymakers for water quality protection through forest management;

"(D) to complement State and local efforts to protect water quality and provide enhanced opportunities for consultation and cooperation among Federal and State agencies charged with responsibility for water and watershed management; and

"(E) to provide enhanced forest resource data and support for improved implementation and monitoring of State forestry best-management practices.

"(3) IMPLEMENTATION.—In the case of a participating State, the program of technical assistance shall be implemented by State foresters or equivalent State officials.

"(d) WATERSHED FORESTRY COST-SHARE PROGRAM.—

"(1) IN GENERAL.—The Secretary shall establish a watershed forestry cost-share program—

"(A) which shall be—

"(i) administered by the Forest Service; and

"(ii) implemented by State foresters or equivalent State officials in participating States; and

"(B) under which funds or other support provided to participating States shall be made available for State forestry best-management practices programs and watershed forestry projects.

"(2) WATERSHED FORESTRY PROJECTS.—The State forester, an equivalent State official of a participating State, or a Cooperative Extension official at a land grant college or university or 1890 institution, in coordination with the State Forest Stewardship Coordinating Committee established under section 19(b) (or an equivalent committee) for that State, shall make awards to communities, nonprofit groups, and owners of nonindustrial private forest land under the program for watershed forestry projects described in paragraph (3).

"(3) PROJECT ELEMENTS AND OBJECTIVES.—A watershed forestry project shall accomplish critical forest stewardship, watershed protection, and restoration needs within a State by demonstrating the value of trees and forests to watershed health and condition through—

"(A) the use of trees as solutions to water quality problems in urban and rural areas;

"(B) community-based planning, involvement, and action through State, local, and nonprofit partnerships;

"(C) application of and dissemination of monitoring information on forestry best-management practices relating to watershed forestry;

"(D) watershed-scale forest management activities and conservation planning; and

"(E)(i) the restoration of wetland (as defined by the States) and stream-side forests; and

"(ii) the establishment of riparian vegetative buffers.

"(4) COST-SHARING.—

"(A) FEDERAL SHARE.—

"(i) FUNDS UNDER THIS SUBSECTION.—Funds provided under this subsection for a watershed forestry project may not exceed 75 percent of the cost of the project.

"(ii) OTHER FEDERAL FUNDS.—The percentage of the cost of a project described in clause (i) that is not covered by funds made available under this subsection may be paid using other Federal funding sources, except that the total Federal share of the costs of the project may not exceed 90 percent.

"(B) FORM.—The non-Federal share of the costs of a project may be provided in the form of cash, services, or other in-kind contributions.

"(5) PRIORITIZATION.—The State Forest Stewardship Coordinating Committee for a State, or equivalent State committee, shall prioritize watersheds in that State to target watershed forestry projects funded under this subsection.

"(6) WATERSHED FORESTER.—Financial and technical assistance shall be made available to the State Forester or equivalent State official to create a State watershed or best-management practice forester position to—

"(A) lead statewide programs; and

"(B) coordinate watershed-level projects.

"(e) DISTRIBUTION.—

"(1) IN GENERAL.—Of the funds made available for a fiscal year under subsection (g), the Secretary shall use—

"(A) at least 75 percent of the funds to carry out the cost-share program under subsection (d); and

"(B) the remainder of the funds to deliver technical assistance, education, and planning, at the local level, through the State Forester or equivalent State official.

"(2) SPECIAL CONSIDERATIONS.—Distribution of funds by the Secretary among States under paragraph (1) shall be made only after giving appropriate consideration to—

"(A) the acres of agricultural land, nonindustrial private forest land, and highly erodible land in each State;

"(B) the miles of riparian buffer needed;

"(C) the miles of impaired stream segments and other impaired water bodies where forestry practices can be used to restore or protect water resources;

"(D) the number of owners of nonindustrial private forest land in each State; and

"(E) water quality cost savings that can be achieved through forest watershed management.

"(f) WILLING OWNERS.—

"(1) IN GENERAL.—Participation of an owner of nonindustrial private forest land in the watershed forestry assistance program under this section is voluntary.

"(2) WRITTEN CONSENT.—The watershed forestry assistance program shall not be carried out on nonindustrial private forest land without the written consent of the owner of, or entity having definitive decisionmaking over, the nonindustrial private forest land.

"(g) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated to carry out this section $15,000,000 for each of fiscal years 2004 through 2008.".

**SEC. 303. TRIBAL WATERSHED FORESTRY ASSISTANCE.**

(a) IN GENERAL.—The Secretary of Agriculture (referred to in this section as the "Secretary"), acting through the Chief of the Forest Service, shall provide technical, financial, and related

assistance to Indian tribes for the purpose of expanding tribal stewardship capacities and activities through tribal forestry best-management practices and other means at the tribal level to address watershed issues on land under the jurisdiction of or administered by the Indian tribes.

(b) TECHNICAL ASSISTANCE TO PROTECT WATER QUALITY.—

(1) IN GENERAL.—The Secretary, in cooperation with Indian tribes, shall develop a program to provide technical assistance to protect water quality, as described in paragraph (2).

(2) PURPOSE OF PROGRAM.—The program under this subsection shall be designed—

(A) to build and strengthen watershed partnerships that focus on forested landscapes at the State, regional, tribal, and local levels;

(B) to provide tribal forestry best-management practices and water quality technical assistance directly to Indian tribes;

(C) to provide technical guidance to tribal land managers and policy makers for water quality protection through forest management;

(D) to complement tribal efforts to protect water quality and provide enhanced opportunities for consultation and cooperation among Federal agencies and tribal entities charged with responsibility for water and watershed management; and

(E) to provide enhanced forest resource data and support for improved implementation and monitoring of tribal forestry best-management practices.

(c) WATERSHED FORESTRY PROGRAM.—

(1) IN GENERAL.—The Secretary shall establish a watershed forestry program in cooperation with Indian tribes.

(2) PROGRAMS AND PROJECTS.—Funds or other support provided under the program shall be made available for tribal forestry best-management practices programs and watershed forestry projects.

(3) ANNUAL AWARDS.—The Secretary shall annually make awards to Indian tribes to carry out this subsection.

(4) PROJECT ELEMENTS AND OBJECTIVES.—A watershed forestry project shall accomplish critical forest stewardship, watershed protection, and restoration needs within land under the jurisdiction of or administered by an Indian tribe by demonstrating the value of trees and forests to watershed health and condition through—

(A) the use of trees as solutions to water quality problems;

(B) application of and dissemination of monitoring information on forestry best-management practices relating to watershed forestry;

(C) watershed-scale forest management activities and conservation planning;

(D) the restoration of wetland and stream-side forests and the establishment of riparian vegetative buffers; and

(E) tribal-based planning, involvement, and action through State, tribal, local, and nonprofit partnerships.

(5) PRIORITIZATION.—An Indian tribe that participates in the program under this subsection shall prioritize watersheds in land under the jurisdiction of or administered by the Indian

tribe to target watershed forestry projects funded under this subsection.

(6) WATERSHED FORESTER.—The Secretary may provide to Indian tribes under this section financial and technical assistance to establish a position of tribal forester to lead tribal programs and coordinate small watershed-level projects.

(d) DISTRIBUTION.—The Secretary shall devote—

(1) at least 75 percent of the funds made available for a fiscal year under subsection (e) to the program under subsection (c); and

(2) the remainder of the funds to deliver technical assistance, education, and planning in the field to Indian tribes.

(e) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated to carry out this section $2,500,000 for each of fiscal years 2004 through 2008.

# TITLE IV—INSECT INFESTATIONS AND RELATED DISEASES

**SEC. 401. FINDINGS AND PURPOSE.**

(a) FINDINGS.—Congress finds that—

(1) high levels of tree mortality resulting from insect infestation (including the interaction between insects and diseases) may result in—

(A) increased fire risk;

(B) loss of old trees and old growth;

(C) loss of threatened and endangered species;

(D) loss of species diversity;

(E) degraded watershed conditions;

(F) increased potential for damage from other agents of disturbance, including exotic, invasive species; and

(G) decreased timber values;

(2)(A) forest-damaging insects destroy hundreds of thousands of acres of trees each year;

(B) in the West, more than 21,000,000 acres are at high risk of forest-damaging insect infestation, and in the South, more than 57,000,000 acres are at risk across all land ownerships; and

(C) severe drought conditions in many areas of the South and West will increase the risk of forest-damaging insect infestations;

(3) the hemlock woolly adelgid is—

(A) destroying streamside forests throughout the mid-Atlantic and Appalachian regions;

(B) threatening water quality and sensitive aquatic species; and

(C) posing a potential threat to valuable commercial timber land in northern New England;

(4)(A) the emerald ash borer is a nonnative, invasive pest that has quickly become a major threat to hardwood forests because an emerald ash borer infestation is almost always fatal to affected trees; and

(B) the emerald ash borer pest threatens to destroy more than 692,000,000 ash trees in forests in Michigan and Ohio alone, and between 5 and 10 percent of urban street trees in the Upper Midwest;

(5)(A) epidemic populations of Southern pine beetles are ravaging forests in Alabama, Arkansas, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, Tennessee, and Virginia; and

(B) in 2001, Florida and Kentucky experienced 146 percent and 111 percent increases, respectively, in Southern pine beetle populations;

(6) those epidemic outbreaks of Southern pine beetles have forced private landowners to harvest dead and dying trees, in rural areas and increasingly urbanized settings;

(7) according to the Forest Service, recent outbreaks of the red oak borer in Arkansas and Missouri have been unprecedented, with more than 1,000,000 acres infested at population levels never seen before;

(8) much of the damage from the red oak borer has taken place in national forests, and the Federal response has been inadequate to protect forest ecosystems and other ecological and economic resources;

(9)(A) previous silvicultural assessments, while useful and informative, have been limited in scale and scope of application; and

(B) there have not been sufficient resources available to adequately test a full array of individual and combined applied silvicultural assessments;

(10) only through the full funding, development, and assessment of potential applied silvicultural assessments over specific time frames across an array of environmental and climatic conditions can the most innovative and cost effective management applications be determined that will help reduce the susceptibility of forest ecosystems to attack by forest pests;

(11)(A) often, there are significant interactions between insects and diseases;

(B) many diseases (such as white pine blister rust, beech bark disease, and many other diseases) can weaken trees and forest stands and predispose trees and forest stands to insect attack; and

(C) certain diseases are spread using insects as vectors (including Dutch elm disease and pine pitch canker); and

(12) funding and implementation of an initiative to combat forest pest infestations and associated diseases should not come at the expense of supporting other programs and initiatives of the Secretary.

(b) PURPOSES.—The purposes of this title are—

(1) to require the Secretary to develop an accelerated basic and applied assessment program to combat infestations by forest-damaging insects and associated diseases;

(2) to enlist the assistance of colleges and universities (including forestry schools, land grant colleges and universities, and 1890 Institutions), State agencies, and private landowners to carry out the program; and

(3) to carry out applied silvicultural assessments.

**SEC. 402. DEFINITIONS.**

In this title:

(1) APPLIED SILVICULTURAL ASSESSMENT.—

(A) IN GENERAL.—The term "applied silvicultural assessment" means any vegetative or other treatment carried out for information gathering and research purposes.

(B) INCLUSIONS.—The term "applied silvicultural assessment" includes timber harvesting, thinning, prescribed burning, pruning, and any combination of those activities.

(2) 1890 INSTITUTION.—

(A) IN GENERAL.—The term "1890 Institution" means a college or university that is eligible to receive funds under the Act of August 30, 1890 (7 U.S.C. 321 et seq.).

(B) INCLUSION.—The term "1890 Institution" includes Tuskegee University.

(3) FOREST-DAMAGING INSECT.—The term "forest-damaging insect" means—

(A) a Southern pine beetle;

(B) a mountain pine beetle;

(C) a spruce bark beetle;

(D) a gypsy moth;

(E) a hemlock woolly adelgid;

(F) an emerald ash borer;

(G) a red oak borer;

(H) a white oak borer; and

(I) such other insects as may be identified by the Secretary.

(4) SECRETARY.—The term "Secretary" means—

(A) the Secretary of Agriculture, acting through the Forest Service, with respect to National Forest System land; and

(B) the Secretary of the Interior, acting through appropriate offices of the United States Geological Survey, with respect to federally owned land administered by the Secretary of the Interior.

**SEC. 403. ACCELERATED INFORMATION GATHERING REGARDING FOREST-DAMAGING INSECTS.**

(a) INFORMATION GATHERING.—The Secretary, acting through the Forest Service and United States Geological Survey, as appropriate, shall establish an accelerated program—

(1) to plan, conduct, and promote comprehensive and systematic information gathering on forest-damaging insects and associated diseases, including an evaluation of—

(A) infestation prevention and suppression methods;

(B) effects of infestations and associated disease interactions on forest ecosystems;

(C) restoration of forest ecosystem efforts;

(D) utilization options regarding infested trees; and

(E) models to predict the occurrence, distribution, and impact of outbreaks of forest-damaging insects and associated diseases;

(2) to assist land managers in the development of treatments and strategies to improve forest health and reduce the susceptibility of forest ecosystems to severe infestations of forest-damaging insects and associated diseases on Federal land and State and private land; and

(3) to disseminate the results of the information gathering, treatments, and strategies.

(b) COOPERATION AND ASSISTANCE.—The Secretary shall—

(1) establish and carry out the program in cooperation with—

(A) scientists from colleges and universities (including forestry schools, land grant colleges and universities, and 1890 Institutions);

(B) Federal, State, and local agencies; and

(C) private and industrial landowners; and

(2) designate such colleges and universities to assist in carrying out the program.

**SEC. 404. APPLIED SILVICULTURAL ASSESSMENTS.**

(a) ASSESSMENT EFFORTS.—For information gathering and research purposes, the Secretary may conduct applied silvicultural assessments on Federal land that the Secretary determines is at risk of infestation by, or is infested with, forest-damaging insects.

(b) LIMITATIONS.—

(1) EXCLUSION OF CERTAIN AREAS.—Subsection (a) does not apply to—

(A) a component of the National Wilderness Preservation System;

(B) any Federal land on which, by Act of Congress or Presidential proclamation, the removal of vegetation is restricted or prohibited;

(C) a congressionally-designated wilderness study area; or

(D) an area in which activities under subsection (a) would be inconsistent with the applicable land and resource management plan.

(2) CERTAIN TREATMENT PROHIBITED.—Nothing in subsection (a) authorizes the application of insecticides in municipal watersheds or associated riparian areas.

(3) PEER REVIEW.—

(A) IN GENERAL.—Before being carried out, each applied silvicultural assessment under this title shall be peer reviewed by scientific experts selected by the Secretary, which shall include non-Federal experts.

(B) EXISTING PEER REVIEW PROCESSES.—The Secretary may use existing peer review processes to the extent the processes comply with subparagraph (A).

(c) PUBLIC NOTICE AND COMMENT.—

(1) PUBLIC NOTICE.—The Secretary shall provide notice of each applied silvicultural assessment proposed to be carried out under this section.

(2) PUBLIC COMMENT.—The Secretary shall provide an opportunity for public comment before carrying out an applied silviculture assessment under this section.

(d) CATEGORICAL EXCLUSION.—

(1) IN GENERAL.—Applied silvicultural assessment and research treatments carried out under this section on not more than 1,000 acres for an assessment or treatment may be categorically excluded from documentation in an environmental impact statement and environmental assessment under the National Environmental Policy Act of 1969 (42 U.S.C. 4321 et seq.).

(2) ADMINISTRATION.—Applied silvicultural assessments and research treatments categorically excluded under paragraph (1)—

(A) shall not be carried out in an area that is adjacent to another area that is categorically excluded under paragraph (1) that is being treated with similar methods; and

(B) shall be subject to the extraordinary circumstances procedures established by the Secretary pursuant to section 1508.4 of title 40, Code of Federal Regulations.

(3) MAXIMUM CATEGORICAL EXCLUSION.—The total number of acres categorically excluded under paragraph (1) shall not exceed 250,000 acres.

(4) NO ADDITIONAL FINDINGS REQUIRED.—In accordance with paragraph (1), the Secretary shall not be required to make any findings as to whether an applied silvicultural assessment project, either individually or cumulatively, has a significant effect on the environment.

**SEC. 405. RELATION TO OTHER LAWS.**

The authority provided to each Secretary under this title is supplemental to, and not in lieu of, any authority provided to the Secretaries under any other law.

**SEC. 406. AUTHORIZATION OF APPROPRIATIONS.**

There are authorized to be appropriated such sums as are necessary to carry out this title for each of fiscal years 2004 through 2008.

# TITLE V—HEALTHY FORESTS RESERVE PROGRAM

**SEC. 501. ESTABLISHMENT OF HEALTHY FORESTS RESERVE PROGRAM.**

(a) ESTABLISHMENT.—The Secretary of Agriculture shall establish the healthy forests reserve program for the purpose of restoring and enhancing forest ecosystems—

(1) to promote the recovery of threatened and endangered species;

(2) to improve biodiversity; and

(3) to enhance carbon sequestration.

(b) COORDINATION.—The Secretary of Agriculture shall carry out the healthy forests reserve program in coordination with the Secretary of the Interior and the Secretary of Commerce.

**SEC. 502. ELIGIBILITY AND ENROLLMENT OF LANDS IN PROGRAM.**

(a) IN GENERAL.—The Secretary of Agriculture, in coordination with the Secretary of the Interior and the Secretary of Commerce, shall describe and define forest ecosystems that are eligible for enrollment in the healthy forests reserve program.

(b) ELIGIBILITY.—To be eligible for enrollment in the healthy forests reserve program, land shall be—

(1) private land the enrollment of which will restore, enhance, or otherwise measurably increase the likelihood of recovery of a species listed as endangered or threatened under section 4 of the Endangered Species Act of 1973 (16 U.S.C. 1533); and

(2) private land the enrollment of which will restore, enhance, or otherwise measurably improve the well-being of species that—

(A) are not listed as endangered or threatened under section 4 of the Endangered Species Act of 1973 (16 U.S.C. 1533); but

(B) are candidates for such listing, State-listed species, or special concern species.

(c) OTHER CONSIDERATIONS.—In enrolling land that satisfies the criteria under subsection (b), the Secretary of Agriculture shall give additional consideration to land the enrollment of which will—

(1) improve biological diversity; and

(2) increase carbon sequestration.

(d) ENROLLMENT BY WILLING OWNERS.—The Secretary of Agriculture shall enroll land in the healthy forests reserve program only with the consent of the owner of the land.

(e) MAXIMUM ENROLLMENT.—The total number of acres enrolled in the healthy forests reserve program shall not exceed 2,000,000 acres.

(f) METHODS OF ENROLLMENT.—

(1) IN GENERAL.—Land may be enrolled in the healthy forests reserve program in accordance with—

(A) a 10-year cost-share agreement;

(B) a 30-year easement; or

(C) an easement of not more than 99 years.

(2) PROPORTION.—The extent to which each enrollment method is used shall be based on the approximate proportion of owner interest expressed in that method in comparison to the other methods.

(g) ENROLLMENT PRIORITY.—

(1) SPECIES.—The Secretary of Agriculture shall give priority to the enrollment of land that provides the greatest conservation benefit to—

(A) primarily, species listed as endangered or threatened under section 4 of the Endangered Species Act of 1973 (16 U.S.C. 1533); and

(B) secondarily, species that—

(i) are not listed as endangered or threatened under section 4 of the Endangered Species Act of 1973 (16 U.S.C. 1533); but

(ii) are candidates for such listing, State-listed species, or special concern species.

(2) COST-EFFECTIVENESS.—The Secretary of Agriculture shall also consider the cost-effectiveness of each agreement or easement, and associated restoration plans, so as to maximize the environmental benefits per dollar expended.

**SEC. 503. RESTORATION PLANS.**

(a) IN GENERAL.—Land enrolled in the healthy forests reserve program shall be subject to a restoration plan, to be developed jointly by the landowner and the Secretary of Agriculture, in coordination with the Secretary of Interior.

(b) PRACTICES.—The restoration plan shall require such restoration practices as are necessary to restore and enhance habitat for—

(1) species listed as endangered or threatened under section 4 of the Endangered Species Act of 1973 (16 U.S.C. 1533); and

(2) animal or plant species before the species reach threatened or endangered status, such as candidate, State-listed species, and special concern species.

**SEC. 504. FINANCIAL ASSISTANCE.**

(a) EASEMENTS OF NOT MORE THAN 99 YEARS.—In the case of land enrolled in the healthy forests reserve program using an easement of not more than 99 years described in section 502(f)(1)(C), the Secretary of Agriculture shall pay the owner of the land an amount equal to not less than 75 percent, nor more than 100 percent, of (as determined by the Secretary)—

(1) the fair market value of the enrolled land during the period the land is subject to the easement, less the fair market value of the land encumbered by the easement; and

(2) the actual costs of the approved conservation practices or the average cost of approved practices carried out on the land during the period in which the land is subject to the easement.

(b) THIRTY-YEAR EASEMENT.—In the case of land enrolled in the healthy forests reserve program using a 30-year easement, the Secretary of Agriculture shall pay the owner of the land an amount equal to not more than (as determined by the Secretary)—

(1) 75 percent of the fair market value of the land, less the fair market value of the land encumbered by the easement; and

(2) 75 percent of the actual costs of the approved conservation practices or 75 percent of the average cost of approved practices.

(c) TEN-YEAR AGREEMENT.—In the case of land enrolled in the healthy forests reserve program using a 10-year cost-share agreement, the Secretary of Agriculture shall pay the owner of the land an amount equal to not more than (as determined by the Secretary)—

(1) fifty percent of the actual costs of the approved conservation practices; or

(2) fifty percent of the average cost of approved practices.

(d) ACCEPTANCE OF CONTRIBUTIONS.—The Secretary of Agriculture may accept and use contributions of non-Federal funds to make payments under this section.

**SEC. 505. TECHNICAL ASSISTANCE.**

(a) IN GENERAL.—The Secretary of Agriculture shall provide landowners with technical assistance to assist the owners in complying with the terms of plans (as included in agreements or easements) under the healthy forests reserve program.

(b) TECHNICAL SERVICE PROVIDERS.—The Secretary of Agriculture may request the services of, and enter into cooperative agreements with, individuals or entities certified as technical service providers under section 1242 of the Food Security Act of 1985 (16 U.S.C. 3842), to assist the Secretary in providing technical assistance necessary to develop and implement the healthy forests reserve program.

**SEC. 506. PROTECTIONS AND MEASURES.**

(a) PROTECTIONS.—In the case of a landowner that enrolls land in the program and whose conservation activities result in a net conservation benefit for listed, candidate, or other species, the Secretary of Agriculture shall make available to the landowner safe harbor or similar assurances and protection under—

(1) section 7(b)(4) of the Endangered Species Act of 1973 (16 U.S.C. 1536(b)(4)); or

(2) section 10(a)(1) of that Act (16 U.S.C. 1539(a)(1)).

(b) MEASURES.—If protection under subsection (a) requires the taking of measures that are in addition to the measures covered by the applicable restoration plan agreed to under section 503, the cost of the additional measures, as well as the cost of any permit, shall be considered part of the restoration plan for purposes of financial assistance under section 504.

**SEC. 507. INVOLVEMENT BY OTHER AGENCIES AND ORGANIZATIONS.**

In carrying out this title, the Secretary of Agriculture may consult with—

(1) nonindustrial private forest landowners;
(2) other Federal agencies;
(3) State fish and wildlife agencies;
(4) State forestry agencies;
(5) State environmental quality agencies;
(6) other State conservation agencies; and
(7) nonprofit conservation organizations.

**SEC. 508. AUTHORIZATION OF APPROPRIATIONS.**

There are authorized to be appropriated to carry out this title—

(1) $25,000,000 for fiscal year 2004; and

(2) such sums as are necessary for each of fiscal years 2005 through 2008.

# TITLE VI—MISCELLANEOUS

**SEC. 601. FOREST STANDS INVENTORY AND MONITORING PROGRAM TO IMPROVE DETECTION OF AND RESPONSE TO ENVIRONMENTAL THREATS.**

(a) IN GENERAL.—The Secretary of Agriculture shall carry out a comprehensive program to inventory, monitor, characterize, assess, and identify forest stands (with emphasis on hardwood forest stands) and potential forest stands—

(1) in units of the National Forest System (other than those units created from the public domain); and

(2) on private forest land, with the consent of the owner of the land.

(b) ISSUES TO BE ADDRESSED.—In carrying out the program, the Secretary shall address issues including—

(1) early detection, identification, and assessment of environmental threats (including insect, disease, invasive species, fire, and weather-related risks and other episodic events);

(2) loss or degradation of forests;

(3) degradation of the quality forest stands caused by inadequate forest regeneration practices;

(4) quantification of carbon uptake rates; and

(5) management practices that focus on preventing further forest degradation.

(c) EARLY WARNING SYSTEM.—In carrying out the program, the Secretary shall develop a comprehensive early warning system for potential catastrophic environmental threats to forests to increase the likelihood that forest managers will be able to—

(1) isolate and treat a threat before the threat gets out of control; and

(2) prevent epidemics, such as the American chestnut blight in the first half of the twentieth century, that could be environmentally and economically devastating to forests.

(d) AUTHORIZATION OF APPROPRIATIONS.—There is authorized to be appropriated to carry out this section $5,000,000 for each of fiscal years 2004 through 2008.

*Speaker of the House of Representatives.*

*Vice President of the United States and*
*President of the Senate.*

# Appendix G

## Riverside County Mountain Communities
## Citizen Evacuation Guide

# Riverside County
# Mountain Communities
# Citizen Evacuation Guide

# Evacuating To Safety

A Wildfire Evacuation Guide for Residents and Visitors
of the Mountain Communities of Riverside County

**Riverside County**
**M**ountain **A**rea **S**afety **T**askforce

May 2005

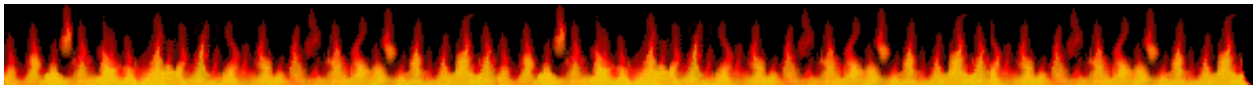
## Wildfire

California's 20 largest wildland fires have burned over 2.5 million acres, destroyed 13,710 structures and have killed 68 people. In October 2003, Southern California Wildfires alone burned 750,043 acres, destroyed 3,710 homes and killed 24 people including 1 firefighter.

## Local Conditions

Tree mortality in the San Bernardino National Forest of Riverside County (approx. 73,387 acres) has reached a fire risk of historical proportions. In March of 2002, the Riverside County Board of Supervisors declared a local state of emergency due to this risk and an ever-growing tree die off due to bark beetle infestation and a continued and persistent drought. Shortly thereafter, key stakeholders formed an interagency incident management group to respond to this emergency. This group, the Riverside County MAST (Mountain Area Safety Task Force), is concerned with mitigating the effects of this emergency, preparing for cascading events such as wildfire, pre-planning response strategies to secondary events such as evacuations and other emergencies and recovering from the effects of tree mortality and related emergencies.

**Even with all of the mitigation efforts underway, the risk of uncontrolled wildfire is at historical proportions.**



# Prepare Now!

# Evacuate Early!

# Evacuate Safely!

# What you can do

**Take personal responsibility for your own safety:**

1. **Develop an Evacuation Plan**
2. **Assemble an Evacuation Kit**
3. **Develop a Neighborhood Network**
4. **Practice your Evacuation Plan**
5. **Stay Informed**
6. **Evacuate when told to do so**

**Prepare Now!**

**Evacuate Early!**

## Evacuate Safely!

## 1. Develop an Evacuation Plan

Your Evacuation Plan should be simple enough to be followed when under stress, detailed enough to cover these key elements and understood by everyone.

✓ Identify your evacuation routes:
- At least two ways out of your neighborhood
- At least two ways off the mountain

*The evacuation routes determined by authorities will be dependent upon many factors including which way the wildfire is moving. Primary evacuation routes are included as a map attached to this guidance.*

Highway 243 towards Banning, Highway 74 towards Hemet, Highway 74 towards Palm Desert and Highway 371 towards Temecula have been identified as potential evacuation routes during wildfires.

✓ Identify when you will evacuate:

Typically you should evacuate when you:
- Become aware of an approaching wildfire
- Feel threatened
- When public safety officials advise you to leave the area

*Keep in mind that wildfires starting off the mountain in valley communities may quickly threaten the mountain communities*.

When time allows, evacuation orders will be provided by WNKI Radio 1610 AM, KATY Radio 101.3 FM, KFROG Radio 95.1 & 92.9 FM as well as by law enforcement public address systems.

Keep your car fuel tank at least ½ full at all times and be sure your vehicle is in good working order at all times.

✓ Identify shut-off valves for:
- Electricity – Leave electricity on to power well pumps and porch lights.
- Gas
- Water
- LPG or propane

✓ Identify a family meeting place

A family meeting place should be someplace that is:
- A temporary place to assemble before moving on to an evacuation center
- Safely outside of the evacuation area
- Doesn't interfere with emergency response activities
- Easily traveled to by family members

*Remember family members may be coming from different locations such as work, school, appointments, home or other locations. If unable to reach home, all family members must have a place to meet and re-group.*

✓ Identify Evacuation Center Locations

*Evacuation Center Locations will be determined by public safety officials and the American Red Cross at the time of the evacuation. Evacuation Center locations will be based upon the location of the wildfire, evacuation routes used and numbers of evacuees anticipated.*

Evacuation Centers used for wildfires typically include those located in Hemet, Banning, Palm Desert, Anza and Temecula. Center locations will be announced on public radio at the time of the fire or you may contact the Riverside County Fire Department - Fire Information Line at 951-940-6985 or the Riverside County Emergency Operations Center at 951-955-4700 during a fire emergency.

✓ Identify an Out of Area Emergency Contact

- Someone out of the telephone area code or out of State
- Available to receive calls and pass messages
- Everyone needs to know the contact's phone number
- Cordless phones will not work in a power outage, always maintain an older style plug in telephone

*During a major emergency or disaster, local telephone circuits may become over loaded whereas long distance circuits remain accessible. Identify a relative or friend who lives out of the area (out of the area code or even out of state) who can be used to check in with or pass messages back and forth to your immediate family members that may have gotten separated from you during the evacuation.*

✓ Special Considerations for Evacuations and Care of:

- Children and Infants
- Elderly
- Dependent Adults
- Persons with Special Needs such as medical and mental special care
- Pets, Livestock and Horses

*Special needs populations require special evacuation assistance. Special needs populations are those persons that cannot evacuate themselves without assistance. Don't rely on public safety agencies to evacuate you, your family or pets and livestock. Work with your neighbors to develop the assistance that you or they may need during an evacuation. Identify those living alone or those needing special assistance and plan today how you will evacuate them during an emergency.*

## 2. Develop an Evacuation Kit

*An evacuation kit should be readily available and visible at all times, updated frequently and located near the front door of your house or in your car.*


Items to include in your Evacuation Kit include:

- Copy of your Evacuation Plan
- Evacuation map and local area map
- Important family documents and telephone numbers
- Prescription medicines and eyeglasses
- First Aid kit
- At least one change of clothing, pillow and blankets
- Flashlight with extra batteries
- Hygiene supplies
- Entertainment material for all family members
- Food and water for all family members
- Cash and coin for emergency purchases
- Extra set of car keys
- Special items for infant, children, elderly or those with special needs
- Safety glasses or goggles, and bandana for blowing wind and fire embers
- Emergency tools including work gloves, sturdy shoes, and battery operated radio
- Essential valuables
- Cell phone and charger

## 3. Develop a Neighborhood Network

- ✓ Work with neighbors to identify:
  - people with special needs
  - people who need transportation to the evacuation center
- ✓ Work with neighbors to coordinate the evacuation of pets, livestock and horses.
- ✓ Work with neighbors to identify utilities that may require shutting down in your absence.
- ✓ Work with neighbors to identify those protective actions that are required around your home when wildfire approaches.
- ✓ Work with neighbors to develop a neighborhood communication plan, which includes a telephone notification tree to notify others in case of emergency or evacuation.

*You may not always be at home during times of wildfire. You need your neighbors to help protect your family, pets, livestock and house in your absence!*

## 4. Practice your Evacuation Plan

- ✓ Quiz your children periodically so they remember what to do in case of wildfire.
- ✓ Conduct regular fire and emergency drills.
- ✓ Drive evacuation routes so you remain familiar with emergency travel routes and road conditions.
- ✓ Maintain your evacuation kit with fresh batteries, food, water and important family documents.
- ✓ Be sure that all visitors and guests know and understand your evacuation plan and evacuation routes.

*Practice, practice and practice. Repetition breeds the automatic response you will need when having to act under stress during emergencies.*

## 5. Stay Informed

- ✓ Stay Informed on current Weather and Fire Threat.

National Weather Service San Diego
Riverside County Forecasts
Telephone: (858) 675-8700 - follow the prompts
Web Link: http://www.wrh.noaa.gov/sgx/

United States Forest Service
Regional Fire Weather Forecasts
Web Link: http://www.fs.fed.us/r5/fire/intel/index.html

- ✓ Stay Informed on current status of the Drought and Bark Beetle Tree Mortality Emergency.

Mountain Area Safety Taskforce (MAST)
Public Information Center
Web Link: http://calmast.org/mast/public/index.html

California Department of Forestry and Fire Protection (CDF)
Southern California Bark Beetle Emergency
Web Link:
http://www.fire.ca.gov/ResourceManagement/so_cal_beetle_infest.asp

✓ Stay Informed on current emergency plans and preparations.

Idyllwild Fire Protection District
(951) 659-2153 for business

Riverside County Fire Department/CDF
Station 23 Pine Cove (951) 659-2732 for business
Office of Emergency Services (951) 955-4700 for business

United States Forest Service
San Jacinto District – Idyllwild (909) 382-2921 for business

**Dial 9-1-1 for Emergencies**

## 6. Evacuate when told to do so

*Evacuate immediately if told to do so! Evacuate when you become aware of an approaching wildfire. Evacuate if you feel threatened. Evacuate before it becomes too late!*

- Listen to your car radio or battery-powered radio and follow the instructions of local emergency officials.
- Park your vehicle facing outward and place your keys in the ignition.
- Locate all family members and pets to prepare for evacuation.
- Prepare livestock and horses for transportation.
- Wear protective clothing and sturdy shoes. Wear 100% cotton clothing to include long sleeve shirt, long pants and hat. Have goggles available in case of winds or flying fire embers and a dry bandana or handkerchief to cover your mouth and nose.
- Place your evacuation kit in your car.
- Place a ladder outside for roof access for firefighters.
- Place a connected garden hose and buckets full of water around the outside of the house.
- Assemble firefighting tools near the house, including: shovel, rake, hoe, etc.
- Move propane BBQ appliances away from structures.
- Remove all combustible material such as lawn and patio furniture, doormats and decorations from around the perimeter of your house.
- Remove combustible window furnishings from around all windows.
- Leave lights on in the house and doors unlocked.
- Leave windows closed and heating/air conditioning off.

# The Evacuation Process

**Officials will determine the areas to be evacuated and the routes to use depending upon the fire's location, fire behavior, wind, terrain, etc.**

- Law enforcement agencies are typically responsible for enforcing an evacuation order. Follow their directions promptly and exactly!
- You will be advised of potential evacuations as early as possible. You must take the initiative to stay informed and aware.
- Listen to your radio/TV and for announcements from law enforcement and emergency personnel.
- You may be directed to a temporary assembly area off the mountain to await transfer to an evacuation center.
- When heavy smoke reduces visibility, movement may be restricted only to escorted convoys.
- Always drive cautiously!

## Returning Home

**Officials will determine when it is safe for you to return to your home. This will be done as soon as possible with primary consideration given safety and accessibility.**

- Local officials will follow a Re-Entry Plan in working towards getting you back into your neighborhood.
- This will typically take place when it is safe for you, safe for emergency personnel, safe for utility workers and routes are open and accessible.
- Prior to re-entry utilities will need to be repaired and in service, sewer and sanitation will need to be repaired, running water will need to be available and essential services will need to be available such as gas, medical services and food.

  These things take time. **BE PATIENT**. The safety of you and the safety of emergency service personnel are the priority.
- When you do return home:
  - Be alert for downed power lines and other hazards.
  - Check propane tanks, regulators, and lines before turning gas on.
  - Check your residence carefully for hidden embers or smoldering fires.
  - Contact your insurance company if you have suffered loss or damage.

# When Wildfire Approaches

- **Park vehicles facing out with windows rolled up and keys in the ignition.**
- **Place your evacuation kit and important valuables in your vehicle.**
- **Prepare children and elderly family members for evacuation.**
- **Secure pets and livestock and prepare them for evacuation.**
- **Close shutters, windows, fireplace dampers and turn off heating and air conditioning.**
- **Remove combustible window coverings from windows.**
- **Remove any last minute combustible items such as lawn furniture, newspapers or doormats away from your home.**
- **Leave electricity on and leave inside lights on.**
- **Leave exterior porch lights on.**
- **Place a garden hose and buckets full of water around your house.**
- **Place aluminum ground ladders outside your house for firefighting use.**
- **Cover up by wearing 100% cotton long pants, long sleeved shirt, goggles, hat and bandana for your face.**
- **Notify your out of area contact of your intended evacuation destination.**
- **Leave a note attached to your front door for neighbors and public safety officials advising of your evacuation destination and telephone number if available.**
- **Evacuate when wildfire approaches, you feel threatened, or directed by public safety officials.**

# If You Become Trapped

**While in your vehicle:**
- Stay Calm.
- Park your vehicle in an area clear of vegetation.
- Close all vehicle windows and vents.
- Turn air conditioning to “max” mode, or “re-circulate”.
- Cover yourself with wool or 100% cotton blanket or jacket.
- Lie on vehicle floor.
- Keep your vehicle running with headlights on.
- Use your cell phone to call 9-1-1 and notify officials of your situation and location.

**While on foot:**
- Stay calm.
- Go to an area clear of vegetation, a ditch or depression if possible.
- Lie face down.
- Cover mouth and nose and cover up your body with cotton clothing or a large cotton coat or blanket.
- Use your cell phone to call 9-1-1 and notify officials of your situation and location.

**While at home:**
- Stay calm.
- Keep your family together.
- Call 9-1-1 to notify officials of your situation and location.
- Fill sinks and tubs with cold water.
- Keep doors and windows closed, but unlocked.
- Stay inside your house.
- Stay away from outside walls and windows.
- If your house catches fire, move to the far end of the house and close windows and inside doors to restrict the spread of the fire. When it is safe to do so, exit your house and move to a “blackened” area of your property or neighborhood that has already burned. It is safer to be in an area that has already burned than an area not yet burned.

*It will get hot in the house, but this is much safer than being outside and exposed to flames and dangerous fire gases.*

**After the fire passes:**
- Check your family and neighbors.
- Check roof and exterior of house for fire.
- Check under decks and inside attic for fire.
- Check your yard for burning trees, woodpiles (between pieces of firewood), etc.
- Extinguish embers and sparks.
- Continue to check for fires, embers and sparks for at least 12 to 24 hours after the fire has passed.

# MY EVACUATION PLAN

**Evacuation Routes out of my neighborhood**

Primary:

_____

Alternate:

_____

**Evacuation Routes off the mountain**

If wildfire approaches from the North:

_____

If wildfire approaches from the South:

_____

If wildfire approaches from the East:

_____

If wildfire approaches from the West:

_____

**Designated Family Meeting Place** (outside evacuation area)

1. _____
2. _____

**Evacuation Tasks** (identify family member assigned to each task)

Ready exterior of house for evacuation
(combustibles, propane, hose, water, ladders)

_____

Ready interior of house for evacuation
(windows, window furnishings, air conditioning)

_____

Ready vehicle for evacuation

_____

Ready evacuation kit and important valuables

_____

Ready pets and livestock for evacuation

_____

Ready children and elderly members for evacuation

_____

Leave note for neighbors and public safety officials

_____

# IMPORTANT PHONE NUMBERS

## Emergency 9-1-1

**Out of Area Emergency Contact**

Name: _____
Phone: _____
Name: _____
Phone _____

**Neighborhood Contact for Evacuation Assistance**

Name: _____
Phone: _____
Name: _____
Phone: _____

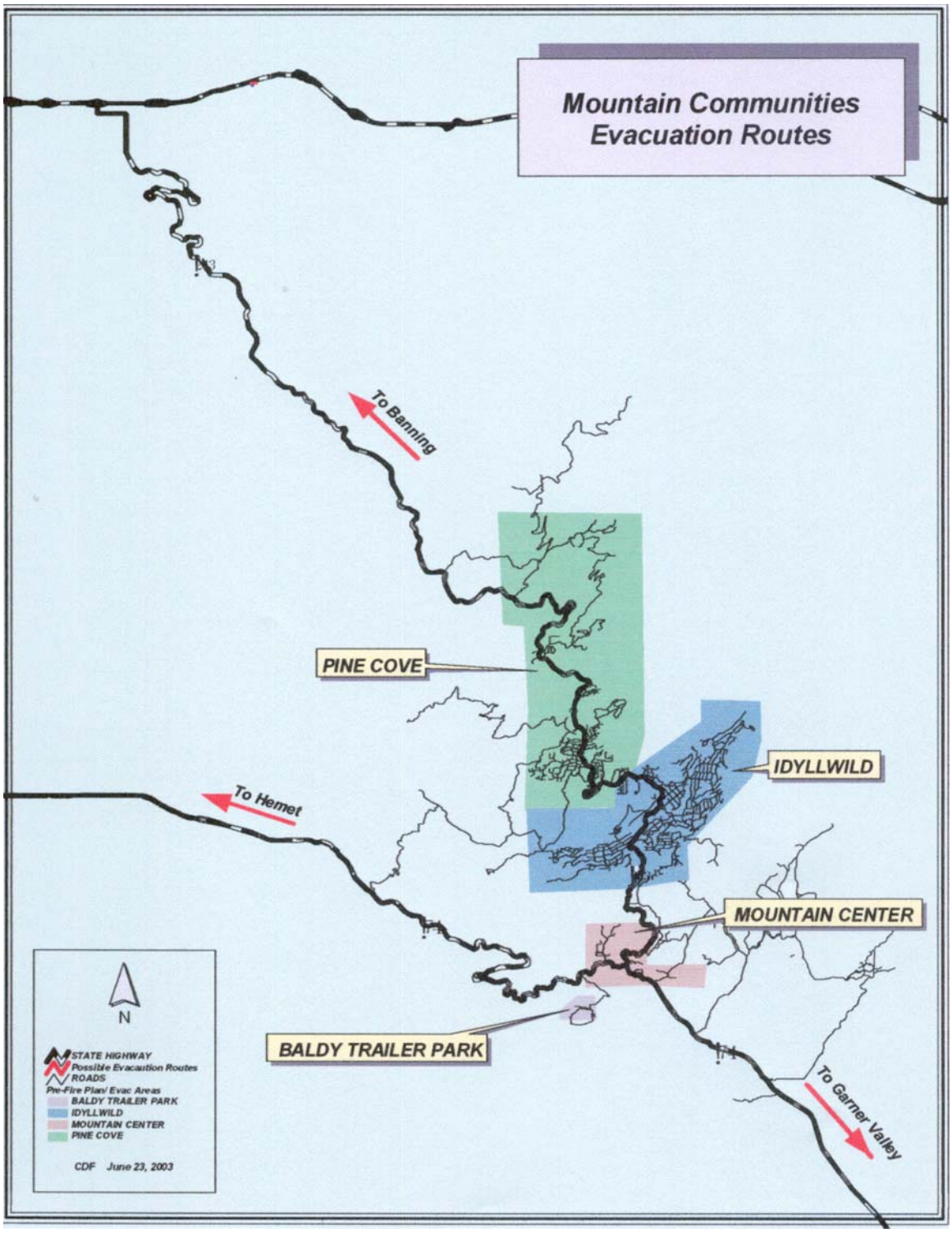
**Children's Schools & Childcare**

Name: _____
Phone: _____
Address: _____
Name: _____
Phone: _____
Address: _____

**Veterinary & Animal Boarding Services**

Name: _____
Phone: _____
Address: _____
Name: _____
Phone: _____
Address: _____

| | |
|---|---|
| **Riverside County Fire Information** | 951.940.6985 |
| **United States Forest Service** | 951.659.2117 |
| **Idyllwild Fire Protection District** | 951.659.2153 |
| **Riverside County Sheriff - Hemet** | 951.791.3400 |
| **Riverside Co. Emergency Ops. Center** | 951.955.4700 |
| **Riverside County Animal Services** | 951.358.7387 |
| **American Red Cross - Temecula** | 951.676.3711 |


Mountain Communities
Evacuation Routes
To Banning
PINE COVE
IDYLLWILD
To Hemet
MOUNTAIN CENTER
BALDY TRAILER PARK
To Garner Valley
N
STATE HIGHWAY
Possible Evacuation Routes
ROADS
Pre-Fire Plan/ Evac Areas
BALDY TRAILER PARK
IDYLLWILD
MOUNTAIN CENTER
PINE COVE
CDF June 23, 2003

Riverside County Mountain Communities
Citizen Evacuation Guide

Riverside County MAST
c/o
Riverside County Fire Department
Office of Emergency Services
951.955.4700
anthony.coletta@fire.ca.gov


Last revised: 07/19/05

# Appendix H

## Fire Threat Methodology

# Characterizing the Fire Threat to Wildland–Urban Interface Areas in California

## *Introduction*

This document outlines the procedures used to identify areas in California that pose significant threats from wildfire to the people of California. It was prepared under the auspices of the California Fire Alliance -- a coalition of representatives from State and Federal Fire Agencies, originally formed in 1996, who have collaborated on integrating fire management and planning across jurisdictional boundaries. While much of the basic premise and data the development of this analysis has a beginning in the California Department of Forestry and Fire Protection's California Fire Plan, this work represents new and original work that is sanctioned by the USDA Forest Service, the USDI Bureau of Land Management and National Park Service, in addition to CDF. The Fire Alliance views the issue of the wildland interface as natural area for collaboration, and is optimistic that the following analysis can be a model for other areas. The analysis was prepared in response to a mandate from Congress in the 2000-2001 Interior appropriations bill establishing the National Fire Plan.

Utilizing a Geographic Information System (GIS) approach that is at the heart of the California Fire Plan, the three main components in the assessment of threat from wildland fire to Wildland-Urban Interface areas of California are:

- Ranking fuel hazard
- Assessing the probability of wildland fire
- Defining areas of suitable housing density that lead to Wildland-Urban Interface fire protection strategy situations
-

These three independent components were then combined using GIS capabilities to identify wildland interface areas threatened by wildfire. In addition to mapping these areas, a list of communities was developed that summarized a non-spatial assessment of key areas within the vicinity of significant threat from wildland fire. A subset of that list was made that includes those communities that have a significant fire threat from nearby Federal lands. A buffer distance of 1.5 miles was used in the analysis to define "nearby" federal lands.

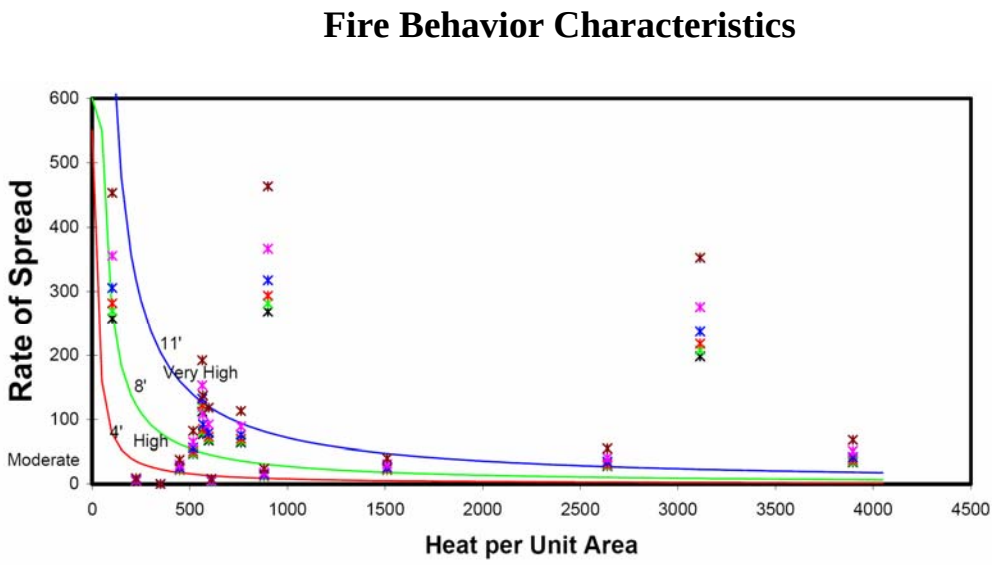
*Methods*

## 1. Defining Fuel Hazard

The California Department of Forestry and Fire Protection's Fire and Resource Assessment Program staff built a methodology of assigning fire hazard across diverse landscapes of California as part of California's Fire Plan. The first step in the hazard assessment process is development of a vegetation map based on the best available, most recent and detailed vegetation composition and structure information. These vegetation maps were then translated (using a crosswalk process similar to that used in the Sierra Nevada Ecosystem Project but specific to each local area) to Fire Behavior Prediction System (FBPS) fuel models. Recent large fires are mapped and used to change the base map to better reflect current wildland fuel conditions. A forest growth model is included to account for new vegetation growth since the last wildfire. The California Interagency Fuel Mapping Group guided this assessment and resolved mapping differences at jurisdictional boundaries, producing a seamless map of fuel characteristics across all ownerships and protection jurisdictions. That is, local representatives of Federal, State and local fire agencies have contributed to the development of the statewide fuels data.

The next step in this assessment is to convert the fuels map to a fire hazard map. Potential fire behavior drives the hazard ranking with fire hazard defined as the fire behavior potential of the wildland fuel, given average bad fire weather conditions. Fire behavior is calculated using the Fire Behavior Prediction System equations and then summarized into moderate, high, or very high classes. The method first calculates the expected fire behavior for unique combinations of slope and fuels under average bad fire weather conditions. Figure 1 portrays the rate of spread and heat flux of the fuel-byslope-class combinations on top of three fireline intensity iso-curves that divide the space into hazard rank subspaces. Thus, each fuel-by-slope-class =combination receives a surface hazard rank according to its location within Figure 1.

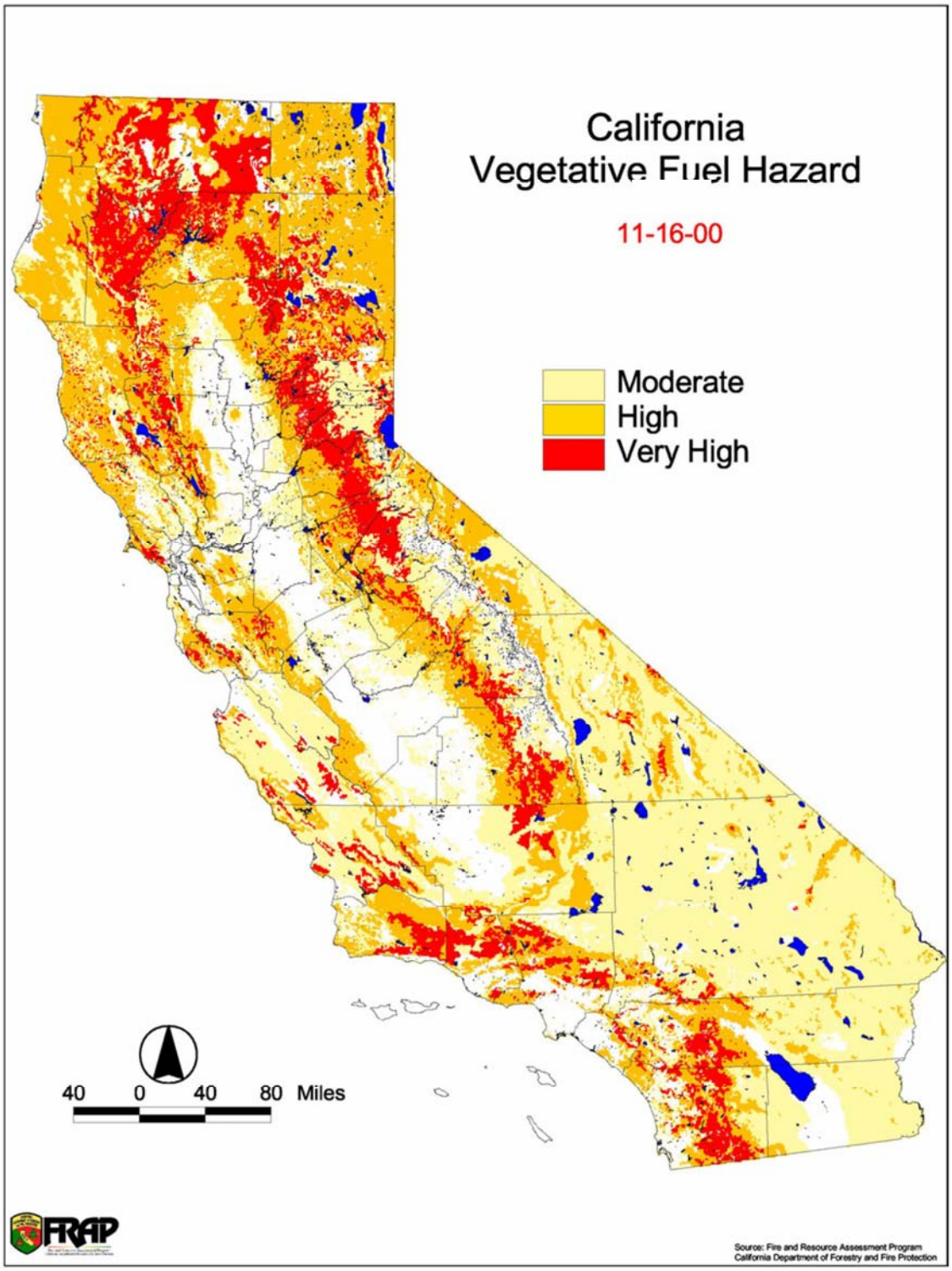
**Figure 1. Fire behavior characteristics chart of fuel models by NFDRS slope classes.**




In this graph, each column of "x" s represents the fire behavior characteristics of a fuel type burning on increasingly steep slopes. The area above and to the right of the blue line indicates fire behavior with flame lengths greater than 11 feet in the surface fuels. The area between the green line and the blue line indicates fire behavior with flame length potential between 8 feet and 11 feet. The red line is the 4-foot flame length line. Surface hazard is moderate for fuel types in the 0 – 4 foot flame length area, high for the 4 – 8 foot flame length area and very high for fuels with greater than 8 foot flame length potential.

The Fire Plan process uses a grid system for data analysis. Staff formed the grid by partitioning each 7.5" USGS quadrangle sheet into 81 (9-by-9) miniquads. Each grid cell is approximately 450 acres. This method allows more complex data to be summarized and presented in a consistent mapping process. A surface fire hazard map is made by assigning a hazard ranking to each grid cell based on its slope class and fuel model. The final fire hazard includes an assessment of 2 additional factors that lead to severe fire behavior (ladder and crown fuels). Figure 2 shows the spatial allocation of fuel hazards across California as developed through this methodology.

**Figure 2 shows the spatial allocation of fuel hazards across California**



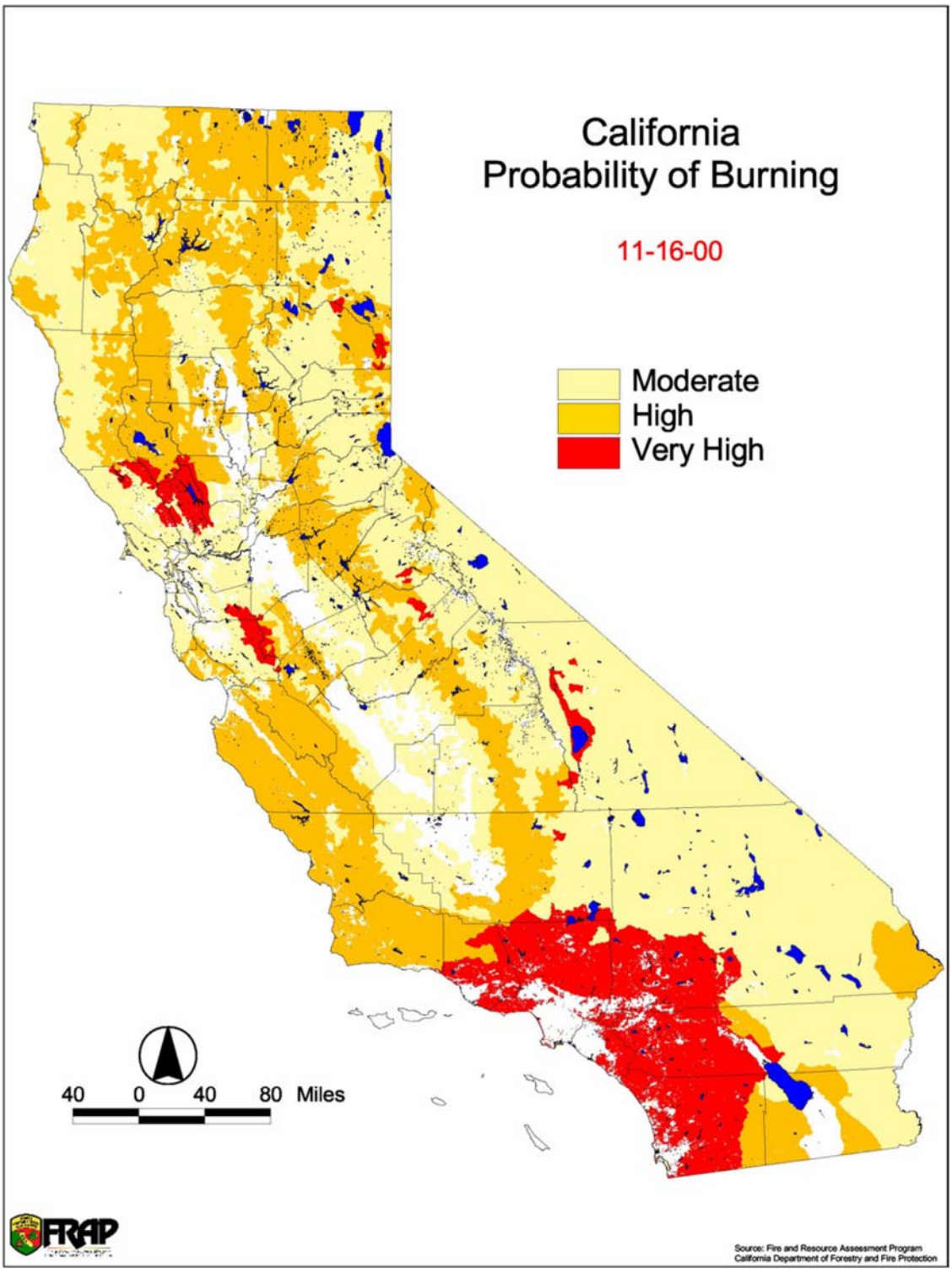
## 2. Probability of Burning

The probability of a fire burning in a given location is based on a milieu of factors including vegetative fuel condition, weather, ignition source, fire suppression response, and more. The Fire and Resource Assessment Program staff has analyzed 47 years of fire history from 1950 – 1997 with respect to vegetation type, bio-region, and owner class to produce a 3 class ranking of the probability of a costly damaging fire (PFIRE). The method used to determine PFIRE was similar to the calculation of fire rotation used in analyzing fire regimes. Fire perimeter data (from all of the wildland fire protection agencies) was overlaid on the vegetation type map to determine how many acres burned in each vegetation type during the entire period of record. These values were then divided by the total area in that particular vegetation type multiplied by the number of years of fire perimeter data in the record. The calculated probability values are then grouped into the following three classes:

- Very High (probability of a fire is 1% per year or greater)
- High (probability of a fire is 0.33% - 1% per year)
- Moderate (probability of a fire is less than 0.33% per year)

These values are equivalent to fire frequencies of less than 100 years, 100-300 years, and greater than 300 years, respectively. The resultant figure represents the annual likelihood that a large damaging wildfire would occur in that particular vegetation type. The analysis is summarized by watershed and ranked based on the highest PFIRE identified through this analysis. Figure 3 shows the distribution of PFIRE within California.

**Figure 3 identifies the probability of a given piece of ground burning**



**4. Assessing Fire Threat**

Staff calculated a numerical index of fire threat based on the combination of hazard rank and fire probability. A 1 – 3 ranking from PFIRE (probability of a damaging fire occurring) was summed with the 1 – 3 ranking from the fuel hazard component to develop a threat index ranging from 2 to 6. This threat index is then grouped into three threat classes. Scores from four to six received a high threat rank; a score of three received a moderate threat rank; and a score of two received a low threat rank (Table 1). Areas that did not support wildland fuels (e.g., open water, agriculture lands, etc.,) were omitted from the calculation of fire threat (Figure 4). Additionally, areas of very large urban centers (i.e., "concrete jungles") were also removed from the final analysis by combining the fire threat coverage with the urban-interface coverage.

**Table 1. Fire threat matrix based on hazard rank and fire probability.**

| | **Hazard Rank** | | |
|---|---|---|---|
| **PFIRE** | **1 (Moderate)** | **2 (High)** | **3 (Very High)** |
| **1 (Moderate)** | 2 (Low) | 3 (Moderate) | 4 (High) |
| **2 (High)** | 3 (Moderate) | 4 (High) | 5 (High) |
| **3 (Very High)** | 4 (High) | 5 (High) | 6 (High) |

**1) Figure 4 shows California's Fire Threat Zones**