Big Bear Valley Community Wildfire Protection Plan

Final Plan
"A Systems approach"
June, 2006

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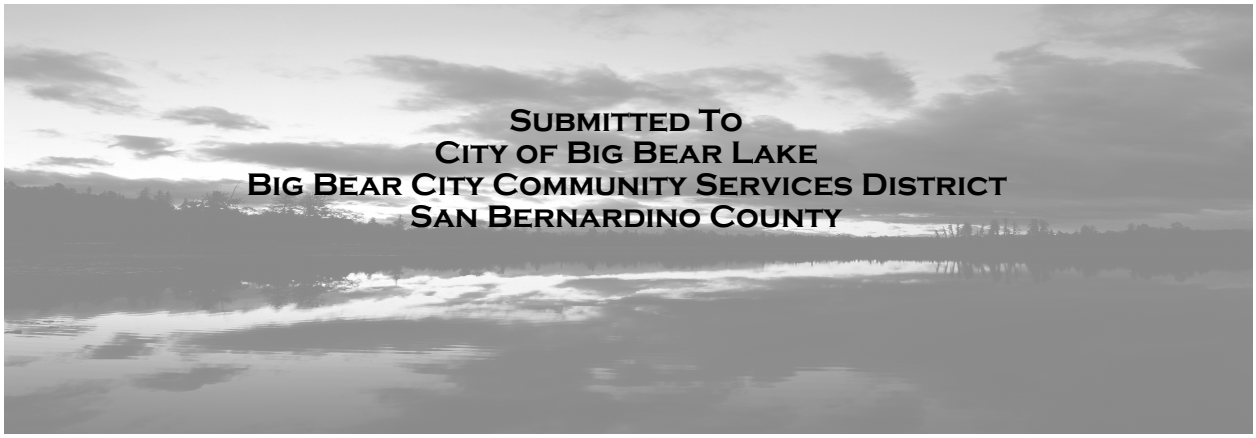

Submitted To
City of Big Bear Lake
Big Bear City Community Services District
San Bernardino County

Special Acknowledgement

to the

United States Forest Service,
San Bernardino National Forest,
Mountain Top Ranger District

and the

California Department of Forestry,
San Bernardino Ranger Unit

for Providing Supportive Maps, Statistics,
Reports, Information, and Data
Necessary to Accomplish the
Big Bear Valley Community Wildfire Protection Plan

Plan Adoption

The Community Wildfire Protection Plan:

- Was collaboratively developed. Interested parties and federal land management agencies managing land in the vicinity of the Big Bear Valley have been consulted.
- This plan identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment that will protect the Big Bear Valley.
- This plan recommends measures to reduce the ignitability of structures throughout the area addressed by the plan.

The following entities mutually agree with the contents of this Community Wildfire Protection Plan:

_____

Mayor, City of Big Bear Lake

_____

Fire Chief, Big Bear Lake Fire Protection District

_____

Representative, California Department of Forestry and Fire Protection

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_____

Chairman, San Bernardino County Board of Supervisors

_____

Fire Chief, San Bernardino County Fire Department

_____

Representative, California Department of Forestry and Fire Protection

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Section 1.0 Executive Summary

The Big Bear Valley Community Wildfire Protection Plan (BBVCWPP) discusses both public and private concerns. Successful wildfire protection planning involves a review of all protection measures that contribute to a collective "systems approach" process. Eliminating the risk or threat is not always possible when living in a forest. What is possible is minimizing the threat by reducing structure ignitability, developing defensible space, and conducting fuels treatment that reduce the intensity and severity of a wildland fire.

The driving force in developing the BBVCWPP was the Healthy Forest Initiative, the Old & Grand Prix Fires, other historic fires (Bear, Panorama, and Willow), and the ongoing mortality rate of trees within the San Bernardino National Forest. Three broad categories that are discussed in this Plan are (1) the need for fuel breaks and treatments around and within the communities of the Big Bear Valley and in the forest itself; (2) the degree to which enforcement and voluntary participation contributes to the protection scheme; and (3) the willingness to develop and implement retrospective and prospective strategies to reduce the structural ignitability of properties within the Wildland Urban Interface (WUI).

Section 1.1 Plan Process

This Plan was developed after review and evaluation of the National Fire Plan, California Fire Plan template (August 2004 version), South Big Bear Fuels Reduction Project, San Bernardino County Operational Area Plan, and other available relevant documents.

Although this Plan is a public document for Homeland Security issues, certain maps that specifically provide information that may be sensitive in nature are not included. They include fire regime maps, condition class, fire history, utility maps, and critical infrastructure maps. At this time, the writers of this document have chosen not to identify and discuss items considered to be of a sensitive nature in accordance with Homeland Security guidelines.

Section 1.2 Introduction

The Big Bear Valley is nestled in the San Bernardino National Forest. The Valley is one of the only premiere four season mountain resort communities in Southern California. This Valley supports year round activities for snow skiing, fishing, boating, hiking, hunting, off-roading, mountain biking, and just relaxing & enjoying the forest environment. It is home to small boutique shops, eateries, small entertainment businesses, light manufacturing, and commercial industries that support tourism. In 2004, approximately 6 million people visited the Big Bear Valley.

Unknown to most visitors is the fact that the City of Big Bear Lake and the unincorporated Big Bear City Community Services District are listed in the Federal Registry as communities at high risk to wildland fires. Making fire even more of a threat is the ongoing and continual tree death rate within the WUI. A combination of issues has contributed to the alarming

increase in the death rate of various trees within the San Bernardino National Forest. The purpose of this document is to address these issues and propose measures that can reduce the threat of fire to our communities, simultaneously restoring the health of our forest.

Southern California has had drought-like conditions. This is a recurrent event and similar droughts have occurred in the past 100 years, and yet the tree mortality has never occurred to this extent. In some areas of Lake Arrowhead, nearly 90% of all conifer trees have died. In the San Bernardino National Forest, it is estimated that nearly 13 million trees have died. It has actually been said, "we have loved our forests to death."

Secondly, the watershed from years of drought conditions and depletion of the upper ground water aquifers has reduced the available water used by both vegetation and domestic sources.

During the last century after human occupation, fires in the Big Bear Valley have been small in nature. After the turn of the twentieth century and from the earliest date of Forest Service records, the Big Bear Valley has been absent any large or catastrophic fire.

Development in the Valley has caused the elimination of some existing trees, shrubs, and other plants, but it has done little to curtail the catastrophic fire hazard potential in the Valley. It can even be said that development has added fuel to the fire. In fact, it could be argued recent fire modeling of the Big Bear Valley indicates to a high degree that burnable fuel loading, topography, and cyclical climatic conditions cause Big Bear Valley to be susceptible to a large and/or catastrophic fire.

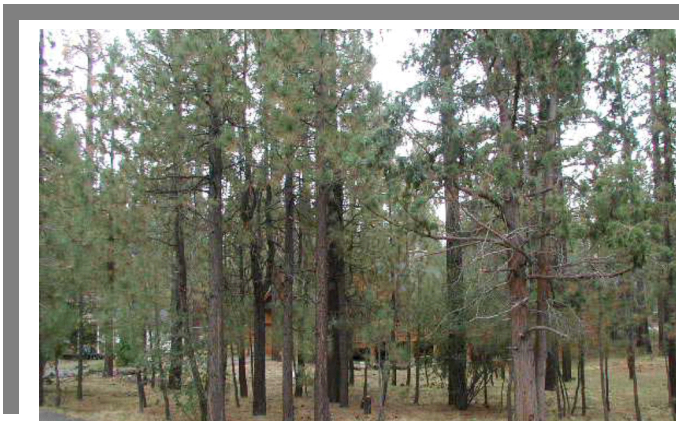
In spite of this very high fire hazard potential rating over the past decades, our fire suppression efforts have been successful at minimizing property damage as well as large vegetation fires in and around the Big Bear Valley. Yet the susceptibility to a large fire has not diminished. For the most part, little can be done to change the topographical and climatic conditions of the Big Bear Valley leaving one of the only changeable features, that being fuel loading.

Prior to Valley development, the Forest Service notes that area fires were more frequent and less intense. This was during an era where fires started by Native Americans and/or lightning caused fires removed the natural accumulation of burnable fuels such as pine needles, twigs, brush, saplings, branches, snags, and down dead trees and were left to burn out naturally leaving a mosaic pattern of fuel density across the landscape of the National Forest.

Over the years, logging of trees helped to reduce the fuel density found in the forest. This practice has been eliminated as a current use of the forest as it transitioned to a tourism and urbanized relief setting, except for the reduction of trees for firewood or small thinning projects. Even the harvesting of Christmas trees by permit is forbidden. This is an indication of the times where environmental sensitivity and preservation of most trees was seen as a normal course of action on both private and public lands but did little to curb fuel loading in our communities and in the forest.

The heightened awareness from a series of catastrophic fires, the rise of beetle infestation, disease, and drought led to experts rethinking past policies and to prescribe treatments to create and sustain forest health as well as provide fuel breaks that would reduce the threat to communities which are at risk.

The hands off approach to harvesting/thinning trees combined with quick suppression efforts and cyclical climatology has combined to exacerbate the declining health of the forest.



This has only increased the probability that a catastrophic fire would occur consuming large areas currently populated by all sizes and types of trees and vegetation. Harvesting/thinning selected trees and brush in forest areas that are densely overpopulated to help reduce the wildfire threat and to create a more bio-diverse ecosystem is necessary. It must be recognized that fuel loading is at its all time high on both private and public lands. The understory of manzanita, ironwood, and scrub oak height range up to 3 to 18 feet with a dense co-mingled canopy that makes it difficult to walk through. Increasingly, the number of dead pine and fir trees is noticeable in the forest in contrast to having one of the wettest years on record.

The tree mortality rate is relatively indiscriminate of age and size. Some of the largest and oldest trees in the San Bernardino National Forest exist within the Big Bear Valley. One of the largest lodge pole pine trees in the United States is located in the forest just south of Big Bear Lake. Large Jeffery pine and white fir series are 250 to 350 years old. Measures to protect and preserve these trees may be necessary, i.e., removing other trees and brush in and around these trees and potentially spraying the trees on an ongoing basis to protect them from beetle infestation.

During the Old Fire in 2003, this conflagration reached a triggering point that forced the evacuation of the communities of the Big Bear Valley for a period of three days. The social and economic effect that resulted has made it difficult for some in the business community to survive. More importantly, there is a feeling of complacency that has set in. People s perception is that the evacuation was unwarranted. Citizens have been heard to say *The next time, I am not going to evacuate.* These attitudes and the high fuel loading combine to set the stage for a potential disaster that could occur the next time a large fire occurs. Public education measures must be taken to inform the community on construction standards, defensible space practices, forest health issues, the need for forest thinning, fuel loading, hazard analysis, protection of old growth trees, the importance of protecting the watershed, and to actively educate the community on the reintroduction of prescriptive and controlled fires into the Big Bear ecosystem on both public and private lands.

It is, therefore, essential to effect a community fire protection plan that addresses the following issues.

Section 1.3 Overall Goals

General Goals

- Ensure the long-term economic stability of the communities by reducing the fire threat risk from very high to moderate/low.
- Identify lands private, public, forested, urbanized or otherwise that, if treated, would reduce the potential fire impact to communities and structures in and around the Big Bear Valley. This is commonly referred to as the Wildland Urban Interface (WUI) zone.
- Implement fuel reduction measures to assure continuing and ongoing safety of the Big Bear Valley watershed and recharge aquifers.
- Identify high valued areas that, if absent from trees, would have a detrimental effect on the appearance and ambiance of the communities of the Big Bear Valley. Propose and implement measures to assure the long-term survivability of these trees.
- Identify and support new markets that collectively, with public and private partnerships, assure that the forest vegetation and trees that are removed go to sources that have a beneficial use, i.e., lumber, biomass chips for landscaping, erosion control, and/or energy.
- Enhance biodiversity and forest health.

Buildings

- Review, evaluate, and modify fire wise building codes and fire protection laws for private landowners/builders to reduce home ignitions.
- Review, evaluate, and make recommendation for a fuel reduction and vegetation management/landscape ordinance.
- Design and develop a list of building standards that existing homeowners can voluntarily install to reduce the vulnerability of their homes.

Public Education

- Provide education to property owners about the need for fire wise construction standards, laws, and codes.
- Through public education and enforcement efforts, maintain ongoing practices of assuring the removal of overgrown vegetation and fuel loading on private lands. Emphasize defensible space clearing on private lands within the Big Bear Valley.
- Monitor, report, and educate citizenry on changes in the biodiversity evidenced within the Big Bear Valley Wildland Urban Interface (WUI).
- Seek as needed assistance from the Natural Resource Conservation Service on monitoring and implementing ways to educate citizenry on methods and techniques to help reduce soil erosion.
- Educate the public on public land fuel treatments, which will reduce local fire risk and improve forest health conditions.

Healthy Forest goals

- Develop and prioritize fuel treatment programs on National Forest lands using Forest Service practices within the Big Bear Valley WUI. For fuel treatment prescriptions on private lands, individuals are required to follow Title 14, State Forest Practice Act.
- Implement treatments within the Big Bear Valley WUI to revitalize forest health. Treatments should promote a mixed age class stand with healthy stocking levels that supports multiple forest resource values such as forest products, esthetics, water, wildlife, recreation, etc.
- Support the reintroduction of prescriptive and controlled fires into the ecosystem of the Big Bear Valley WUI on both public and private lands.
- Incorporate as much as possible a "do more with less" concept by privatizing "off budget" management and treatment prescriptions of the forest.

Section 1.4 Priorities Projects Summary

See Matrix 6.6, Page 43 for CWPP Project Summary.

Section 1.5 Acknowledgements

The Big Bear Valley Community Wildfire Protection Plan recognizes the indefatigable efforts of several individuals of the Big Bear Valley that without their participation and persistent encouragement this Plan would not have been completed.

David Jones, Big Bear Valley Fire Safe Council
Denise Proffer, Big Bear Valley Fire Safe Council
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Kathy Sawyer, Big Bear Valley Fire Safe Council
Laura Dyberg, Mountain Rim Fire Safe Council
Local Fire Agencies:
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Dana Van Leuven, Fire Chief, Big Bear City Fire Department
Jeff Willis, Assistant Fire Chief, Big Bear City Fire Department
George Corley, Division Chief, San Bernardino County Fire Department
Randy Clauson, Division Chief, United States Forest Service
Beth Nabors, Battalion Chief, United States Forest Service
David A. Yegge Forestry Fuel Technician, City of Big Bear Lake

Section 2.0 Mission Statement

The Big Bear Valley Community Wildfire Protection Plan provides a system-wide approach that reduces the fire hazard potential, enhances bio-diversity, promotes economic stability, is

SAFETY ORIENTATED, ENVIRONMENTALLY SENSITIVE, AND FOCUSES ON CREATING A BENEFICIAL USE OF THE BIOMASS FOR THE GREATEST GOOD.

Section 2.1 Methodology, Process, and Plan Development

The Big Bear Valley Community Wildfire Protection Plan group consists of private citizens involved through the Big Bear Valley Fire Safe Council and representatives from public fire protection agencies that are interested in developing a plan that enhances the protection of the communities, citizenry, infrastructure, historical, and cultural sites as well as assuring a bio-diverse healthy forest through conducting continual and ongoing fuel treatment projects on public and private lands to allow a more healthy sustainable density for generations to come.

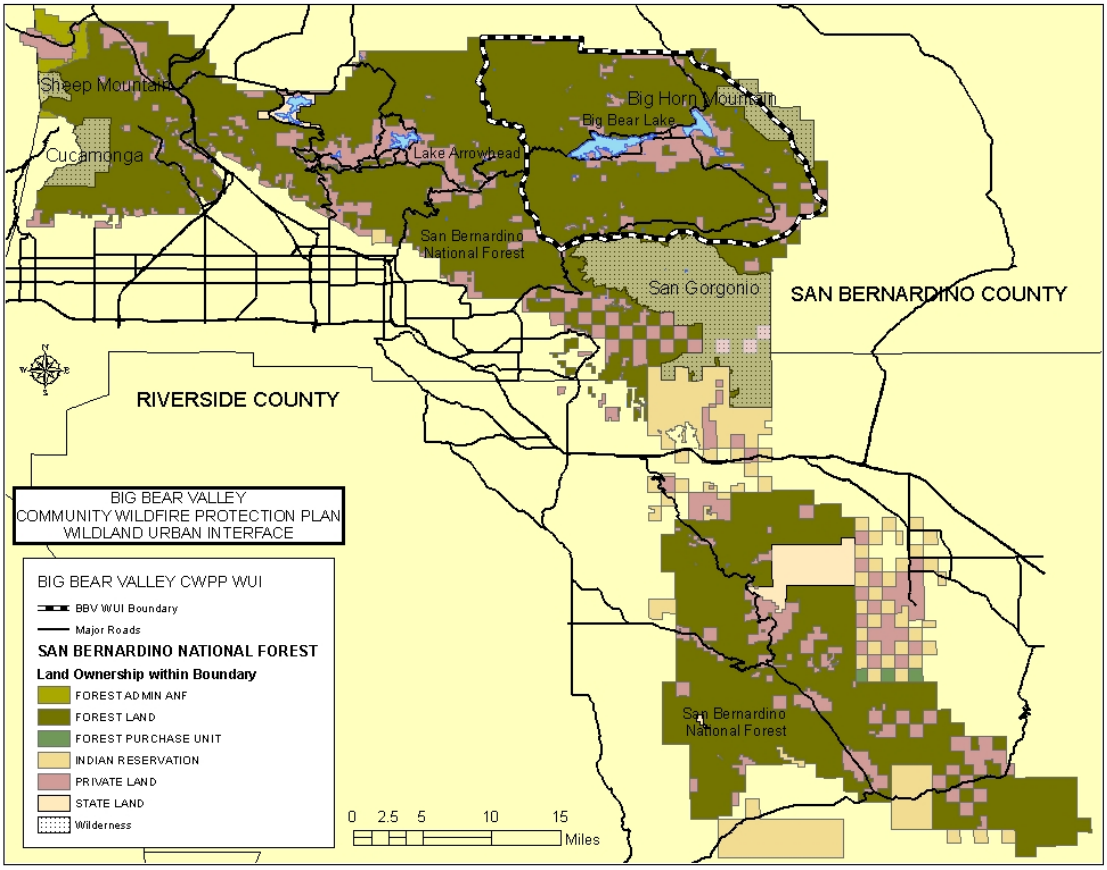
To accomplish this, a local focus group met on an as needed basis for one and a half years to track the Plan's progress. On August 25, 2005, the community was invited to attend a special meeting to discuss and provide input on the boundaries of the Big Bear Valley WUI and to establish community priorities for projects within the WUI.

Section 2.2 Big Bear Valley Wildland Urban Interface and Zone of Influence Boundaries

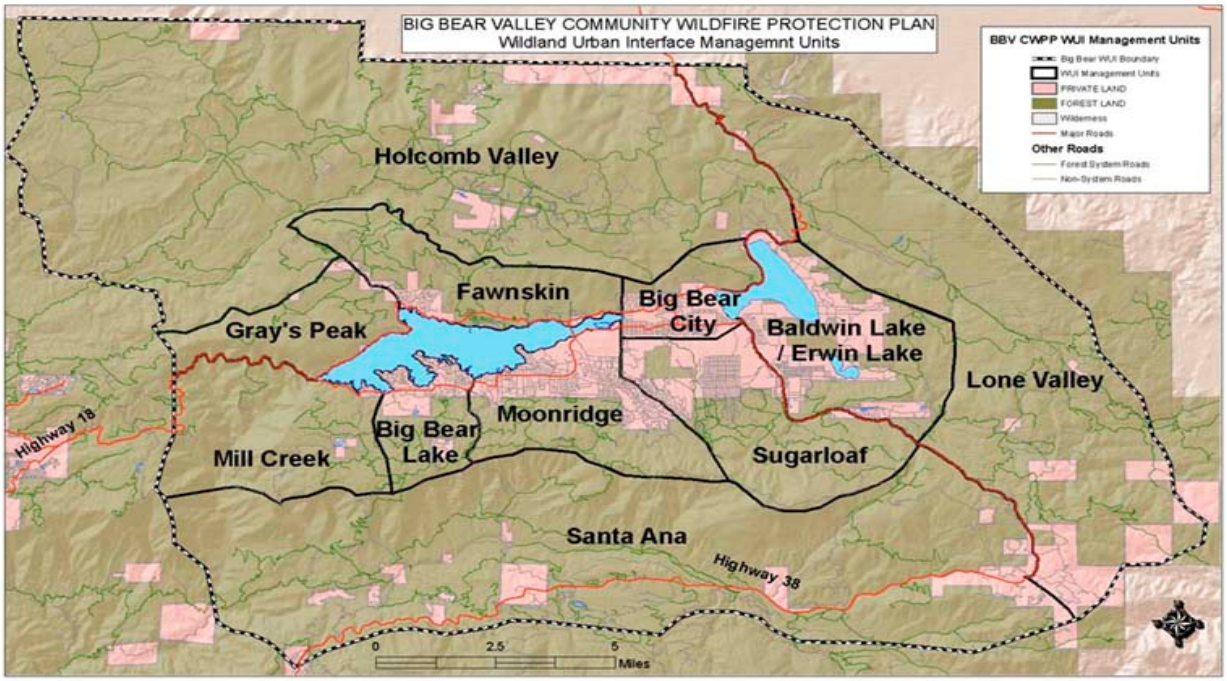
Consistent with the National Fire Plan, the Big Bear Valley WUI boundary is identified in Map 2.2.1. It was determined by evaluating past fire history, natural terrain, most probable threat area, strategic evacuation routes, watershed, drainages, fire regime class, and condition class that if a large fire were to evolve within the zone of influence, significant and detrimental impacts to the Plan's purpose would be affected.

The proposed overall size of the Big Bear Valley WUI is 170,447 acres. Within this area, differences exist on vegetation type, fire regimes, and condition classes that for practicality purposes make it viable for managerial rationale to identify eleven management areas that total the Big Bear Valley WUI boundaries. These management units will be identified by name in the project planning area, acreage, fire regime, condition class as well as the suggested priorities identified in each managerial unit.

Map 2.2.1 Big Bear Valley Wildland Urban Interface Boundary



Map 2.2.2 Big Bear Valley Wildland Urban Interface Management unit Boundary



Section 3.0 Community Legal Structures Jurisdictional Boundaries

The Big Bear Valley WUI consists of a mix of political subdivisions within its boundaries. It consists of unincorporated County areas known as Fawnskin and Baldwin Lake. This area encompasses ten square miles of private lands. The principle fire agency providing municipal fire protection is the San Bernardino County Fire Department. As this is an unincorporated area, the primary legal responsibility for vegetation fires and management is the California Department of Forestry and Fire Protection, which is protected by the U.S. Forest Service under an acreage exchange agreement.

In addition, the eastern portion of the Valley has unincorporated lands governed by the Big Bear City Community Services District (CSD). One authority of the Community Services District is to provide municipal fire protection for communities such as Big Bear City, Sugarloaf, Erwin Lake, eastern Moonridge, and Lake Williams. The CSD fire agency is called the Big Bear City Fire Department. The primary legal responsibility for vegetation fires and management is the California Department of Forestry and Fire Protection, which is protected by the U.S. Forest Service under an acreage exchange agreement.
The City of Big Bear Lake is an incorporated city government that includes a subsidiary fire district known as the Big Bear Lake Fire Protection District. As such, the Big Bear Lake Fire

Protection District has primary responsibility for both vegetation and structures within the City's boundaries as well as leased structures that exist outside the City's boundaries on Forest Service land.

The Forest Service provides primary protection for vegetation within the National Forest boundaries. On private properties outside the incorporated boundaries of the City of Big Bear Lake, they provide services within their scope of responsibilities, that of extinguishments of vegetation fires and structure fire exposure protection.

All fire agencies participate in Valley-wide automatic and mutual aid agreements that provide mutual assistance to each other. Seemingly, this mixed type of service appears seamless at the response level. It works quite well and appears to have minimal overlap.

The communities of Big Bear Valley have a high percentage of dwelling units that are vacant or second homes for most people. Table 3.1 indicates that a total square mile area of the communities that contain 95% of structures at risk is 26 square miles. The total assessed value for all communities in the Big Bear Valley is approximately $4 billion. The Forest Service leases land to individuals. There are over 470 special use dwellings on Forest Service leased land within the Big Bear Valley WUI. The assessed value for these structures range between $376 million to $752 million. Additionally, the total number of structured campground/RV spaces within the Big Bear Valley WUI is approximately 700 with an assessed value of $1.5 million. Campgrounds have an average of 40,000 visitors each year.

Section 3.1 Population

The current estimated population for the Valley as identified in Table 3.1 is 19,822. This was derived from the 2000 census statistics and current planning & economic documents. This is an increase from the year 2000 of 2,652 or a 15.4% increase in five years or an annual percentage rate of 3.1%. Considering the current population, a projected permanent population for 2015 is 25,768.

According to the U.S. Forest Service, the San Bernardino National Forest is home to approximately 100,000 permanent residents of which 20% are located in the Big Bear Valley. Yet, as with any tourist community, daily visitor populations (DVP) are just as important to include when determining the total population of a community.

The daily visitor population (DVP) as identified in Table 3.1 is equal to 16,384. This equates to approximately 5,943,660 visitors annually. According to the San Bernardino National Forest Business Plan, the estimated DVP in the San Bernardino National Forest is equal to 100,000 people. The Big Bear Valley comprises 16% of the total average daily visitor population that visit the San Bernardino National Forest. Many of these are second homeowners and/or visitors. Certainly, seasonal fluctuations occur. Two ski resorts are located in the Big Bear Valley. For the 2004-05 ski season, a recent published report indicated an estimated three million skiers chose to ski at Big Bear Valley resorts. The

summer season enjoys the next largest influx of visitors with the fall season comprising the third largest season. According to this economic report, the slowest season is after the ski slopes close until June of each year. Generally, there are daily fluctuations that occur as well with the weekends and holidays seeing a higher influx than other days of the week. The Big Bear Valley is located within two to three hours of twenty million people.

The significance of the DVP is an important element to consider when evaluating the significance of the Big Bear Valley. In comparing the DVP in the Big Bear Valley to other well known tourist sites, the Big Bear Valley DVP is equal to the combined total annual visitors to Mount Rushmore National Memorial, Zion National Park, and Bryce National Park. The three parks combined have a population of six million annual visitors. At 16% of the DVP of the San Bernardino National Forest, the Big Bear Valley has the single largest percentage of any community in the San Bernardino National Forest.

Other communities that see a portion of the San Bernardino National Forest DVP are Idyllwild, Blue Jay, Crestline, Crest Forest, Lake Arrowhead, Wrightwood, Lytle Creek, Running Springs, Green Valley, Arrowbear, Forest Falls, Gardner Valley, Angeles Oaks, and other smaller communities. These communities comprise the remaining percentage of the estimated daily visitor population.

The total daily population of the Big Bear Valley including daily visitors and permanent residents as identified by Table 3.1 is approximately 36,106.

Table 3.1 Big Bear Valley WUI Values at Risk

Communities of Big Bear Valley WUI	Population Daily Transient Population/Perma-nent	Square Miles	Housing Units	Commercial Industrial Square Feet	Assessed Value
City of Big Bear Lake & Fire Protection District	10,250 11,250/6028	8 9	9,210 9,210	1.8 M 1.8 M	$2 B $2 B
Big Bear City Community Services District	4,500/12,584	21.13	10,400	849,475	$1,611B
Unincorporated area of BBVWUI protected by County Fire Department	250/1210		1,000	45,000	$411 M
Forest Service Buildings			NA	30,000	$4.5 M
Special Use Housing	260/0		470	376,000	$376 M to $752 M
Campground/RV Spaces	2,800****		700		
Non-assessed Buildings & Equipment **	Reserved for Future	Reserved for Future	Reserved for Future	Reserved for Future	Reserved for Future
Bear Valley Electric					$26 M
BBVWUI Total ***	*16,284/19,822				$4.091 B

* The current estimated daily transient population was derived from the Big Bear Economic Performance Report and the United States Forest Service Environmental Assessment Report. An estimated 5,943,660 people visit the Big Bear Valley annually.

** The non-assessed value buildings include churches, schools, government facilities, and portions of the ski resorts. The projected replacement value of electrical infrastructure exceeds $55 million in fixed facilities and equipment.

*** The estimated total does not include community infrastructure that may or may not be affected by a wildland fire, i.e., roads, water system, electrical transmission lines, telephone cables, boat docks, ski lifts, dams, etc. **In 2003, the estimated value of improvements for the Big Bear Valley was in excess of $9 billion.**

**** The population number was arrived at by using 700 camping/RV spaces times 4 occupants per space. Spaces are open seasonally. Amount is previously included in the DVP for the City.

Section 3.2 Demographics

The U.S. Census indicated that in 2000, the Big Bear Valley ethnicity consists of 81.5% Anglo Saxon, 13.3% Hispanic, and 2.5% African American/Asian/Indian. The age distribution indicated that 73.8% of the residents of the Big Bear Valley were less than 55 years of age. Strikingly, 53% of the households earned less than $44,999.

As anticipated in an area with high tourism, the employment rate of growth is cyclical. Yet, the overall job growth was strong during the period evaluated with the largest job growth occurring in the retail sector. The inflation adjusted increase in payroll from 1990 to 2000 grew an estimated $17 million, which is a 27.5% increase from 1990. Big Bear employers paid employees an average of $17,646 for full or part-time positions. The number of businesses expanded from 1990 to 2000 by 76 companies.

The Big Bear areas' total taxable sales reached a record $144 million in 2000. The year 2000 was the last year evaluated by this report.

Table 3.1 indicated that the projected assessed value within the Big Bear Valley is $4.091 billion. This does not include an estimated value to the water distribution system, wastewater treatment system or underground / aboveground utilities. Nor does it include structures that are not taxed, i.e., schools, churches, certain governmental buildings, and some buildings on federal leased land. The San Bernardino County Multi-Hazard Functional Plan identifies twenty buildings on their roll of critical governmental facilities of potential loss but failed to identify schools, churches, ski resorts or Forest Service buildings.

Section 3.3. Land Use Trends

The primary land use within the Big Bear Valley Wildland Urban Interface is single-family homes. There are approximately 16,872 acres of private land in the Big Bear Valley that is within the San Bernardino National Forest. Since there are a limited number of acres, there are ultimately a limited number of parcels. Most of the level lots or most desirable lots have been developed. The trend is for development on the less desirable, higher angled-sloped properties. These properties tend to be closer to the boundaries of the National Forest or open undeveloped areas.

Section 3.3.1 Density

The density of structures per acre varies greatly within the communities of the Big Bear Valley. Some older lots are several acres in size. In other tracts in Sugarloaf, Erwin Lake, and lower Moonridge, lot widths are twenty-five to thirty feet and lot sizes are approximately 2,500 square feet,

which can accommodate up to 17 dwellings per acre. Historically, these lots were designed for tent camping use, which evolved over time with structures. Other areas within the Valley have 4,500 to 5,000 square foot lots, allowing up to 10 structures per acre. The trend on these lots is to create multi-story dwellings to increase living space.

The City of Big Bear Lake allows a minimum setback of three feet for lots less than thirty feet wide while the CSD and the County requires a minimum of five feet on similar lots. Under the right conditions, a fire can and will transmit from one dwelling to another subjecting these highly dense areas to a potential conflagration. It has not been uncommon for firefighters in the areas of Sugarloaf and lower Moonridge to arrive on the scene and have multiple homes threatened or involved in fire.

A more important responsibility of a fire department is balancing the available water in the water main to the required fire flow of the structures. Lot sizes in the 2,500 square foot range of Sugarloaf, Erwin Lake, and lower Moonridge, consideration should include increasing the calculated fire flow for exposures and density. In accordance with the 2005 Insurance Services Office "Guide for Determining the Needed Fire Flow", dwellings constructed of Type V non-rated construction with a ten foot setback or less require a minimum flow of 1,500 gpm. Moreover, the existence of shake shingle roofs on previously constructed buildings compounds the probability of ignition and significantly contributes to the spread of fire. Thus, the Insurance Services Office adds 500 gpm fire flow to the base fire flow required for a dwelling. This brings the needed fire flow to 2,000 gpm. This is 100% greater than the current standards typically required by most fire agencies within the BBVWUI. Fire officials should collectively review the minimum setback requirements and minimum fire flow standards for communities of the BBVWUI and consider additional flow for proximity to vegetation density, type of construction, existing shake shingle roofs, vehicle access, exposures, etc.

Section 3.4
Utilities

Section 3.4.1 Electrical Power

The existing utility services transverses the canyon and ridges north of Lucerne Valley and the Santa Ana River basin. The electrical service lines feeding the Big Bear Valley cannot support the demand during the peak usage period. Consequently, the need to provide supplemental electricity was and is needed; a natural gas fed generator with 8.4 megawatts of production capacity was installed and is available during peak periods to meet consumer needs. Additional natural gas/diesel powered generating plants are being proposed that would generate smaller megawatts of power.

Table 3.1 identifies Bear Valley Electric (BVE) as one of the major values at risk. The projected replacement value of electrical infrastructure exceeds $55 million in fixed facilities

and equipment. BVE contains over 200 miles of overhead power lines that has an estimated replacement value of $26 million.

The California Public Utilities Commission mandates utilities to conduct tree and vegetation clearance in and around aboveground electrical power lines. Bear Valley Electric spends approximately $150,000 annually for tree trimming. Since 2003, BVE has spent over $700,000 removing dead and dying trees as a result of the bark beetle infestation. The estimated tonnage of biomass generated from tree removal is unknown. The electric company maintains a list of participants that wish to have wood chip material delivered as landscape material and/or dust & erosion control as an alternative to disposal at the local landfill. Although the potential utilization of woody biomass as alternative energy use is certainly possible, especially with an estimated 13 million dead trees in the San Bernardino National Forest, a detailed environmental impact and feasibility study has not been conducted that would give stakeholders, governmental leaders, and the communities of Big Bear Valley necessary information to pursue this issue.

Section 3.4.2 Natural Gas/Propane

Service is provided throughout the Valley. Certain areas do not have natural gas service, and therefore, propane tanks are heavily used in outlying areas, organized campgrounds, and leased Forest Service properties. It should be noted that one of the most important safety features that can be installed on propane tanks is that of non-combustible strap hold-downs. According to local fire officials, this is the one item that is missing from the majority of the propane tanks located in the Big Bear Valley.

Section 3.4.3 Waste Water Treatment District

The Valley has sewer services to most of the dwellings, commercial, and industrial buildings. Sewage is processed at a plant on the east end of the Valley, and the effluent is gravity fed to Lucerne Valley with a parallel line that transverses alongside of Highway 18. Camps, Forest Service leased cabins, and the majority of the northern Baldwin Lake area are not connected to the waste treatment facility.

Section 3.5 Hydrology

The City of Big Bear Lake Department of Water and Power and the Big Bear City Community Services District has conducted several studies concerning the hydrology in Big Bear Valley and has identified distinct water shed subunits. Table 3.5 identifies each subunit and the perennial yield of drawing capacity that can be extracted from the watershed. This is based on historical and actual records maintained by both departments.

Currently, the recharge ability of the watersheds seem resilient in that after five years of drought, the draw down on the water table has mostly risen back to normal levels with above normal precipitation after the 2004/2005 rainfall season. Although water conservation

measures and limited new construction can impose short-term solutions to a long term problem, the narrow residual estimated perennial yield of the defined aquifer versus estimated annual use only magnifies the potential impact that a large fire could create.

Conducting a study to determine the potential that a large fire could have on the watershed may be warranted. Watersheds are vital to the long-term economic stability of the Big Bear Valley as 100% of the water comes from local underground aquifers.

Table 3.5 Perennial Yield by Subunits

Subunit Name	Acre Feet
Millcreek	330 (arsenic & fluoride)
Village	290
Rathbone	1,100-1,200
Division	500-550 manganese issues
Erwin	600
Grout Creek	283 (unavailable to south shore)
North Shore Fawnskin	44
CSD Erwin	600
CSD West Baldwin Lake	500-1,000
CSD Van Dusen	800-900
CSD East Baldwin Lake	>100
Total	5,147–5,997 acre feet

The Department of Water and Power and the Big Bear City CSD maintain maps, which identify the boundaries of each watershed subunit. The watersheds start at the top of the ridgeline and transverse in and around Big Bear Valley. There is little known about the potential increase or decrease in the perennial yield of each watershed should the Forest Service conduct fuel treatment practices in these watersheds. A far more important issue that needs addressing is determining what effects a fire could have on the perennial yield of the subunit watershed, if one were to occur.

A fire could be detrimental to the Big Bear Valley watershed as a whole, yet dependent on the fire size, location in relationship to specific watershed(s), and/or intensity of the fire, it may have limited watershed impact. Unequivocally, a major fire significantly larger than 100 acres would not only have immediate impact on the watershed but lingering diminished watershed retention.

Augmenting the current watersheds' perennial yield through creating a recharge basin or by some other form may provide the "safety net" necessary if and when a large fire occurs that affects the watershed.

Other possible impacts to the watershed as a result of a small fire may occur that affects only a specific watershed subunit. For instance, a small fire (less than 100 acres) on a seemingly

level terrain tends to have little overall impact compared to a small fire in riparian streambeds where vegetation holds back and slows down the speed of running water and allows more infusion into the aquifer.

The crown jewel of Big Bear Valley is Big Bear Lake. Most generally, streambeds terminate in the lake. A decrease in water quality can also be an issue as a result of a small fire or fuels treatment. Measures should be taken to keep the clarity of the water relatively high.

Section 3.6 Schools

Within the Big Bear Valley, the Bear Valley Unified School District provides education through three elementary schools, one middle school, a high school, and one continuation school. The total number of children attending our schools is approximately 3,000. In addition, there are a number of private schools that add approximately 400 more students.

Section 3.7 Hospital

The Bear Valley Community Healthcare District provides emergency room service and patient care with forty beds.

Section 3.8 Emergency Operation Services

The Valley's emergency services operation system functions quite well. The Big Bear Valley Mountain Mutual Aid Association was developed to coordinate and facilitate resources to minimize the impacts of a disaster or emergencies on people, property, and the environment. It involves citizens, businesses, and governmental agencies. It works under the auspices of the San Bernardino County Office of Emergency Services and operates as a non-profit organization.

The organization has been pressed into service on several occasions due to floods, earthquakes, and fires. The process implements the National Incident Management System (NIMS) organizational structure. Other agencies within the Valley have department operating centers that are also utilized, i.e., Sheriff's Department, fire departments, the City of Big Bear Lake, and the United States Forest Service. Most of these rooms are of insufficient size to meet the demands of an Emergency Operations Center. During the 2003 Old Fire, the Emergency Operations Center was housed in a make shift apparatus bay of a fire station because no dedicated building of sufficient size was available. Funding remains the single biggest roadblock to providing a Valley-wide Emergency Operations Center.

Mountain Area Safety Taskforce (MAST) organizations are active in both the San Bernardino and Riverside Counties. Both the San Bernardino and Riverside County MAST organizations are comprised of governmental agencies, private companies, and volunteer organizations concerned with public safety in the mountain areas of their respective jurisdictions. The two County MAST organizations have joined forces to coordinate their

response to the San Bernardino/San Jacinto Mountain Area vegetation mortality emergency at the regional level. While each County level MAST organization has its own County specific concerns, their joint efforts are rooted in a common intention to reduce the current region-wide risk of a major fire and to minimize impacts on mountain communities should one occur. A five-point action plan has been initiated by the two County MAST organizations as follows:

- Assure public safety - critical elements to this action include developing evacuation plans, clearing potential hazard trees from routes in and out of the mountains, and providing emergency planning and hazard mitigation information to the public.
- Obtain funds - work with local, state, and federal legislators to obtain funds to combat the problem.
- Reduce fuel and create fuel breaks - this means planning and organizing the removal of dead standing trees, the reduction of fuel on the ground, and the creation of defensible space around developed areas and homes.
- Develop commercial use or disposal options for waste wood products.
- Identify and develop plans for ensuring long-term forest sustainability.

MAST common priorities for the Big Bear Valley Wildland Urban Interface:

- Evacuation Routes – 111 miles
- Communication Sites – 55 acres
- Big Bear Valley Wildland Urban Interface – 170,447 acres
- Public use and administration facility protection

Section 3.9 Fire Protection Response/Readiness

Table 3.9 evaluates the number of factors that determine the level of readiness and response to a fire within the Big Bear Valley Wildland Urban Interface. The Big Bear Lake and the Big Bear City Fire Departments jointly provide one on-duty chief officer twenty four/seven.

Table 3.9 Fire Protection Response/Readiness

Department	Equipment Number/Type	Manufactured Year	Minimum Staffing
Big Bear Lake Fire Department	1-Type 1 Medic Engine	2004	4-24-7
	2-Type 1 Engines	1989/1984	Cross staff
	1-Type 3 Brush Engine	2003	1 Paid Call, hard staffed on weekends
	1-Type 2 Water Tender	2003	7 Paid Call Firefighters
	2-Command	2001/2003	
	1-Truck Company	2001	
	1-Lt. Rescue	1994	
	1-Utility Vehicle	1997	
San Bernardino County Fire	1-Type 1 Medic Engine	1991	2-24-7
	1-Type 3 Brush Eng.	1994	Six Months
	1-Type 2 Water Tender	1984	3-24-7 Six Months
	1-Command Vehicle		
	1-Lt. Rescue/1-Snow Cat	2002/1994	
United States Forest Service	3-Type 3 Brush Engines	1993, 2001, 2003	5-8-7 year round
	4-Type 6 Engines	2000, 2001, 2-2004	1-8-7 year round
	2 Command Vehicles Type 1 hand crew Type 2 hand crew	2-2003, 2-2001, 2001 rental	1-8-7 year round 20-8-5 Six Months On standby year round
Big Bear City Fire Department	3-Type 1 Engines	2-1990/2004	2-24-7
	1-Type 3 Brush Engine	1997	Cross Staffing Units
	1-Type 2 Water Tender 1- light Rescue	1978*	Situation up-staffing on winter weekends and holidays 2-24-7 Cross Staffing
	3-Medic Ambulances		6-24-7 (One Paid Call)
	3-Command Vehicles	2002/2004	
	1- Snow Cat		Cross Staffing

***NFPA Standard 1901 recommends the replacement of fire apparatus built prior to 1979.**
**** Additional resources are available through the mutual aid system**
***** Resources identified are located within the BBVWUI.**

Section 3.9.1 Specialized Equipment

Currently, the Type 1 engine for San Bernardino County contains a portable gel inductor unit. Some Type 1 engines, Type 3 engines, and water tenders have drafting capability and portable pumping units for potential streambeds, small lakes, pools, etc. but not all. Foam eductors are built into both the City of Big Bear Lake and Big Bear City CSD's Type 3 engines and water tenders.

Section 3.10 Water Distribution System Readiness

To evaluate the water distribution system, a review of the water grid map system was conducted. This grid map system contains sizes of mains, location of hydrants, and pressure reducing valves similar with other water grid map systems. Table 3.10 indicates the fire flow that is available at 20 pounds per square inch (psi). Hydrants in proximity to the National Forest were analyzed to assure that the projected flows would be capable of providing the minimum required fire flow for residential occupancies as required by Appendix III-A of the California Fire Code and/or local standards. The minimum standard fire flow at 20 psi residual pressure for communities in accordance with Appendix III-A is 1,000 gpm. The City of Big Bear Lake and the Big Bear City CSD amended their portion of the code to add a requirement that dwellings in excess of 3,600 square feet would be required to meet the fire flow of Uniform Fire Code, Appendix Table III-A-A-1., which establishes a minimum standard of 1,500 gpm for residential.

The review evaluated public versus private systems, long dead end systems, pipe diameter, and elevation to determine hydrants that would most likely not be able to provide the required fire flow. Ultimately, this means each agency needs to review their water system capabilities within their communities and determine the appropriate action to be undertaken. Water purveyors must be prepared to adopt a capital improvement schedule to help remedy the deficiency of small pipe sizes, loop dead-end lines, improve hydrant spacing, and increase water storage capacity. Table 3.10 indicates that in some areas of the communities, the percentage of the required fire flow is as low as 17%. Many evaluated locations only provide 40 - 70% of the currently recommended flow of 1,500 gpm. The water grid map number W-02 provides only 40 - 50% of the required fire flow (see Table 3.10) In general, the hydrants that are deficient have smaller mains, some two to four inches in size. These are located in the older areas of the communities of the Big Bear Valley.

In review of historical documents, the 2003 Urban-Wildland Interface Code states, *"that an approved water supply for the use of fire protection services to protect buildings and structures from exterior fire sources <u>or</u> to suppress structures fires . . . shall be provided."* The base residential fire flow suggested by the Insurance Services Office is 1,000 gpm for non-vegetated areas, which is the same as Appendix III-A of the California Fire Code. Finally, San Bernardino County's General Plan establishes a 2,000 gpm minimum fire flow requirement for subdivisions with 4 to 7 dwellings per acre.

Today, homes are increasing in size and density. In many cases, they exceed 3,600 square feet. This warrants an increase in the required fire flow to 1,500 gpm. Planning for dwellings larger than 3,600 square feet and allotting a minimal amount for at least 250 gpm for proximity to vegetation would be warranted. These issues combined more than justifies the need to establish a fire flow requirement of greater than 1,000 gpm for one or two unit dwelling units.

The storage capacity available for fire flow was also reviewed. The fire flow capacity was evaluated based on the need to provide 1,500 gpm for two hours. For the first sixteen hydrants listed, a storage capacity of 3 million gallons was used. Column six of Table 3.10 identifies the percentage of fire flow versus storage capacity of the tank. In the area identified as Lake Williams, the capacity of the tank equals the total volume that should be reserved for fire flow.

Table 3.10 Wildland Interface Fire Flow Information

(1) Water Grid Map Number	(2) Hydrants Evaluated	(3) Flow in gpm at 20 psi	(4) Flow in gpm at 20 psi	(5) Percentage of Required/Recommend Fire Flow Provided	(6) Fire Flow Storage Capacity vs. Available Capacity
M-15	214/490	1,336	1,044	89% / 69%	18% / 3M
M-20	224/490	1,443	1,044	96% / 69%	18% / 3M
B-02	471/475	1,747	2,050	116% / 136%	18% / 3M
B-23	394/713	500	520	33% / 34%	18% / 3M
M-08	547/197	2,358	1,354	157% / 90%	18% / 3M
M-12	578/038	1,378	750	91% / 50%	18% / 3M
B-28	P-25/272	258	1,333	17% / 88%	18% / 3M
M-21	614	1,378	1,078	91% / 71%	18% / 3M
W-02	DWP/No #	750	600	50% / 40%	100% / 160T
E-04	DWP/NO#	750	600	50% / 40%	32% / 500T
E-05	DWP/No#	750	600	50% / 40%	32% / 500T
F-7	44/67	375	717	25%/47%	13%/1,334M
F-2	DWP/No#		1517	100%	13%/1,334M
F-4	46/64	925	809	61%./53%	13%/1,334M
Pg. 28&29	CSD/Erwin/DWP		920	61%	13% / 2,160M
Pg. 6	CSD Whis For	1,076	1,336	71% / 89%	13% / 2,160M
Pg. 7	CSD416 Pioneer	850		56%	1.5% / 6M
Pg. 7	CSD1144 Anita	1,745		116%	1.5% / 6M
Pg. 7	CSD113 Sequoia	2,300		153%	1.5% / 6M

Section 3.11 Insurance Ratings

The latest Insurance Services Office classification that was conducted in the fall of 2001 indicates an overall 4/9 rating. This means that in areas of the City of Big Bear Lake that have hydrants, the classification is 4. In non-hydrant areas, the classification is a 9. The City of Big Bear Lake Department of Water received an overall classification of 1. This is quite good considering that there is some recognition that water main sizes in some areas are inadequate to deliver the required fire flow. The ISO "Improvement Statement" identifies that the single largest reason for receiving an overall 4 classification was the limited number of engine company personnel. Similarly ISO ratings for the San Bernardino County and Big Bear City Fire Departments are 5/4/9.

It must be said that the ISO rating does not factor in fire loss statistics, cost effectiveness of their standards or prevention, and defensible space practices within the communities. Most importantly, the ISO rating does not consider a Wildland Urban Interface scenario in its equation to determine its rating.

Section 3.12 Suggestions to Enhance Emergency Fire Response

Emergency response vehicles are hampered by inadequate fire department vehicle access. It is estimated that 20% of the roads in the County unincorporated area do not meet current minimum County street standards. Equally important is that approximately 75% of the roads are accessible by a Type 1 engine and 85% are accessible by a Type 3.

In the City of Big Bear Lake, 5% of the roads do not meet the minimum road width established by the California Fire Code. Two percent are too steep to drive on in inclement weather and approximately 5% of the roads are long, dead end roads with little to no turnaround space.

Currently, approximately five percent of the roads in the Community Services District are unimproved roads. Twenty-five percent of the roads do not meet currently adopted road width standards. Five percent of the roads are too steep for inclement weather. Ten percent of the roads are long dead end roads with limited turning capabilities.

Driveways, or lack thereof, pose a major challenge for all fire engines throughout the Valley. Many homes do not have driveways. Some driveways exceed the Fire Code minimum distance of 150 feet. Others are not all-weather surface nor constructed sufficiently to withstand the weight of heavier type equipment and thus, could crack or collapse under the right conditions.

Most driveways in excess of 150 feet lack sufficient turnaround capabilities as required by the California Fire Code.

Most generally, fire department access difficulties are a result of lots developed prior to the implementation of current fire safety standards that are currently in place in all Big Bear Valley communities.

Section 3.12.1 Traffic Congestion

From time to time, traffic can be congested along Big Bear Boulevard. This impacts response times as well as increases the likelihood of an accident involving an emergency response vehicle.

To address current congestion issues along Big Bear Boulevard during peak traffic times, providing all emergency equipment with an Opticom system that activates traffic signal

lights to clear directional traffic would aid in reducing the response times in and around the Big Bear Valley.

Section 3.13 Addressing and Street Signs

Posting addresses on dwellings and assuring all street signs are present is an important key advantage to the expeditious response of fire departments.

Usually, local fire departments have map books and are familiar with the community enough that the lack of addresses and street signs are usually not a significant problem. However, it is incumbent upon us to realize that out-of-town strike teams, out-of-town Sheriff deputies, and disaster teams do not always have the luxury that the local departments have, and therefore, in many large campaign fires, lack of addressing and street signs hinder their response. The communities of Big Bear Valley should annually inspect these items.

Section 3.14 Specialized Equipment Needs

An array of specialized equipment is available for purchase. For structure protection, they include fire protection blankets and compression air foam units or gel type systems. All offer some degree of added protection.

All specialized equipment must be evaluated by each agency and community as to how best such equipment could be utilized.

Therefore, this plan suggests that all fire departments and/or political subdivisions explore options available to them from a cost versus benefit approach when consideration is given to purchasing such specialized equipment.

Section 3.15 Firefighter and Public Training Certification and Qualification

California offers a full range of training for all positions within the fire service, which is available through the California Office of the State Fire Marshal, Education and Training. This includes all levels of the incident command system and emergency operations management. These standards have been adopted for use by local fire agencies.

Public training for emergency management through Certified Emergency Response Teams (CERT) is available to the general public who choose to be involved. The greatest hindrance in achieving a greater success of this program is having a dedicated emergency manager and ongoing training.

Section 3.16 Defensible Polygons

Left blank for future discussion.

Section 3.17 Fuel Breaks (Strategic/Shaded)

Fuel breaks have a long history in the western United States. The primary reason for fuel breaks as any other type of fuel treatment is to change the behavior of the fire so significantly that, depending upon objectives and purpose of the fuel break, the spread of wildfires would be altered. In a forested area, natural fires have occurred that burn away ground vegetation and forest litter leaving larger more fire-resistive trees to live creating a shaded appearance with minimal understory vegetation. Fuel breaks are not designed to stop the progress of the fire but change the behavior by allowing a greater probability of fire extinguishment from attacking firefighting forces. Fuel breaks differ from the traditional firebreaks. With firebreaks, all vegetation is removed down to mineral soil.

No absolute standard for the width of a shaded fuel break is available. The width and extent of treatment vary dependent upon topography, vegetation structure, potential fuel radiant heat flux, weather potential, crowning potential, economic conditions, and community desires. Discussing fuel breaks of any type and width begins with identifying the current regime class and condition type within the prescribed area. Table 5.1 identifies the regime class and condition class of each management unit within the Big Bear Valley Wildland Urban Interface. Fuel break prescriptions must describe the extent of the fuels to be removed and the residual fuels in the form of the standard fuel models so that potential fire behavior can be analyzed. Post treatment evaluation of the surface fire intensity should be conducted to assure flame length objectives have been met.

Just as important as determining the appropriate width of the fuel break is to increase the height of live crown base by limbing the tree up, reducing surface fuels, increasing the width between live tree canopies of various sizes and ages, and removing all dead, dying & diseased trees within the shaded fuel break.

Section 3.18 Evacuation Plan

The San Bernardino County Sheriff's Department maintains an exhaustive Emergency Evacuation/Reentry Plan for the Big Bear Valley, dated June 2005. During the Old Fire in 2003, the Emergency Evacuation/Reentry Plan for the Big Bear Valley was successfully implemented. A systematic post evacuation review was conducted to evaluate any changes that should be implemented for future events. It was determined that repopulation of the Valley will require further review and plan modification. The agencies involved in the evacuation plan are the Big Bear Lake Fire Protection District, Big Bear City Fire Department, San Bernardino County Fire Department, San Bernardino County Sheriff's Department, United States Forest Service, California Highway Patrol, American Red Cross, CalTrans, and the San Bernardino County Road Department.

Section 3.19 Emergency Communication System / Neighborhood

Since the Old Fire of 2003, the agencies of the Big Bear Valley and the Big Bear Valley Fire Safe Council have incorporated changes in the community's communication system. The first change incorporated the implementation of the Telephone Emergency Notification System (TENS). Essentially, it is a reverse 9-1-1. TENS was implemented to provide telephone notification to all residents of an emergency and to provide specific instructions of what measures to follow during an evacuation.

A second notification system, SCAN USA, is a public warning system that almost instantaneously allows fire departments to broadcast emergency information directly to computers, mobile phones, pagers, and PDAs at no cost to the agencies or the residents. Residents can log onto SCAN USA's website to receive SCAN alerts.

The third community alert system is a Valley-wide siren alert. Because many people work and play outside and many rental homes do not have telephones, relying solely on a telephone callback system may not be enough to reach all Valley residents. The community siren alert system will be strategically placed in four locations throughout the Valley. The goal is that individuals hear the sirens throughout the Valley and tune in to the local radio or TV station for instructions as to what to do. This is similar to the use of sirens for tsunami prone communities. In 2004, a grant was awarded to purchase the siren alert system. Its projected installation will occur in late 2006.

Currently, fire agencies are totally reliant on telephone hard wire system communication between the public and dispatch. Many times, the telephone system has been interrupted and communications have affected emergency response vehicles. Fire officials are encouraged to engage in negotiation with local telecommunications to improve the reliability of the emergency response notification system.

Section 3.20 Safety Plan

Currently, potential areas of safe refuge have been determined Valley-wide by various agencies and are a part of the Emergency Evacuation Plan. All safe refuge areas are considered temporary refuge areas and not a long-term alternative. Long-term evacuation needs are addressed in the Emergency Evacuation Plan or in various other documents. The Emergency Evacuation Plan is a confidential document developed and further refined after the successful mountain evacuation during the 2003 Old Fire. The evacuation plan uses a tiered approach to evacuation, i.e., warning, voluntary, mandatory, immediate, and shelter-in-place.

Section 3.21 Escape Routes

Maps of various escape routes are maintained and distributed based upon the potential each fire could bring. These routes are part of the Emergency Evacuation Plan maintained by the San Bernardino County Sheriff s Department.

Alternate neighborhood escape routes are not as well known by locals and certainly not well known by visitors of the Big Bear Valley. The Emergency Evacuation Plan does not consider neighborhood escape routes. At this time, alternative escape plans would require a possible escort. In the future, consideration should be given to mapping alternative routes and posting signage along the road that identify the route until the route connects to a major thoroughfare.

Section 3.22 Shelter-in-Place Procedure

The current Emergency Evacuation Plan does not consider shelter-in-place procedures as a viable alternative to evacuation except as a last resort.

Section 3.23 Education

One of the key components of the Purpose and Need section of this Plan identifies the need to provide ongoing public education and mass media to provide a sustainable message about a variety of wildland fire safety issues from defensible space, what to take when evacuating, what to do about smoke drift issues, upcoming possible control burns, and forest management issues. Currently the County of San Bernardino with grant funding and through the MAST organization is seeking a marketing firm to assist with long-term public education strategies.

Section 3.24 Fire Safe Council Resources

The Big Bear Valley Fire Safe Council is an active organization that can cross political subdivisions to accomplish short and long term goals of this Plan. They have resources that are available for community-wide public education programs. The Big Bear Valley Fire Safe Council has aggressively pursued the implementation of Valley-wide Chipper Days as well as hosted community informational meetings on the Community Wildfire Protection Plan.

Ongoing plans of the Big Bear Valley Fire Safe Council include continuing attendance at seminars and meetings as well as public education events and hosting Valley-wide Chipper Days. Other activities and projects could be to conduct fuel reduction on private properties and to obtain grants for replacement of more fire resistive roofing as well as educating

citizenry about the need for the reintroduction of fire to both private and public lands. Another idea might be the purchase of Woody the Owl or Chipper the Beaver as a mascot.

Section 3.25 Fire Safe Inspector Program

Fire safe inspector programs have always been a part of the ongoing education program of any fire department. The California Department of Forestry has assigned engine companies to inspect private properties for compliance with the requirements of the Public Resource Code, Section 4291 on State responsibility area lands (SRA). The United States Forest Service applies the same State standards to structures and dwellings located on Forest Service land.

Currently, the Big Bear Lake Fire Protection District and the Big Bear City Community Services District contract out to the San Bernardino County, Land Use Services Department, Code Enforcement Division for abatement of vegetation and other fire hazard abatement issues within the Big Bear Valley. In 2005, the fire hazard abatement process was "kicked up a notch" to include limbing up trees, shrubs, and plants as well as concentrating on the removal of dead vegetation. Problematic with this change was the need for extended administrative personnel hours to explain to the community what was required to comply with the abatement notices. To help explain the changes from past standards, it was evident to the fire chiefs of the Valley that a fire safety inspector position would be beneficial.

Additional projects for the fire safety inspector could include pre-construction inspections, posting of addresses, LPG tank inspections, fire flow analysis, and public education. These types of inspections could identify additional tree thinning and vegetation removal needed to assure that new construction meets vegetation clearance requirements.

Section 3.26 Hazardous Abatement Laws

When it comes to fire hazard abatement and specifically fuel reduction, even though enforcement laws are in place for local fire departments, there remains significant ambiguity within various laws as to meanings of terms and their application. On the other hand, some vegetation clearance laws are very specific, yet not practical for implementation in a wildland intermix setting where trees and bushes are part of the native landscape. Inherently, this poses a problem in enforcement practices. Although standardization of application has occurred between agencies, review and evaluation of creating specific laws and standards that truly fit the communities of the Big Bear Valley would be desirable to enhance the consistency of vegetation clearances and fuel reduction measures.

When evaluating the hazard classification of new and existing development areas of a community, the use of the National Fire Protection Association Standard 1144 or the International Code Council's Wildland Urban Interfaces "Appendix C" provides a systematic approach to evaluating various hazard classifications. Fire protection planners would be advised to utilize either of these standards when determining hazard classifications within the

Wildland Urban Interface subunits. It needs to be stated that although the National Fire Protection Association Standard 1144 or the International Code Council's Appendix C can be used as published, agencies would be advised to evaluate these standards and/or make modifications that would more generally fit local topological, climatological conditions.

Section 3.27 Senior / Disabled Assistance

The Big Bear Valley Emergency Evacuation Plan encompasses the evacuation of senior citizens. During the Old Fire, this task was primarily accomplished by the Mountain Area Transit Authority (MARTA). Furthermore, Bear Valley Electric and the local fire departments maintain information for individuals with special health related needs.

Section 4.0
General Environmental Conditions of the Wildland Urban Interface

Section 4.1 Upper San Gorgonio/Big Bear Mountain Range

This subsection comprises the higher elevations and cooler parts of the San Bernardino mountains. The climate is temperate to cold and sub-humid, MLRA 22d. The following information is provided word for word from the Natural Resource Conservation Service website.

Section 4.2 Topographical

Topographically, the 270 square mile area generally consists of north/south facing slopes. Elevations range from as low as 4,000 feet to 10,200 feet. The major ridges generally run east to west, specifically the Sugarloaf Mountain and Holcomb Valley ranges.

Section 4.3 Lithology and Stratigraphy

This subsection contains mostly Mesozoic granitic rocks. Also, there are some pre-Cambrian Gneiss and Paleozoic marine sedimentary rocks. The mountains are a horst with faults and steep escarpments on the south/southwest, east/northeast, and west/northwest sides. Quaternary non-marine sediments and recent alluvium are small but important components of the subsection.

Section 4.4 Geomorphology

This is a subsection of steep and very steep mountains with narrow to rounded summits. There is a high rolling plateau surface at about 6,500 to 7,500 feet with some Quaternary fluvial and lacustrine deposits on it. The subsection elevation range is from about 4,000 feet

up to 11,502 feet on Mount San Gorgonio. Mass wasting and fluvial erosion are the main geomorphic processes.

Section 4.5 Soils

The soils on the steeper slopes mostly belong to the Inceptisol or Entisol orders. These soils tend to be shallow to moderately deep (20 to 40 inches) over bedrock. They are classified as Xeropsamments, Haploxerepts (formerly Xerochrepts), and Dystroxerepts (formerly Xerumbrepts). The textures of these soils typically range from sandy to loamy with clay contents usually between 5 and 15 percent. A majority of the soils contain 35 to 75 percent rock fragments 1/8 inch to 11 inches in size. Soils on more stable or more protected landscape positions express evidence of increased organic matter production as thicker darker colored surface horizons. In some of these positions, soils have less than 35 percent rock fragments but retain the typical 5 to 15 percent clay contents. The soils are somewhat excessively drained where the depth to bedrock is less to well drained where the soils are deeper.

Soils on flatter slopes share many of the same characteristics as their steeper neighbors. They belong to the Inceptisol and Entisol orders, and have similar classifications, clay contents, and rock fragments. Some of these flatter to nearly level areas have soils, which are represented by the Mollisol order. These soils are usually deep or very deep (40 to 60 or more inches), darker and/or wetter than adjacent soils on steeper slopes. Most tend to have clay contents of 12 to 25 percent and many have less than 15 percent rock fragments. The soils tend to be well drained where the land is sloping and somewhat poorly to poorly drained where slopes become flat to depressional or where water tables are near to the surface.

Most of the soils are lacking in carbonates although in a few isolated places, particularly on the northeast side of the area, there are soils which have both free carbonates and cemented layers where carbonates are an accessory cementing agent.

Soil moisture regimes are xeric with cool, moist winters and warm, dry summers. Most moisture falls during the winter and is particularly effective for leaching the soil. The xeric moisture regime is typical for areas influenced by a Mediterranean climate. Exceptions to the xeric moisture regime are aquic soil moisture regimes in depressional or wet areas where water saturates the soil for a few too many days each year.

Soil temperature regimes are classified as mesic at all but the highest elevations. A mesic temperature regime has a mean annual soil temperature at 20 inches of between 47 and 59 degrees Fahrenheit. The highest elevations (current data suggests above 7,000 feet) have soil temperatures at 20 inches of less than 47 degrees Fahrenheit.

Section 4.6 Vegetation

The predominant natural plant community is jeffery/ponderosa pine series. There are small areas of coulter pine series, mixed chaparral shrub lands transitioning to the east where there are juniper/pinion woodlands. Some fir and lodgepole pine series are common in the north facing higher elevations.

Characteristic Series by Life Form Include:

Grasslands: Alpine habitat, beaked sedge, bur-reed, creeping ryegrass, shorthair sedge, sedge, and tufted hair grass series.

Shrub lands: Big sagebrush, black sagebrush, bush chinquapin, deer brush, eastwood manzanita, green leaf manzanita, interior live oak - chaparral whitethorn, interior live oak - canyon live oak shrub, interior live oak - scrub oak shrub, mixed saltbush, mixed scrub oak, mountain whitethorn, rothrock sagebrush, rubber rabbit brush, scrub oak, and scrub oak - chamise series.

Forests and woodlands: Aspen, black cottonwood, black oak, coulter pine - canyon live oak, curlleaf mountain-mahogany, incense-cedar, jeffrey pine, ponderosa pine, limber pine, lodgepole pine, mixed conifer, mixed subalpine forest, mountain juniper, singleleaf pinion, and white fir series.

Section 4.7 Climate

The mean annual precipitation is about 30 to 40 inches. Much of the precipitation is in the form of snow. Mean annual temperature is about 40° to 50° Fahrenheit. The mean freeze-free period is about 150 to 200 days.

Section 4.8 Surface Water

Runoff is rapid. All but the larger streams are dry through the summer. There have been natural lakes on the high plateau recently, but any lakes that persisted until historical time have been replaced by reservoirs. The major body of water is Big Bear Lake. Baldwin Lake is a relatively shallow body of water and becomes a dry lake during periods of low precipitation.

Section 4.9 Underground Aquifers & Water Shed

A critical component of the National Fire Plan is the need to maintain the nation's watersheds. The watershed of the Big Bear Valley is critical to the survivability of the Big Bear Valley economy. A Geoscience Report, *"Re-evaluation of the Maximum Perennial Yield of Big Bear Lake and a Portion of Baldwin Lake Watershed"* August 2001 identifies the maximum perennial yield of each subunit within the Big Bear Valley. This report further identifies that, for the most part, the aquifers are distinctly separated into an upper and lower

aquifer. The significance is that the main domestic use aquifer is the lower aquifer. Its primary recharge occurs from deep percolation of runoff where the bedrock is in contact with the alluvium. Most generally, this is thought to occur high in the mountains above the Big Bear Valley floor.

Although the above research explains the use of the lower aquifer, the alluvium aquifer (upper level aquifer) percolation is intercepted by the vegetation and development that occurs aboveground. Little is known about the amount of absorption of such vegetation. No research is known to analyze the estimated volume that vegetation consumes nor are there estimates of the increase of available water, as a result of providing a treatment of the forest.

The overly dense forest structure that has not burned in the last 105 years could be said to have intercepted and/or retained its maximum capacity, logically depriving historical levels of water from percolating to the lower aquifer. However, the 2004/2005 rainfall statistics, which were 150% higher than normal, indicate that the water table in the lower aquifer has mostly risen back to normal levels. Yet what remains at issue is that the narrow residual estimated perennial yield of the defined aquifers versus estimated annual use leaves little to no differential from the potential impact that a large fire could cause.

Section 4.10 Threatened and Endangered Habitat Types

Within the Big Bear Valley Community Wildfire Protection Plan, there are over thirty-nine species that are listed in the Endangered Species Act. There are also sensitive species listed by the San Bernardino National Forest, the Watchlist, the Management Indicator Species (MIS), and the Land Birds (Neotropical Migrants) list.

This Plan proposes the continual implementation of the environmental review of any treatment projects to assure the ongoing safety of the wildlife species.

Yet, when a fire occurs, the current fuel loading and tree density of the forest could potentially have irreparable and long lasting impacts to the listed environmental species. Certainly, the tree density has led to an increase in insects and disease agent populations beyond historic levels.

An example of the type of ecosystem damage that could occur is evident in the once beautiful Cedar Glen area. The picture to the left illustrates the ecosystem damage that a high intensity fire causes.

The Big Bear Valley Wildland Urban Interface ecosystem is currently susceptible to the same type of damage that occurred in Cedar Glen. The forest vegetation structure on the north-facing slope of Big Bear Valley is presently in a high departure state from normal levels. The suppression of

fires and the absence of removing fuels have created an environment that, when a fire occurs, will be difficult to control and that all types of vegetation within the areas which are in a high departure state are likely to ignite and burn.

Section 5.0 Present Forest-wide Conditions

A large portion of the Big Bear Valley Wildland Urban Interface has not burned in well over 105 years and has missed approximately four fire intervals in the conifer or mixed conifer vegetation structure. According to the California Department of Forestry (FRAP) data derived from the United States Forest Service material, 42% of the Big Bear Valley Wildland Urban Interface is a Fire Regime I; 47% is a Fire Regime III; and 3% is in Fire Regime IV. For definitions of a fire regime, please refer to the Definitions section at the end of the document. Even without the drought and tree mortality issues, this is considered high fire hazard conditions with old decadent brush, heavy fuel loadings, and over-densification of trees that have not been comprehensively treated for a number of years. Although the Grand Prix and Old Fires were large fires, 70% of the fires burned in chaparral and affected only 3 to 4% of the areas with timber, leaving a large part of the forest unburned.

Map 5.0 Old fire and Grand Prix Fire Boundary

The records of large fires in the San Bernardino National Forest over the last 105 years indicate that no large fires (those fires greater than 300 acres) have occurred within Big Bear Valley, the heart of the Big Bear Valley Wildland Urban Interface. Table 5.0 indicates the approximate decade of each fire that has occurred in the last hundred and five years, the number of large fires over the last century, the approximate average size, and the total acreage burnt per decade. With this information, one could conclude that the infrequency of large fires has made the Big Bear Valley susceptible to a potential catastrophic fire.

The increase mean fire acreage per decade is one indication of the causal relationship of increasing fuel loading causing greater fire intensity which leads to difficulty in extinguishing the fires. Although intensity does not always equate to size, it does equate to the destructive ability that even smaller fires can cause damage. Evidence of a smaller fire (100 acres) in the Baldwin Lake area in the mid 1980s caused numerous homes to be destroyed but was not large enough to be included in Table 5.0. Over the last 25 years, no large fires have occurred in the Big Bear Valley. The reason for this could be a result of the introduction of aircraft, better firefighting equipment, an emphasis on increased coordination, and/or fire suppression training. Whatever the reason, it could be said it s because our firefighters apply effective modern tactics and strategies.

Table 5.0 – Big Bear Valley (WUI) Fire History from 1900 to 2004

Decade	Number of Fires	Total Acres	Mean Acres/Fire
1900-1919	13	1,586	122
1920-1939	2	1,463	732
1940-1959	13	18,181	1,399
1960-1979	21	60,105	2862
1980-1999	23	78,625	3,418
2000-	1	16	16

Section 5.1 What is the fire and fuels problem?

Recent history has seen an increasing trend of record breaking wildfires on public forests and grasslands nationwide. In 2002, wildfires on our nation s forest burned 7.2 million acres in seven western states.

Locally in 2003, the Old Fire and the Grand Prix fire combined to create a conflagration of approximately 150,729 acres. It is estimated that only 3-4% of the Old Fire burned in timber stand concentration. Although this can be seen as positive, it can and does mean that within the Big Bear Valley Wildland Urban Interface, fire, a natural occurrence as a result of lightening strikes in past generations and used by Native Americans, has been significantly inhibited from naturally burning away fuels such as pine needles, twigs, brush, saplings, branches, snags, and down dead trees that accumulate on the forest floor. These burnable fuels have not been removed in decades. This inhibition is most likely a result of aggressive fire suppression efforts.

Just as important in any discussion concerning accumulation of fuels is the prohibition to harvest live, over-dense tree stands in the forest. An example of this is indicated in the South Big Bear Fuels Reduction Reports Environmental Assessment that indicates Many of the low-departure stands that are on dry, low productivity sites were heavily logged in the 1960s. Prohibiting consumptive use of a renewable natural resource can/does contribute to the changes in the historic vegetation structure. The build-up and accumulation of unnatural historical vegetation structure ultimately has an accumulated effect on the forest health causing existing live vegetation to compete for the same nutrients and water. An over-dense vegetation structure reduces the vegetation s ability to resist disease and insects like the bark beetle. Thus, an increase in the forests vegetation mortality rate can be predicted as well as an increase in insects and bark beetles.

Over-densification of the vegetation effectuates an increase in the populations of insects including bark beetles and other disease agents beyond historic levels. Thus unnatural accumulation of dead fuels over time has occurred to the point that the condition class within the WUI is significantly modified. It is estimated that in some areas, 50 to 120 tons of burnable fuel per acre has been left to accumulate. In accordance with the United States Forest Service, the forest within the Big Bear Valley Wildland Urban Interface has been "significantly altered from the normal range" (see Table 5.1). The Big Bear Valley communities are now listed in the Federal Register as communities at "high risk".

The most extensive and serious problem related to health of the national forests in the interior west is the over-accumulation of vegetation, which has caused an increasing number of large, intense, and many times uncontrollable and catastrophically destructive fires. All vegetation, whether live or dead, serve as fuel for fires. In a natural state, a Jeffery/ponderosa pine tree forest consists of open stands of large diameter older trees with very little undergrowth. The burnable fuel in this type of forest is minimal. In contrast, the forest within the Big Bear Valley Wildland Urban Interface today consists of burnable fuels that are four times the historic levels.

There is new tree mortality in multiple areas, but for the most part, it is within affected areas observed in 2004. Many of the older standing dead trees (3 months or more) are losing needles. Trees that have recently died are still holding onto their needles, and some green trees that appear to be alive are, in fact, dead. You can see this across much of the forest. North facing slopes where we normally find higher live fuel moistures are experiencing high mortality. It would be best to describe the timber mortality as standing heavy slash or a "Vertical Fuel Model 13". The Fuel Model Matrix identifies per management unit the amount in acres of the various fuel models within the Big Bear Wildland Urban Interface. Combined, the standing and down dead fuel loadings could equate to several hundred tons of fuel per acre.

Table 5.1 Big Bear Valley Wildland Urban Interface Fire Regime and Condition Class Percentage by Management Unit*

Management Units	Fire Regime**	Condition Class 1 %	Condition Class 2 %	Condition Class 3 %	Condition Class 9 %
Baldwin Lake/ Erwin Lake	I/III	4	50	27	19%
Lone Valley	I/III/IV	6	82	12	0
Sugarloaf	I/III	15	41	29	15
Moonridge	I/III	12	8	42	38
Big Bear City	I/III	12	34	10	44
Big Bear Lake	I/III	6	7	60	27
Fawnskin	I/III	10	54	31	5
Gray's Peak	I/III	13	11	72	4
Mill Creek	I/III	19	24	55	2
Holcomb	I/III	12	56	30	2
Santa Ana	I/II/III	18	44	37	1

***Fire Regime and Condition Class information provided by the California Department of Forestry, Fire Resource and Assistance Program (FRAP)**

****The Fire Regime in Table 5.1 is identifies the primary class in forested areas.**

Section 5.2 Air Quality

The South Coast Air Quality Management District (SCAQMD) is the regulatory agency that monitors air quality within the BBVWUI. Any and all approvals on prescriptive burns would require approval from the SCAQMD.

Section 5.3 Natural Resource Management

The use of forest products has seen a decline. The last large scale local mill closed in the early 1980s after environmental constraints reduced the supply of timber to the point that it was no longer economically viable to continue the milling operation. The harvesting of the wood/timber from private property was the only remaining option. Small boutique businesses use wood for woodcarvings and firewood, but for the most part, up until 2000, the use of wood /timber was limited. Issuance of a permit for harvesting Christmas trees is not allowed in spite of an overly dense forest of small trees.

In the San Bernardino National Forest, the drought and bark beetle infestation left an estimated 13 million trees across the forest dead - trees of all sizes and age. There were insufficient harvesting companies to remove the trees. Local governments were limited and perplexed on what to do with the trees. Many trees were not useful due to type, size, and condition after they died. Burying or leaving them in their natural felled position to litter the forest floor was and remains a vital economic solution to some, but it does little to reduce the

burnable fuels in our forest. Local governments purchased incinerators, chippers, and initially helped fund small sawmills. Private companies looked into biomass electric generation but were frustrated by federal & state bureaucracy, regulations, and/or red tape. To operate such a process would require a guarantee from public land managers to provide a sustainable supply of wood biomass from public lands. San Bernardino National Forest representatives met with several biomass co-generation firms early in the tree mortality event. One failed to produce a business plan as was needed to evaluate their proposal; another indicated that they needed a guaranteed biomass stream of such quantity and duration that extensive and costly environmental analysis would be required, and they appear to have lost interest in committing the level of investment necessary to pursue the matter further.

Meanwhile, the wood has been backing up in firewood businesses in and around Big Bear. Some businesses have been offering free wood and chips just to get rid of them. Small milling operations have begun to operate. The Inland Empire Council for Boy Scouts operates a small mill at Camp Emerson in Idyllwild. Milling operations for wood pallets and crates have used some portions of the forest products. Some trees are shipped to Terra Bella in central California for milling. Some material is shipped to a co-generation facility in Thermal, California as long as shipping is provided.

Privately in and around Big Bear, tree trimmings and slash are part of the solid waste stream. Little is done to separate this biomass from the rest of the trash and use it in a beneficial manner. Biomass continues to be a key community issue to overcome. There is a need for both public land stewards and private landowners to work together with business interests to seek viable and sustainable solutions for the reuse of biomass material. Help is on the horizon with the completion of the "Southern California Biomass Disposal and Utilization Assessment" conducted by TSS Consultants. This report can assist Southern California agencies in developing plans to market and utilize biomass materials at a local, state, and regional level.

6.0 What is Fire Safety?

How to be ready when fire comes.

6.1 Before Fire

6.1.1 Defensible Space

Creating defensible space is one of the two most important actions that a homeowner can create before a fire occurs in order to decrease the likelihood of an ignition around their home. Developing a WUI standard for defensible space that works for Big Bear Valley which meets state and local statutes as well as the vegetation landscape of the Bear

Valley intermix and is clearly enforceable remains a high priority of the Big Bear Valley Wildland Urban Interface.

6.1.1.1 Legal Requirements

Legal requirements vary within the communities of the Big Bear Valley. The use of Public Resources Code, Section 4291, applies to private lands in unincorporated areas of the Valley. Furthermore, the County of San Bernardino enforces a vegetation ordinance for use in the City of Big Bear Lake, the Big Bear City Community Services District, and in the unincorporated area of the Valley. In addition, agencies have adopted the California Fire Code, which contains Appendix II-A. Appendix II-A contains various requirements for the suppression and control of fires in a hazardous fire area. The City of Big Bear Lake has adopted a separate fire hazard abatement ordinance similar to the County ordinance in addition to the adoption of Appendix II-A.

The City of Big Bear Lake has a tree conservation ordinance that establishes certain criteria for the conservation of trees, and the Development Code grants the authority to provide thinning of overly dense trees on private properties at the time of construction.

Another consideration for Valley fire agencies is to adopt the Wildland Urban Interface Code published by the International Code Council or adopt National Fire Protection Association Standards.

The County of San Bernardino Fire Department has adopted the 1991 edition of the Uniform Fire Code as compared to the Big Bear City CSD Fire Department and the City of Big Bear Lake Fire Department that have adopted the 2001 edition of the Uniform Fire Code as amended by the State of California. When assessing the significance of San Bernardino County not adopting the most current code, one can easily see that the layering of other County or State adopted laws and regulations fill the gap created by their political bodies' denial of the adoption of the 1994, 1997, and 2000 editions of the Uniform Fire Code, yet it complicates the process at the enforcement level. Thus it slows down the approval processes for new and existing construction, fosters obsolescence, and creates difficulty approving technological advancements.

In 1995, the enactment of certain state laws required the California Department of Forestry to identify lands that are considered as a "Very High Fire Hazard Severity Zone". The Big Bear City CSD Fire Department adopted by ordinance the "Very High Fire Hazard Severity Zone" criteria. This is in contrast to the Big Bear Lake Fire Department, which did not adopt the criteria.

Furthermore, the Pubic Resources Code was recently modified to require 100 feet clearances around structures.

The California Office of the State Fire Marshal has developed a series of guidelines for agencies to use within a hazardous fire area.

In August 2001, the Federal Register listed only the communities of Big Bear City, an unincorporated area and the incorporated community of the City of Big Bear Lake in its list of communities at "high risk". Communities such as Baldwin Lake, Fawnskin, and Erwin Lake were not specifically identified, yet meet the criteria for inclusion as a community at risk.

This emphasizes the layering of laws and regulations that frustrate agencies and departments when talking to the public about creating defensible space. The challenge for the BBVWUI is to identify differences in various regulations and implement practical solutions.

6.1.1.2 Fire Resistant Landscaping

The Big Bear Valley fire agencies have begun aggressively communicating the need for private property owners to reduce the overgrown vegetation maintained on properties within the Big Bear Valley. Mass media campaigns with Valley fire agencies and the Big Bear Valley Fire Safe Council have begun informing property owners what they need to do to create defensible space. Fire resistant landscaping starts with the elimination of pine needles, leaves, and dead vegetation. Limbing up trees and bushes as well as removing over-dense trees is all part of creating a fire resistant landscape.

With the high density of structures, small lot sizes, and properties with side yard setbacks being a minimum of three feet for older subdivided properties, utilizing standard printed materials that show houses with clearances around them up to 100 feet, creates unique challenges when communicating "how to create fire resistant landscaping" and defensible space guidelines. The primary reason is that intermix landscape preprinted universally used brochures do not fit the communities of the Big Bear Valley.

Valley officials and community stakeholders are working on developing materials that explain "how to create fire resistant landscaping" and defensible space that meets an acceptable standard. Since all live or dead vegetation will burn, officials are guarded to use plants that may be the "lesser of two evils" when recommending plants in and around structures.

6.1.1.3 Separation Requirements vs. Vegetation

Currently, the fire agencies of the Big Bear Valley utilize the requirements within the California Fire Code and/or the Public Resources Code 4291 to assure proper vegetation clearance from structures or hazardous materials. The following requirements in Table 6.1 are some of the spacing requirements required by law.

The County of San Bernardino and the Big Bear City Community Services District have adopted standards on distances from structures for firewood. The County's Fire Safety Overlay requirements establish a 30 feet minimum separation from structures while the CSD requires 20 feet separation. Yet neither of these requirements is strictly enforced. The City of Big Bear Lake has no specific requirement for firewood separation from structures.

Table 6.1 List of Separation Requirements from Vegetation

Reference Section	Clearance by Type	Separation Distance
Section 7904.2.5.4.1 CFC	Class I Class II Liquids	50 ft. min.
Section 16 CFC Clearance of Brush CFC	Flammable vegetation Combustible vegetation	30 ft. to 100 ft.
Section 16 II A CFC	Remove Limbs	10 ft. from chimney outlet
Section 17 II A CFC	Brush clearance from roadways	10 ft. min.
Section 15 II A CFC	Clearance around electrical lines	10 ft. min.
Section 8209 CFC - LPG	Clearance from LPG tank/ containers from combustibles	10 ft. min.
Section 8003.1.12 CFC Hazardous Materials	Clearance of vegetation from hazardous materials outdoor storage area or tanks.	30 ft. min.
Section 3008.4 CFC Storage of Wood Products	Clearance of vegetation	As determined by the Chief
Unincorporated Areas Fire Safety Overlay Section 85.020220	Minimum setback requirement from property line. Minimum distance between buildings. Minimum setback from National Forest boundaries.	Minimum 5 ft. Minimum 10 ft. Minimum 30 ft.

6.1.1.4 Recommended Building Materials/Fire Wise Construction

The current building material used to construct the majority of the buildings within the Big Bear Valley Wildland Urban Interface is wood frame construction with exterior surfaces being of T-111, masonite, exterior wood facade, vertical wood shake, shingle, etc. The building requirements are different in the City versus the County unincorporated area. The Uniform Building Code currently used is the 2001 California Building Code. It is adopted Statewide. The County has enacted a more restrictive development code for areas in a high fire hazard area. These high fire hazard requirements have been utilized since 1989 and are applicable throughout the unincorporated areas, including the CSD. These requirements include the installation of Class A roof coverings, the elimination of eave vents, multi-pane windows, and upgraded roofing requirements to meet current standards when replacing

existing roofing material and/or constructing a new addition. The City of Big Bear Lake has similar standards in place as well.

Yet, none of the agencies have adopted a "future effect" clause that would mandate the replacement of organic shake shingle roof coverings to be replaced by an established future date. Rather they have opted to allow a natural attrition process and/or encouragement from the insurance industry to be the motivational factors behind removing the organic or shake shingle roof material.

The two most important pre-disaster mitigation actions that can be accomplished that have the greatest ability to reduce structural ignitability is (1) the removal of existing shake shingle roofs; and (2) the creation of defensible space. Dwellings within communities at very high risk to a wildfire that have organic or shake shingle roofs subject the whole community to a continual threat.

The most compelling evidence documented on the effectiveness of non-combustible roofing versus shake shingle roofs is explained in an article titled, "Preventing Disaster" by Jack Cohen, published in the Journal of Forestry. Cohen states that effectiveness of a non-flammable roof versus shake shingle is approximately 3.68 times more effective at preventing structural ignition. In other words, 368% less likely that damage, losses, and casualties will occur in dwellings without shake shingle roofs.

6.1.2 Water Sources

The available types of water sources are lakes, streams, ponds, public water distribution systems, private wells, storage tanks, and water tenders. Generally, these sources are all utilized during a wildland fire. Non-hydrant areas in the San Bernardino County area are allowed to install a 3,000 gallons water tank or an FX type fire sprinkler system. These systems will suppress fire in an interior origin; however, long-range consideration should be given to providing water storage capacity and installation of water mains and fire hydrants in existing subdivisions for wildland fire scenarios.

6.1.3 Community Emergency Response Teams (CERT)

See Page 23.

6.1.4 Personal Tools, Equipment, and Fire Protection Clothing

Fire protection clothing is generally available only to fire department personnel. A small cache of old fire protection clothing is maintained. Setting aside a significant cache for appropriately trained volunteers is recommended. Until this is accomplished, alternative equipment may be purchased at local hardware stores.

A preliminary equipment list may include rakes, shovels, power tools, gloves, hardhats, and breathing masks. Clothing that will provide some semblance of protection is long sleeved cotton shirts, cotton pants, boots, gloves, etc., all of which would most likely be brought from home by individuals.

A list should be developed as part of the emergency preparedness plan for implementation during emergencies.

Section 6.2 Emergency Communication

Currently, the alarm dispatch system to each station is the only available method of receiving alarm notification for both the Big Bear Lake and the Big Bear City Fire Departments. The alarm notification is 100% reliant on a proper working telephone system. At this time, the activation of the alarm is sent from dispatch (approximately 80 miles away) via telephone lines due to lack of a repeater system in place to a local alarm activation point which then is broadcast through the airwaves to a tone activated fire station.

There is need to have two alarm dispatch circuits to each fire station. For many years, the Insurance Services Office statements have identified a need to add a second circuit. Furthermore, NFPA 1221 states that any jurisdiction that receives more than 730 alarms per year shall provide two separate and dedicated dispatch circuits where the failure of one circuit does not affect the operation of the other. The upgrade to the current dispatch/communication system is underway.

Section 6.3 Evacuation / reentry Plans

A critical component of an emergency fire scenario is evacuation. The legal authority for evacuations is the San Bernardino County Sheriff's Department. A practice instituted by policy for any fire response is the active deployment of law enforcement personnel during any fire scenario within the mountain communities of the San Bernardino National Forest. The latest edition of the evacuation/reentry plan is dated June 2005.

Section 6.4 Mitigation Strategy Action Plan

The Big Bear Valley Wildland Urban Interface is comprised of eleven management units. Within each management unit and across the WUI, various priorities have been identified that require implementation to mitigate or prescribe the particular remedy that is most appropriate for the specific condition that one is trying to achieve.

Priorities in each management unit are as identified in the Plan's Purpose & Statement and herein reiterated.

General Purpose

- Ensure the long-term economic stability of the communities by reducing the fire threat risk from very high to moderate/low.
- Identify lands private, public, forested, urbanized or otherwise that, if treated, would reduce the potential fire impact to communities and structures in and around the Big Bear Valley. This is commonly referred to as the Wildland Urban Interface (WUI) zone.
- Implement fuel reduction measures to assure continuing and ongoing safety of the Big Bear Valley watershed and recharge aquifers.
- Identify high valued areas that, if absent from trees, would have a detrimental effect on the appearance and ambiance of the communities of Big Bear Valley. Propose and implement measures to assure the long-term survivability of these areas.
- Identify and support new markets that collectively, with public and private partnerships, assure that the forest vegetation and trees that are removed go to sources that have a beneficial use, i.e., lumber, biomass chips for landscaping and erosion control, and/or energy.

Buildings

- Review, evaluate, and modify fire wise building codes and fire protection laws for private landowners/builders to reduce home ignitions.
- Review, evaluate, and make recommendation for a fuel reduction and vegetation management/landscape ordinance.
- Design and develop a list of building standards that existing homeowners can voluntarily install to reduce the vulnerability of their homes.

Healthy Forest needs

- Develop and prioritize fuel treatment programs on National Forest lands using Forest Service practices within the Big Bear Valley Wildland Urban Interface. For fuel treatment prescriptions on private lands, individuals are required to follow Title 14, State Forest Practice Act.
- Implement treatments within the Big Bear Valley WUI to revitalize forest health on both public and private lands. Treatments should promote a mixed age class stand with healthy stocking levels that supports multiple forest resource values such as forest products, esthetics, water, wildlife, recreation, etc.
- Support the reintroduction of prescriptive and controlled fire into the ecosystem of the Big Bear Valley Wildland Urban Interface on both public and private lands.
- Incorporate as much as possible a “do more with less” concept by privatizing “off budget” management and treatment prescriptions of the forest.

Section 6.5 Mitigation Goal

The implementation of the Plan's goals and objectives may in fact take a village to implement. It will be incumbent on all of us to do our share. Cooperation of governmental agencies, fire safe councils, watershed councils, public/private partnerships, the Big Bear Valley Mountain Mutual Aid Association, National Resource Conservation Service, non-governmental organizations, homeowners' associations, and general citizenry will be necessary in order to reduce the threat of a wildfire. The following are some of the ongoing projects that various organizations have done or are doing to make the BBBWUI a more fire wise WUI.

Table 6.5 CWPP PROJECTS MATRIX
March 2006

Project Description	Responsible Party	Acres Under Analysis	Thinning	Brushing	Agency Involvement	Proposed Timelines*	Estimated Cost	Management Unit Name	Projects Status
		ACRES							
Barton Flats	USFS	3947				2005	TBD		
BB Healthy Forest Treatment #1	USFS	492				2005	TBD		
BB Healthy Forest Treatment #2	USFS	670				2005	TBD		
BB Healthy Forest Treatment #3	USFS	3037				2005	TBD		
BB Interface	USFS	780				2005	TBD		
BB Skyline 1	USFS	534				2005	TBD		
BB Skyline 2	USFS	86				2005	TBD		
BB Tract South	USFS	66				2005	TBD		
BB Tract Center	USFS	104				2005	TBD		
BB Tract North	USFS	91				2005	TBD		
Bear Mountain	USFS	917				2005	TBD		
Fawnskin NW	USFS	927				2006	TBD		
Glory Ridge Fuels Reduction	USFS	998				2005	TBD		
Lakeview West	USFS	122				2005	TBD		
Lakeview East	USFS	50				2005	TBD		
Metcalf	USFS	183				2005	TBD		
Pine Knot	USFS	34				2005	TBD		
Snow Summit	USFS	611				2005	TBD		
Willow Glen	USFS	16				2006	TBD		
Bertha Ridge	USFS	3333				2006	TBD		
Childrens Forest	USFS	197				2006	TBD		

Table 6.5 CWPP PROJECTS MATRIX
March 2006

	Responsible Party	Acres Under Analysis	Thinning	Brushing	Agency Involvement	Proposed Timelines*	Estimated Cost	Management Unit Name	Projects Status
Lake Erwin & Lake Williams	USFS	2764				2006	TBD		
Nelson Ridge & Baldwin Lake	USFS	1430				2006	TBD		
Pinyon Ironwood Fuelwood Sale	USFS	539				2006	TBD		
Santa Ana / Clarks Grade Fuel Modification	USFS	1500				2006	TBD		
Sawmill	USFS	293				2006	TBD		
Section 17	USFS	522				2007	TBD		
Bluff Lake	USFS	1272				2007	TBD		
Grays Peak	USFS	2801				2007	TBD		
Holcomb West	USFS	2407				2007	TBD		
Poligue Canyon	USFS	39				2008	TBD		
Heart Bar	USFS	4214				2008	TBD		
Snowslide	USFS	7243				2009	TBD		
Delmar Mountain	USFS	2839				2009	TBD		
Holcomb Valley	USFS	3472				2009	TBD		
Onyx Peak	USFS	975				2009	TBD		
Wildhorse	USFS	5099				2010	TBD		
Arrasre Flat	USFS	7722				2010	TBD		
Santa Ana River	USFS	4186				2008	TBD		
Public Education									
Valley-wide Public Education Program	BBLFD					2005			
Big Bear City Fire Departmnet						2005			
Fire Safe Council						2005			

Table 6.5 CWPP PROJECTS MATRIX
March 2006

	Responsible Party	Acres Under Analysis	Thinning	Brushing	Agency Involvement	Proposed Timelines*	Estimated Cost	Management Unit Name	Projects Status
Thinning Projects									
Bear Valley School District	BLFD, BBC, CD					2005			
Valley-wide Vegetation Abatement	BLFD, BBC, SBC					2005			
Shore/Big Bear Blvd.	BBC	Yes/ 15		BBC,BBL SCFD		C	14,000		C
Shore/Big Bear Blvd.	BBC	/15		BBC,BBL SCFD		6/7/2007	Unknown		Marked
Shay Road	BBC	/ 5	Yes	BBC,BBL SCFD		C	9,000		C
Peery Reservoir	BBC/BBL	Yes/1	Yes	BBC,BBL SCFD		C	6,000		C
Structure Ignitability Projects									
Structural Ignitibility Demonstration	BBLFD					2005			
Apply for grant to replace shake shingle/orgainic material on roofs	BVFSC, BBC, BBL								Ongoing
Fuel Modification Projects									
Condition of Approval - all new developments will be required to submit a fuel modification plan	BBC,SBCFD,BBL	Yes	Yes	N/A	Ongoing				
Infrastructure Improvement Projects									
Valley-wide siren system that is intended to notify the public to tune into local radio or TV stations in order to receive information of public concerns including fires, earthquakes, or other emergency situations	BBLFD/BBCFD								
Fiber optic installed which increases reliablity of the communications link with the Valley's dispatch center in Victorville	BBLFD								

Table 6.5 CWPP PROJECTS MATRIX
March 2006

	Responsible Party	Acres Under Analysis	Thinning	Brushing	Agency Involvement	Proposed Timelines*	Estimated Cost	Management Unit Name	Projects Status
A portion of th Valley's radio communications are currently via telephone lines. For added reliability, BBLFD received a grant to install a redundant radio repeater system which would operate independent of the fiber optic system.	BBLFD								
Industrial Resource Management									
Forest Products Utilization									
Valley-wide Chipper Days	FSC					2004/06			
Property owners list for chipped material									

Table 6.5 CWPP PROJECTS MATRIX
March 2006

	Responsible Party	Acres Under Analysis	Thinning	Brushing	Agency Involvement	Proposed Timelines*	Estimated Cost	Management Unit Name	Projects Status
Slash/Biomass Disposal									
Apply for grant assistance homeowners' vegetation removal	BBL	Yes	Yes		BBLFD				
High Value Area Projected									
Spray protection for 1,000 trees	USFS								C
Seek funding for spraying high valued areas	BBLFD, BBCFD, BBVFSC								
Fire Safety Inspection Program									
A time of a new construction - an inspection is conducted, trees marked, and direction is given to limb up trees and bushes by final	BBLFD	Yes	Yes			2005			
All new construction must comply with requirements in Fire Safety Overlay #1 San Bernardino County Development Code	BBCFD, SBCFD								

Table 6.5 CWPP PROJECTS MATRIX
March 2006

	Responsible Party	Acres Under Analysis	Thinning	Brushing	Agency Involvement	Proposed Timelines*	Estimated Cost	Management Unit Name	Projects Status
All new construction must comply with BBCCSD Ordinance 212 - directs the Fire Chief to require fire sprinklers to mitigate lack of fire flow	BBC				BBC				

***The proposed timelines herein are subject to change based upon compliance with the National Environmental Policy Act and/or available funding.**

Section 6.6 Current Projects Prioritization Process

Projects within all management units should follow the goals and objectives of the Big Bear Valley Community Wildfire Protection Plan. Funding, responsible legal authority, complexity of the projects, and proposed length of projects will arguably be the more determining factor in developing and implementing projects on an ongoing basis.

Generally, agencies, organizations, and individuals should meet quarterly to discuss the projects that are planned or being implemented to reduce overlap and foster an environment of cooperation.

If a proposed project/plan is within a political subdivision or is to be utilized within a political subdivision, rather than going through a prioritization process, approval from only that specific governing board would be required for the project or plan to move forward.

Proposed fuel treatment projects on federal lands must follow National Environmental Policy Act (NEPA) guidelines. Each agency/individual will have their own ability to comment pro or con on various upcoming projects as they are proposed.

Fuel reduction projects on private properties should follow vegetation reduction practices established by law within that particular political subdivision and the California State Forest Practices Law. An environmental review may or may not be required.

Those projects that could be utilized within all or some management units would require approval from the organization's board that supports the project and concurrence by possible affected political subdivisions, if any exist.

Big Bear Valley agencies within the Big Bear Valley Wildland Urban Interface shall collaborate on planning and operations of prescriptive burning within the BBVWUI. This is for both private and public land prescription. Campfires, stoves, barbecues or permitted fires are excluded from this requirement.

Section 7.0
Big Bear Valley Fire Protection Plan Recommendations

Section 7.1 Mitigation measure 1

Big Bear Valley Fire Protection Plan

- Continue to refine, update, and circulate the Big Bear Valley Community Wildfire Protection Plan on an annual basis between the Sheriff's Department, fire departments, Fire Safe Council, governmental agencies, and other appropriate public stakeholders. As a common resource, the Community Wildfire Protection Plan will help local and federal government agencies:

- Prioritize and coordinate mitigation treatments on private/public lands to reduce fire risks and promote biodiversity.
- Provide decision-making data for the stakeholders.
- Identify resource gaps.
- Protect and manage community "values at risk" such as residences, watersheds, archeological or historic sites, view corridors, recreation resources, and wildlife habitat.
- Provide common reference and direction for fire suppression effort between fire districts and federal fire management officers.

Section 7.2 Mitigation measure 2

Develop and Sustain a General Public Education Campaign and Concentrate Special Efforts in Areas Identified as High Threat

Expanding the use of public education tools already in place is an immediate action step that can be taken. Publications and videos are available and can be found via the Internet.

Additional steps may include:

- Development of an educational presentation booth to be used at various public events. Such a display may include photo documentation of good mitigation work examples and graphic illustrations of "fire wise" homes.
- Place feature articles in local newspapers dealing with wildfire preparedness to maintain a high level of fire awareness at the community level on a regular basis.
- Provide information to property owners about the need for fire wise construction standards, laws, and codes.
- Through public education and enforcement efforts, maintain ongoing practices of assuring the removal of overgrown vegetation and fuel loading on private lands. Emphasize defensible space clearing on private lands within the Big Bear Valley.
- Monitor, report, and educate citizenry on changes in the biodiversity evidenced within the Big Bear Valley Wildland Urban Interface.
- Seek as needed assistance from the Natural Resource Conservation Service on monitoring and implementing ways to educate citizenry on methods and techniques to help reduce soil erosion.
- Informational briefs and videos can be broadcast over the community closed circuit television station.
- Integrate "fire wise" education into school curriculum. Involve local clubs such as Boy Scouts, Girl Scouts, school based clubs, etc.
- Work with homeowner associations, builders, realtors, and a door-to-door outreach program to individual landowners in an effort to jumpstart word-of-mouth community networking.
- Develop highly visible ongoing demonstration projects.

Section 7.3 Mitigation measure 3

Develop measures to reduce fire hazards in future developments

- Review, evaluate, and modify fire wise building codes and fire protection laws unilaterally for private landowners/builders to reduce home ignitions.
- Review, evaluate, and make recommendation for a fuel reduction and vegetation management/landscape ordinance.
- Design and develop a list of building standards that existing homeowners can voluntarily install to reduce the vulnerability of their homes.
- Adopt a future effect clause for the replacement of organic or shake shingle roofs. Seek funding sources to help mitigate cost.
- Adopt an ordinance that mandates the development of a landscape plan on all new dwellings.
- Implement a Wildfire Hazard Rating Assessment for each proposed management unit of the WUI outlining mitigation measures to be undertaken across the entire subdivision.
- Work with fire departments, plan checkers, and building inspectors to ensure driveway requirements are being met.
- A standardized "Defensible Space Assessment" outlining mitigation measures should be required for individual subdivision lots.
- Adopt a standard to create a minimum setback of five feet and/or ten feet separation between dwellings or provide other alternative mitigation measures.
- Work with water purveyors to assure that the required fire flow of 1,500 gpm is provided to all single and two family dwellings.

Section 7.4 Mitigation measure 4

Create a Mechanism for the Oversight and Management of the Big Bear Valley Wildfire Protection Plan

Some possibilities for accomplishing this duty may include: continued oversight through the Fire Safe Council, fire departments, and City/County Planning Commissions.

Some of the oversight functions may include, but not be limited to:

- Administering a sustained public education strategy.
- Administration and follow-up on grant applications.
- Coordination between City/County/fire departments.
- A contact point for coordination with federal agencies.
- Tracking of equipment and training needs.
- Administering/coordinating post fire rehabilitation efforts such as damage assessment, erosion control, reseeding, weed control, etc.

Section 7.5 Mitigation measure 5

- Ensure the long-term economic stability of the communities by reducing the fire threat from very high to moderate/low.

Section 7.6 Mitigation measure 6

- Identify forestlands, private and public, developed and otherwise that, if treated, would reduce the potential impact to existing communities and structures in and around the Big Bear Valley. This is commonly referred to as the Wildland Urban Interface Zone.

Section 7.7 Mitigation measure 7

Continue Long-Range Strategic Planning to Anticipate and Prepare for Future Emergency Preparedness Needs

- Seek out and plan for funding the construction of a dedicated emergency operations center for use in emergencies.
- Seek out and plan funding for an emergency operations center manager/coordinator with job duties to promote and train Certified Emergency Response Teams (CERT) volunteers.
- A part of preparing for an emergency is to ensure that equipment is reliable. In accordance with NFPA 1901, replace all first run equipment that was manufactured prior to 1979.
- Work with local public works departments to identify roads that are deficient. Adopt a plan to modify and upgrade roads where practical.
- As part of the fire safety inspector program, identify propane tanks that do not have hold-downs. Enforce existing standards on all propane tanks in the WUI.
- When funding is available, provide a least two separate and dedicated dispatch circuits in compliance with NFPA 1221.

Section 7.8 Mitigation measure 8

- Continue the annual fuel reduction measures on private properties within the Big Bear Valley.
- Implement fuel reduction measures to assure continuing and ongoing safety of the Big Bear Valley watershed and recharge aquifers. Monitor the progress of watershed change over a period of time.
- Seek sources to assist in funding a fire safety inspector program to conduct ongoing implementation of the Public Resource Code, NFPA 1144, street and address standards and defensible space guidelines.

Section 7.9 Mitigation measure 9

- Identify high valued areas that, if absent from trees, would have a detrimental effect on the appearance and ambiance of the communities of the Big Bear Valley WUI. Propose and implement measures to assure the long-term survivability of these areas.

Section 7.10 Mitigation measure 10

- Work with timber harvesters and environmental groups to identify and support new markets that collectively, with public and private partnerships, assure that the forest vegetation and trees that are removed go to sources that have a beneficial use, i.e., lumber, biomass chips for landscaping & erosion control, and/or energy.

Section 7.11 Mitigation measure 11

- Work with the United States Forest Service annually to seek appropriate funding to complete fuel treatment programs on public lands.
- Incorporate as much as possible a "do more with less" concept by privatizing "off budget" management and treatment prescriptions of the forest.

Section 7.12 Mitigation measure 12

- Implement measures within Big Bear Valley Wildland Urban Interface restoring the forest to a condition resembling historic levels of fire regimes, species composition, and insects & disease agents while at the same time assure the removal of dead, dying or diseased trees. Reduce the tree density by removing over-dense trees of any size and the vegetation undergrowth that is necessary to achieve and maintain fire intensity at moderate to low levels.
- Collaborate with the United States Forest Service to ensure the development of the shaded fuel breaks are completed around all the communities of the Big Bear Valley.

Section 7.13 Mitigation measure 13

- Support the reintroduction of prescriptive and controlled fire into the ecosystem of the BBVWUI on both public and private lands.

Section 8.0 Management Unit Identification

See Map 2.2.2 Management Unit Map.

Management Unit 1 (Baldwin Lake area, includes Lake Williams and Erwin Lake)*

Fuel Type in Acres				Threat Level	Fire Regime I,III,IV	Condition Class 1/2/3/9 % by Acres
Grass Types 1-3	Chaparral Types 4-7	Timber Types 8-10	Slash Types 11-13	Extreme		
2882.81	3814.08	806.16			I/III**	3/50/26/19

***Fire Regime Condition Class and Threat Level, information provided by the California Department of Forestry, Fire Resource and Assistance Program (FRAP). The threat level was determined from the "Threat to People" 2003 Map. Discussions of the appropriate use of this map were inconclusive and therefore its use was included.**

**** Less than 2% of the acreage in this management unit consists of barren, water or urban lands.**

- **Fuel Type** – Juniper and pinion woodland with sagebrush, rabbit brush, and cheat grass understory.
- **Treatment** – On public lands, the USFS will identify appropriate prescription to be conducted and collaborate with local government and the public to ensure the ongoing objects of this Plan and healthy forest initiative are met. Prescribed fire possible. On private properties, owners and the agency having jurisdiction will ensure the ongoing implementation of fuel reduction meets appropriate state, county, and local requirements.
- **Who will accomplish work?** – Natural Resource Conservation Service, San Bernardino County Code Enforcement (Weed Abatement), San Bernardino County Fire Department, San Bernardino County Public Works Department, homeowners, Big Bear Lake Fire Department, Big Bear City Fire Department, and USFS.

Management Unit 2 (Lone Valley)*

Fuel Type in Acres				Threat Level	Fire Regime I,III,IV	Condition Class 1/2/3/9 % by Acres
Grass Types 1-3	Chaparral Types 4-7	Timber Types 8-10	Slash Types 11-13	Extreme to Very High		
3289.99	15565.34	2383.58			I/III/IV**	12/34/10/44

***Fire Regime Condition Class and Threat Level, information provided by the California Department of Forestry, Fire Resource and Assistance Program (FRAP). The threat level was determined from the "Threat to People" 2003 Map. Discussions of the appropriate use of this map were inconclusive and therefore its use was included.**

****Less than 1.0% of the acreage in this management unit consists of water, urban or barren lands.**

- **Fuel Type** –Predominate pinion woodland with sagebrush, rabbit brush, and cheat grass understory.
- **Treatment** – On public lands, the USFS will identify appropriate prescription to be conducted and collaborate with local government and the public to ensure the ongoing objects of this Plan and healthy forest initiative are met. Prescribed fire possible. On private properties, owners and the agency having jurisdiction will ensure the ongoing implementation of fuel reduction meets appropriate state, county, and local requirements.
- **Who will accomplish work?** – Natural Resource Conservation Service, San Bernardino County Code Enforcement (Weed Abatement), San Bernardino County Fire Department and San Bernardino County Public Works Department, homeowners, Big Bear Lake Fire Department, Big Bear City Fire Department, and USFS.

Management Unit 3 (Sugarloaf)*

Fuel Type in Acres				Threat Level	Fire Regime I,III,IV	Condition Class 1/2/3/9 % by Acres
Grass Types 1-3	Chaparral Types 4-7	Timber Types 8-10	Slash Types 11-13	Extreme to Very High		
88.85	228.54	7979.10			I/III**	15/41/29/15

***Fire Regime Condition Class and Threat Level, information provided by the California Department of Forestry, Fire Resource and Assistance Program (FRAP). The threat level was determined from the "Threat to People" 2003 Map. Discussions of the appropriate use of this map were inconclusive and therefore its use was included.**

****Less than 5.0 % of the acreage in this management unit consists of water or barren lands; 14.8% is urbanized.**

- **Fuel Type** – Pinion, Jeffery pine, manzanita, cheat grass understory.
- **Treatment** - On public lands, the USFS will identify appropriate prescription to be conducted and collaborate with local government and the public to ensure the ongoing objects of this Plan and healthy forest initiative are met. Prescribed fire possible. On private properties, owners and the agency having jurisdiction will ensure the ongoing implementation of fuel reduction meets appropriate state, county, and local requirements.
- **Who will accomplish work?** - Natural Resource Conservation Service, San Bernardino County Code Enforcement (Weed Abatement), San Bernardino County Fire Department and San Bernardino County Public Works Department, homeowners, Big Bear Lake Fire Department, Big Bear City Fire Department, and USFS.

Management Unit 4 (Moonridge)*

Fuel Type in Acres				Threat Level	Fire Regime I,III,IV	Condition Class 1/2/3/9 % by Acres
Grass Types 1-3	Chaparral Types 4-7	Timber Types 8-10	Slash Types 11-13	Extreme to Very High		
166.94	215.67	5928.09			I/III**	12/8/42/38

***Fire Regime Condition Class and Threat Level, information provided by the California Department of Forestry, Fire Resource and Assistance Program (FRAP). The threat level was determined from the "Threat to People" 2003 Map. Discussions of the appropriate use of this map were inconclusive and therefore its use was included.**

****Less than 2.0 % of the acreage in this management unit consists of barren or water lands; 35% is urbanized.**

- **Fuel Type** – Dense mixed conifer dominated by white fir, Jeffrey pine, and oak with a build up of ground litter and an array of various shrubs. Significant mortality of white fir and lesser mortality of Jeffrey pine.
- **Treatment** – On public lands, the USFS will identify appropriate prescription to be conducted and collaborate with local government and the public to ensure the ongoing objects of this Plan and healthy forest initiative are met. Prescribed fire possible. On private properties, owners and the agency having jurisdiction will ensure the ongoing implementation of fuel reduction meets appropriate state, county, and local requirements.
- **Who will accomplish work?** – Natural Resource Conservation Service, San Bernardino County Code Enforcement (Weed Abatement), San Bernardino County Fire Department and San Bernardino County Public Works Department, homeowners, Big Bear Lake Fire Department, Big Bear City Fire Department, and USFS.

Management Unit 5 (Big Bear City Highway 18 to WUI boundary)*

Fuel Type in Acres				Threat Level	Fire Regime I,III,IV	Condition Class 1/2/3/9 % by Acres
Grass Types 1-3	Chaparral Types 4-7	Timber Types 8-10	Slash Types 11-13	Extreme to Very High		
322.18	0.00	1641.95			I/III**	12/34/10/44

***Fire Regime Condition Class and Threat Level, information provided by the California Department of Forestry, Fire Resource and Assistance Program (FRAP). The threat level was determined from the "Threat to People" 2003 Map. Discussions of the appropriate use of this map were inconclusive and therefore its use was included.**

****Less than 3.8% of the acreage in this management unit consists of barren and water lands; 41% is considered urban.**

- **Fuel Type** – western juniper, Jeffery Pine, hardwood, woodland with sagebrush, manzanita, rabbit brush, and cheat grass understory.
- **Treatment** - On public lands, the USFS will identify appropriate prescription to be conducted and collaborate with local government and the public to ensure the ongoing objects of this Plan and healthy forest initiative are met. Prescribed fire possible. On private properties, owners and the agency having jurisdiction will ensure the ongoing implementation of fuel reduction meets appropriate state, county, and local requirements.
- **Who will accomplish work?** - Natural Resource Conservation Service, San Bernardino County Code Enforcement (Weed Abatement), San Bernardino County Fire Department and San Bernardino County Public Works Department,

homeowners, Big Bear Lake Fire Department, Big Bear City Fire Department, and USFS.

Management Unit 6 (Big Bear Lake)*

Fuel Type in Acres				Threat Level	Fire Regime I,III,IV	Condition Class 1/2/3/9 % by Acres
Grass Types 1-3	Chaparral Types 4-7	Timber Types 8-10	Slash Types 11-13	Moderate to Extreme		
51.10	346.11	2733.05			I/III**	6/7/60/27

***Fire Regime Condition Class and Threat Level, information provided by the California Department of Forestry, Fire Resource and Assistance Program (FRAP). The threat level was determined from the "Threat to People" 2003 Map. Discussions of the appropriate use of this map were inconclusive and therefore its use was included.**

****Less than 2.4% of the acreage in this management unit is water; 24% is considered urban.**

- **Fuel Type** – Moderate mixed conifer and hardwood (Jeffrey pine, white fir, and oak) with a moderate array of various shrubs. Areas with heavy surface litter
- **Treatment** – On public lands, the USFS will identify appropriate prescription to be conducted and collaborate with local government and the public to ensure the ongoing objects of this Plan and healthy forest initiative are met. Prescribed fire possible. On private properties, owners and the agency having jurisdiction will ensure the ongoing implementation of fuel reduction meets appropriate state, county, and local requirements.
- **Who will accomplish work?** – Natural Resource Conservation Service, San Bernardino County Code Enforcement (Weed Abatement), San Bernardino County Fire Department and San Bernardino County Public Works Department, homeowners, Big Bear Lake Fire Department, Big Bear City Fire Department, and USFS.

Management Unit 7 (North Boundary South to Fawnskin)*

Fuel Type in Acres				Threat Level	Fire Regime I,III,IV	Condition Class 1/2/3/9 % by Acres
Grass Types 1-3	Chaparral Types 4-7	Timber Types 8-10	Slash Types 11-13	Very High to Extreme		
108.15	401.00	5649.90			I/III**	11/54/31/5

***Fire Regime Condition Class and Threat Level, information provided by the California Department of Forestry, Fire Resource and Assistance Program (FRAP). The threat level was determined from the "Threat to People" 2003 Map. Discussions of the appropriate use of this map were inconclusive and therefore its use was included.**

****Less than 5.0 % of the acreage in this management unit consists of barren urban or water lands.**

- **Fuel Type** – moderate mixed conifer and hardwood (Jeffrey pine, western juniper, and oak) with a moderate array of various shrubs. Areas with heavy surface litter.
- **Treatment** – On public lands, the USFS will identify appropriate prescription to be conducted and collaborate with local government and the public to ensure the ongoing objects of this Plan and healthy forest initiative are met. Prescribed fire possible. On private properties, owners and the agency having jurisdiction will ensure the ongoing implementation of fuel reduction meets appropriate state, county, and local requirements.
- **Who will accomplish work?** – Natural Resource Conservation Service, San Bernardino County Code Enforcement (Weed Abatement), San Bernardino County Fire Department and San Bernardino County Public Works Department, homeowners, Big Bear Lake Fire Department, Big Bear City Fire Department, and USFS.

Management Unit 8 (USFS Lease Land) Gray's Peak (Fawnskin to Dam)*

Fuel Type in Acres				Threat Level	Fire Regime I,III,IV	Condition Class 1/2/3/9 % by Acres
Grass Types 1-3	Chaparral Types 4-7	Timber Types 8-10	Slash Types 11-13	Extreme		
24.00	917.50	3623.22			I/III**	13/11/72/4

***Fire Regime Condition Class and Threat Level, information provided by the California Department of Forestry, Fire Resource and Assistance Program (FRAP). The threat level was determined from the "Threat to People" 2003 Map. Discussions of the appropriate use of this map were inconclusive and therefore its use was included.**

****Less than 3.3 % of the acreage in this management unit consists of barren urban or water lands.**

- **Fuel Type** – moderate mixed conifer and hardwood (Jeffrey pine, white fir and oak) with a heavy array of various shrubs. Areas with moderate surface litter.
- **Treatment** – On public lands, the USFS will identify appropriate prescription to be conducted and collaborate with local government and the public to ensure the ongoing objectives of this Plan and healthy forest initiative are met. Prescribed fire possible. On private properties, owners and the agency having jurisdiction will ensure the ongoing implementation of fuel reduction meets appropriate state, county, and local requirements.
- **Who will accomplish work?** – Natural Resource Conservation Service, San Bernardino County Code Enforcement (Weed Abatement), San Bernardino County Fire Department and San Bernardino County Public Works Department, homeowners, Big Bear Lake Fire Department, Big Bear City Fire Department, and USFS.

Management Unit 9 (Mill Creek)*

Fuel Type in Acres				Threat Level	Fire Regime I,III,IV	Condition Class 1/2/3/9 % by Acres
Grass Types 1-3	Chaparral Types 4-7	Timber Types 8-10	Slash Types 11-13	Extreme		
76.66	2275.55	5776.88			I/III**	19/24/55/2

***Fire Regime Condition Class and Threat Level, information provided by the California Department of Forestry, Fire Resource and Assistance Program (FRAP). The threat level was determined from the "Threat to People" 2003 Map. Discussions of the appropriate use of this map were inconclusive and therefore its use was included.**

****Less than 3.0 % of the acreage in this management unit consists of barren urban or water lands.**

- **Fuel Type** – moderate mixed conifer and hardwood (Jeffrey pine, sugar pine, lodgepole pine, white fir, and oak) with a moderate array of various shrubs. Areas with heavy surface litter.
- **Treatment** – On public lands, the USFS will identify appropriate prescription to be conducted and collaborate with local government and the public to ensure the ongoing objects of this Plan and healthy forest initiative are met. Prescribed fire possible. On private properties, owners and the agency having jurisdiction will assure the ongoing implementation of fuel reduction meets appropriate state, county, and local requirements.
- **Who will accomplish work?** – Natural Resource Conservation Service, San Bernardino County Code Enforcement (Weed Abatement), San Bernardino County Fire Department and San Bernardino County Public Works Department, homeowners, Big Bear Lake Fire Department, Big Bear City Fire Department, and USFS.

Management Unit 10 (Holcomb)*

Fuel Type in Acres				Threat Level	Fire Regime I,III,IV	Condition Class 1/2/3/9 % by Acres
Grass Types 1-3	Chaparral Types 4-7	Timber Types 8-10	Slash Types 11-13	Very High to Extreme		
20,694	8,370	5,777			I/III**	12/56/30/2

***Fire Regime Condition Class and Threat Level, information provided by the California Department of Forestry, Fire Resource and Assistance Program (FRAP). The threat level was determined from the "Threat to People" 2003 Map. Discussions of the appropriate use of this map were inconclusive and therefore its use was included.**

****Less than 1.8 % of the acreage in this management unit consists of water, barren or urban lands.**

- **Fuel Type** – moderate mixed conifer and hardwood (Jeffrey pine, western juniper, pinion, and oak) with a moderate array of various shrubs. Areas with moderate surface litter.
- **Treatment** – On public lands, the USFS will identify appropriate prescription to be conducted and collaborate with local government and the public to ensure the ongoing objects of this Plan and healthy forest initiative are met. Prescribed fire possible. On private properties, owners and the agency having jurisdiction will ensure the ongoing implementation of fuel reduction meets appropriate state, county, and local requirements.
- **Who will accomplish work?** – Natural Resource Conservation Service, San Bernardino County Code Enforcement (Weed Abatement), San Bernardino County Fire Department and San Bernardino County Public Works Department, homeowners, Big Bear Lake Fire Department, Big Bear City Fire Department, and USFS.

Management Unit 11 (Santa Ana/Southside)*

Fuel Type in Acres				Threat Level	Fire Regime I,III,IV	Condition Class 1/2/3/9 % by Acres
Grass Types 1-3	Chaparral Types 4-7	Timber Types 8-10	Slash Types 11-13	Very High to Extreme		
2015.75	12763.11	25908.52			I/III**	18/44/37/1

***Fire Regime Condition Class and Threat Level, information provided by the California Department of Forestry, Fire Resource and Assistance Program (FRAP). The threat level was determined from the "Threat to People" 2003 Map. Discussions of the appropriate use of this map were inconclusive and therefore its use was included.**

****Less than 3.0 % of the acreage in this management unit consists of water, agriculture, barren or urban lands.**

- **Fuel Type** – moderate mixed conifer and hardwood (Jeffrey pine, white fir, and cedar hardwood) with a moderate array of various shrubs, manzanita, and willow bushes. Areas with heavy surface litter.
- **Treatment** – On public lands, the USFS will identify appropriate prescription to be conducted and collaborate with local government and the public to ensure the ongoing objects of this Plan and healthy forest initiative are met. Prescribed fire possible. On private properties, owners and the agency having jurisdiction will ensure the ongoing implementation of fuel reduction meets appropriate state, county, and local requirements.
- **Who will accomplish work?** – Natural Resource Conservation Service, San Bernardino County Code Enforcement (Weed Abatement), San Bernardino County Fire Department and San Bernardino County Public Works Department, homeowners, Big Bear Lake Fire Department, Big Bear City Fire Department, and USFS.

Appendixes

Appendix A
Big Bear Valley Wildland Urban Interface - Fuel Types Acreage

		Fuel Type 1	Fuel Type 2	Fuel Type 4	Fuel Type 5	Fuel Type 6	Fuel Type 8	Fuel Type 9	Fuel Type 10	Fuel Type 15	Fuel Type 97	Fuel Type 98	Fuel Type 99	
Mgmt. Unit No.	Big Bear Valley Wildland Urban Interface Mgmt. Units	Grass Group	Grass Under Story Open Pine	Shrub Group	Medium Brush	Pinion Juniper Sage	Timber Medium Conifer	Long Needle Conifer Hard Wood	Timber Heavy Dead Forest Litter	Desert	Agri-culture	Water	Barren	Total Acreage Per Manage-ment Unit
1	Baldwin Lk/ Erwin Lk	236.88	2645.93	392.56	3421.53	0.00	3.68	802.49	0.00	0.00	140.83	1023.52	204.58	**8872.00**
2	Lone Valley	0.00	3289.99	2174.44	13378.45	12.45	4.39	2379.19	0.00	5910.80	0.00	4.91	61.33	**27215.95**
3	Sugarloaf	43.33	45.52	219.70	1.06	7.78	18.10	7960.99	0.00	0.00	37.61	11.51	150.44	**8496.04**
4	Moonridge	108.00	0.00	210.38	30.67	20.40	0.00	5928.09	0.00	0.00	744.32	50.14	125.92	**7217.92**
5	Big Bear City	78.22	243.96	696.95	0.00	0.00	0.00	1641.94	0.00	0.00	194.88	31.81	100.77	**2988.53**
6	Big Bear Lake	42.21	8.89	246.70	46.97	52.44	0.00	2733.06	0.00	0.00	81.61	47.13	39.75	**3298.76**
7	Fawnskin	0.00	108.15	388.55	0.00	12.45	44.24	5605.67	0.00	0.00	37.91	6.15	49.81	**6252.93**
8	Gray's Peak	11.55	12.45	181.97	303.53	432.00	3.06	3620.17	0.00	0.00	23.33	10.61	29.38	**4628.05**
9	Millcreek	50.00	26.66	365.14	1865.31	45.10	33.82	5681.04	62.02	0.00	0.00	29.11	174.88	**8333.08**
10	Holcomb	1357.27	19336.96	5963.05	2146.22	260.48	8.23	17879.15	0.00	4036.37	0.00	20.45	800.01	**51808.19**
11	Santa Ana	236.22	1779.53	10639.78	1926.76	196.56	393.02	24318.49	1197.01	154.56	0.00	39.40	454.56	**41335.89**
	Total Acres	**2163.68**	**27498.04**	**21479.22**	**23120.50**	**1039.66**	**508.54**	**78550.28**	**1259.03**	**10101.73**	**1260.49**	**1274.74**	**2191.43**	**170447.34**

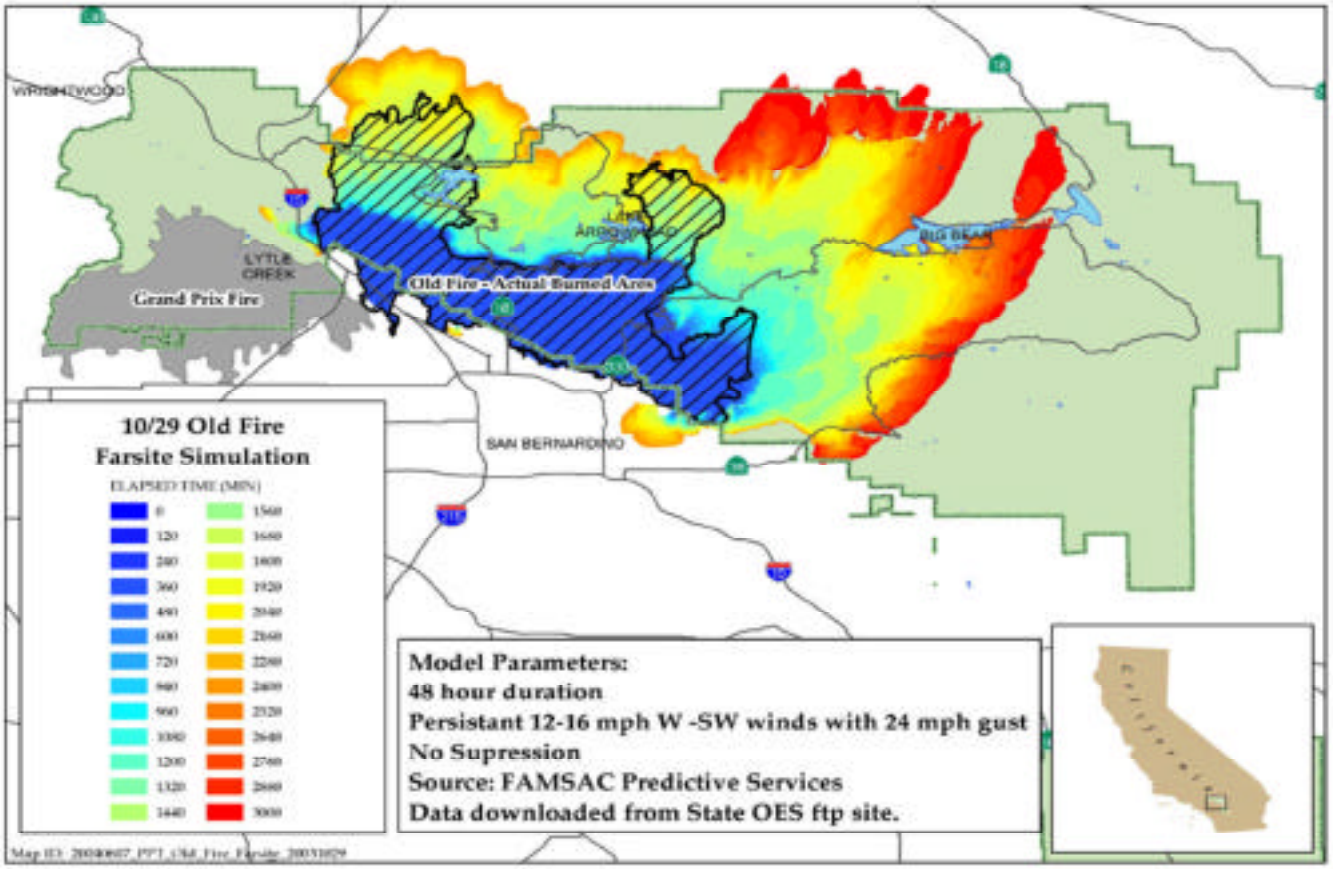
Appendix B
Big Bear Valley Wildland Urban Interface - Fuel Types Acreage by Private and Forest Lands

		Fuel Type 1	Fuel Type 2	Fuel Type 4	Fuel Type 5	Fuel Type 6	Fuel Type 8	Fuel Type 9	Fuel Type 10	Fuel Type 15	Fuel Type 97	Fuel Type 98	Fuel Type 99	
Manage-ment Unit No.	Big Bear Valley Wildland Urban Interface Management Units	Grass Group	Grass Under Story Open Pine	Shrub Group	Medium Brush	Pinion Juniper Sage	Timber Medium Conifer	Long Needle Conifer Hardwood	Timber Heavy Dead Forest Litter	Desert	Agri-culture	Water	Barren	Total Acreage Per Manage-ment Unit
1	Baldwin Lake / Erwin Lake	236.88	2645.93	392.56	3421.53	0.00	3.68	802.49	0.00	0.00	140.83	1023.52	204.58	8872.00
	Forest Land	17.92	826.01	133.53	2783.23		3.15	323.23			1.02	641.11	6.48	
	Private Land	218.96	1819.92	259.02	638.30		0.52	479.26			139.81	382.41	198.10	
		Grass Types 1 - 3			Chaparral Types 4 - 7			Timber Types 8 - 10						
		2882.81			3814.08			806.16						
2	Lone Valley	0.00	3289.99	2174.44	13378.45	12.45	4.39	2379.19	0.00	5910.80	0.00	4.91	61.33	27215.95
	Forest Land		3161.40	1747.61	12694.80	0.67	3.13	1336.43		4851.57		4.91	52.89	
	Private Land		128.59	426.83	683.65	11.78	1.26	1042.76		1059.23		0.00	8.43	
		Grass Types 1 - 3			Chaparral Types 4 - 7			Timber Types 8 - 10						
		3289.99			15565.34			2383.58						
3	Sugarloaf	43.33	45.52	219.70	1.06	7.78	18.10	7960.99	0.00	0.00	37.61	11.51	150.44	8496.04
	Forest Land	8.89	9.85	133.20	1.06	0.11	14.70	5549.20			37.61	7.03	93.33	
	Private Land	34.44	35.67	86.50	0.00	7.67	3.41	2411.79			0.00	4.48	57.12	
		Grass Types 1 - 3			Chaparral Types 4 - 7			Timber Types 8 - 10						
		88.85			228.54			7979.10						
4	Moonridge	108.00	0.00	210.38	30.67	20.40	0.00	5928.09	0.00	0.00	744.32	50.14	125.92	7217.92
	Forest Land	0.00		151.44	30.67	7.24	0.00	3727.34			276.02	0.46	20.75	
	Private Land	108.00	58.94	0.00	13.16	13.16		2200.75			468.29	49.68	105.17	
		Grass Types 1 - 3			Chaparral Types 4 - 7			Timber Types 8 - 10						
		166.94			215.67			5928.09						
5	Big Bear City	78.22	243.96	696.95	0.00	0.00	0.00	1641.94	0.00	0.00	194.88	31.81	100.77	2988.53
	Forest Land	0.00	110.80	643.23	0.00			519.93			0.00	3.31	24.71	
	Private Land	78.22	133.16	53.72				1122.02			194.88	28.50	76.05	
		Grass Types 1- 3			Chaparral Types 4 - 7			Timber Types 8 - 10						
		322.18			0.00			1641.95						
6	Big Bear Lake	42.21	8.89	246.70	46.97	52.44	0.00	2733.06	0.00	0.00	81.61	47.13	39.75	3298.76
	Forest Land	0.96	8.89	246.70	46.97	39.50		1639.63			0.17	0.00	0.00	
	Private Land	41.25	0.00	0.00	0.00	12.94		1093.42			81.44	47.13	39.75	
		Grass Types 1 - 3			Chaparral Types 4 - 7			Timber Types 8 - 10						
		51.10			346.11			2733.05						

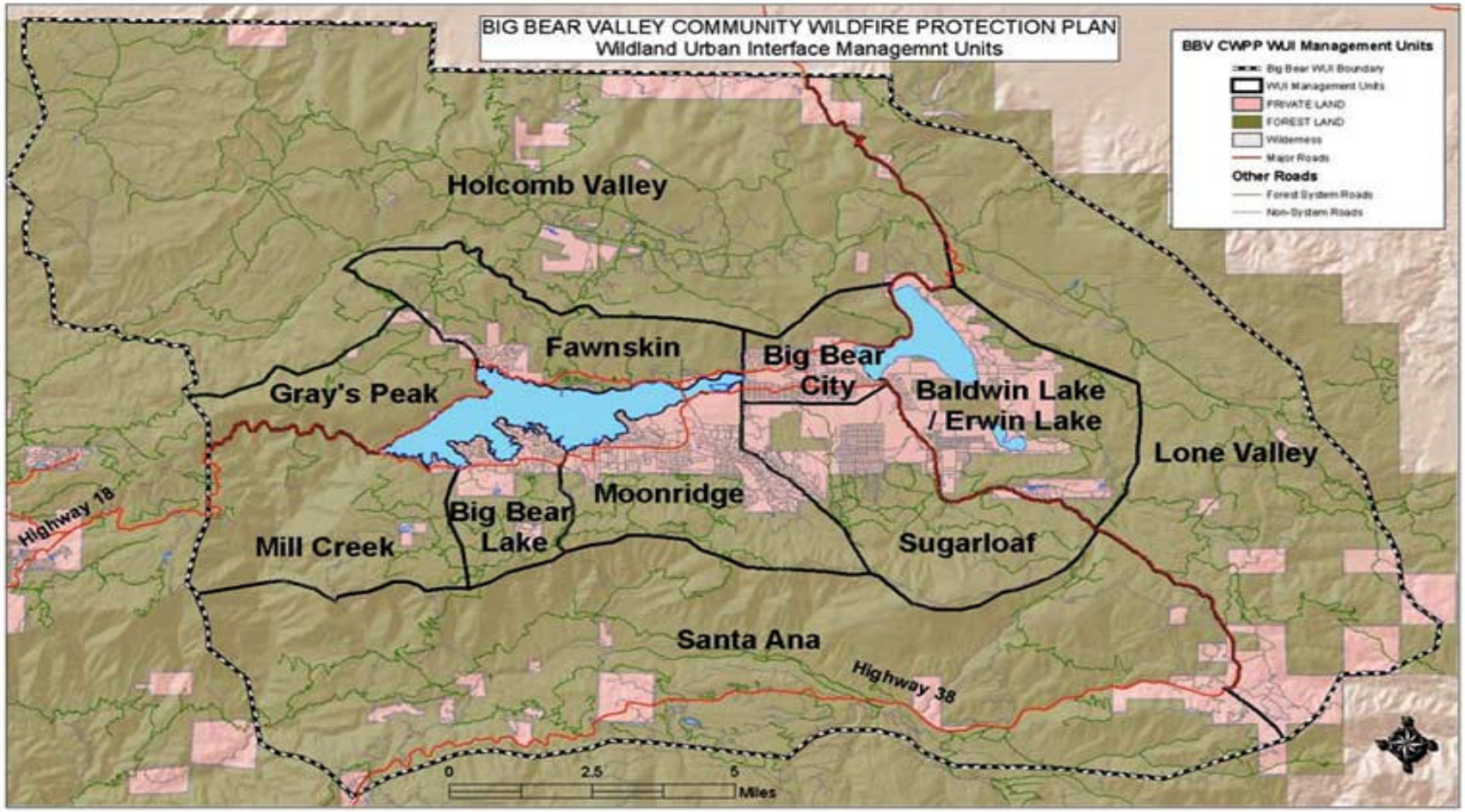
Appendix B
Big Bear Valley Wildland Urban Interface - Fuel Types Acreage by Private and Forest Lands

		Fuel Type 1	Fuel Type 2	Fuel Type 4	Fuel Type 5	Fuel Type 6	Fuel Type 8	Fuel Type 9	Fuel Type 10	Fuel Type 15	Fuel Type 97	Fuel Type 98	Fuel Type 99	
Manage-ment Unit No.	Big Bear Valley Wildland Urban Interface Management Units	Grass Group	Grass Under Story Open Pine	Shrub Group	Medium Brush	Pinion Juniper Sage	Timber Medium Conifer	Long Needle Conifer Hardwood	Timber Heavy Dead Forest Litter	Desert	Agri-culture	Water	Barren	Total Acreage Per Manage-ment Unit
7	Fawnskin	0.00	108.15	388.55	0.00	12.45	44.24	5605.67	0.00	0.00	37.91	6.15	49.81	6252.93
	Forest Land		76.78	388.18		12.45	28.64	4978.55			11.82	3.03	38.11	
	Private Land		31.37	0.37		0.00	15.60	627.11			26.09	3.13	11.70	
		Grass Types 1 - 3			Chaparral Types 4 - 7			Timber Types 8 - 10						
		108.15			401.00			5649.90						
8	Gray's Peak	11.55	12.45	181.97	303.53	432.00	3.06	3620.17	0.00	0.00	23.33	10.61	29.38	4628.05
	Forest Land	2.22	12.45	180.23	303.53	427.48	1.28	3397.56			3.78	8.15	17.42	
	Private Land	9.33	0.00	1.74	0.00	4.52	1.77	222.61			19.55	2.47	11.97	
		Grass Types 1 - 3			Chaparral Types 4 - 7			Timber Types 8 - 10						
		24.00			917.50			3623.22						
9	Millcreek	50.00	26.66	365.14	1865.31	45.10	33.82	5681.04	62.02	0.00	0.00	29.11	174.88	8333.08
	Forest Land	25.32	26.66	365.14	1865.31	45.10	33.82	5537.11	62.02			15.82	161.73	
	Private Land	24.68	0.00	0.00	0.00	0.00	0.00	143.93	0.00			13.29	13.15	
		Grass Types 1 - 3			Chaparral Types 4 - 7			Timber Types 8 - 10						
		76.66			2275.55			5776.88						
10	Holcomb	1357.27	19336.96	5963.05	2146.22	260.48	8.23	17879.15	0.00	4036.37	0.00	20.45	800.01	51808.19
	Forest Land													
	Private Lane													
		Grass Types 1 - 3			Chaparral Types 4 - 7			Timber Types 8 - 10						
11	Santa Ana	236.22	1779.53	10639.78	1926.76	196.56	393.02	24318.49	1197.01	154.56	0.00	39.40	454.56	41335.89
	Forest Land	192.22	1733.07	10374.31	1838.45	175.51	325.10	21908.50	1153.36	148.03	0.00	36.06	429.91	
	Private Land	44.00	46.46	265.48	88.31	21.05	67.91	2409.99	43.66	6.53	0.00	98.34	24.66	
		Grass Types 1 - 3			Chaparral Types 4 - 7			Timber Types 8 - 10						
		2015.75			12763.11			25908.52						
	Total Acres													170447.34

Appendix C
Big Bear Valley Wildland Urban Interface Boundary



Appendix D
Wildland Urban Interface Management Units



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Definitions

A.

accumulation - Any and all limbs, branches, prunings, trimmings, stumps, and parts of domestic, natural or cultivated organic material which has been cut, looped-off, separated or removed or fallen from such trees and have not been destroyed by burning or removal.

adaptive management - A type of natural resource management that implies making decisions as part of an ongoing process. Monitoring the results of actions will provide a flow of information that may indicate the need to change a course of action. Scientific findings and the needs of society may also indicate the need to adapt resource management to new information.

affected environment - The natural environment that exists at the present time in an area being analyzed.

age class - An age grouping of trees according to an interval of years, usually 20 years. A single age class would have trees that are within 20 years of the same age such as 1-20 years or 21-40 years.

aspect - The direction a slope faces. A hillside facing east has an eastern aspect.

aquifer - A body of rock that is saturated with water or transmits water. When people drill wells, they tap water contained within an aquifer.

B.

bark beetle - An insect that bores through the bark of forest trees to eat the inner bark and lay its eggs. Bark beetles are important killers of forest trees.

basal area - The area of the cross section of a tree trunk near its base, usually 4 and 1/2 feet above the ground. Basal area is a way to measure how much a site is occupied by trees. The term basal area is often used to describe the collective basal area of trees per acre.

Best Management Practices (BMP) - Practices designed to prevent or reduce water pollution.

big game - Large mammals such as deer, bear, elk, and antelope that are hunted for sport.

biological control - The use of natural means to control unwanted pests. Examples include introduced or naturally occurring predators such as wasps or hormones that inhibit the reproduction of pests. Biological controls can sometimes be alternatives to mechanical or chemical means.

biological diversity - The number and abundance of species found within a common environment. This includes the variety of genes, species, ecosystems, and the ecological processes that connect everything in a common environment.

biomass - The total weight of all living organisms in a biological community.

board foot - A measurement term for lumber or timber. The amount of wood contained in an unfinished board 1 inch thick, 12 inches long, and 12 inches wide.

broadcast burn - A prescribed fire that burns a designated area. These controlled fires can reduce wildfire hazards, improve forage for wildlife and livestock, or encourage successful regeneration of trees.

browse - Twigs, leaves, and young shoots of trees and shrubs that animals eat. Browse is often used to refer to the shrubs eaten by big game such as elk and deer.

buffer - A land area that is designated to block or absorb unwanted impacts to the area beyond the buffer. Buffer strips along a trail could block views that may be undesirable. Buffers may be set aside next to wildlife habitat to reduce abrupt change to the habitat.

C.

canopy - The part of any stand of trees represented by the tree crowns. It usually refers to the uppermost layer of foliage, but it can be used to describe lower layers in a multi-storied forest.

cavity - A hole in a tree often used by wildlife species, usually birds for nesting, roosting, and reproduction.

chemical control - The use of pesticides and herbicides to control pests and undesirable plant species.

clear cut - A harvest in which all or almost all of the trees are removed in one cutting.

climax - The culminating stage in plant succession for a given site. Climax vegetation is stable, self-maintaining, and self-reproducing.

composition - What an ecosystem is composed of.. Composition could include water, minerals, trees, snags, wildlife, soil, microorganisms, and certain plant species.

condition class – refers to the general deviation of ecosystems from their pre-settlement natural fire regime.

Class 1 – Fire regime within or near historical ranges. Risk of key ecosystem component loss low.

Class 2 – Fire regime moderately altered from historical range. Risk of key ecosystem component loss moderate.
Class 3 – Fire regime significantly altered from historical range. Risk of key ecosystem component loss high.
Class 9 – Fire regime within modified urban forested landscape.

conifer – A tree that produces cones such as a pine, spruce, or fir.

connectivity (of habitats) - The linkage of similar but separated vegetation stands by patches, corridors, or "stepping stones" of like vegetation. This term can also refer to the degree to which similar habitats are linked.

consumptive use - Use of resources that reduces the supply such as logging and mining.

contour - A line drawn on a map connecting points of the same elevation.

cover - Any feature that conceals wildlife or fish. Cover may be dead or live vegetation, boulders, or undercut streambanks. Animals use cover to escape from predators, rest, or feed.

cover type (forest cover type) - Stands of a particular vegetation type that are composed of similar species. The aspen cover type contains plants distinct from the pinion/juniper cover type.

created opening - An opening in the forest cover created by the application of even-aged silvicultural practices.

critical habitat - Areas designated for the survival and recovery of federally listed threatened or endangered species.

crown height - The distance from the ground to the base of the crown of a tree.

cultural resource - The remains of sites, structures, or objects used by people in the past. This can be historical or pre-historic.

cumulative effects - Effects on the environment that result from separate, individual actions that collectively become significant over time.

D.

dbh (diameter at breast height) - The diameter of a tree 4 and 1/2 feet above the ground on the uphill side of the tree.

decision criteria - The rules and standards used to evaluate alternatives to a proposed action on national forest land. Decision criteria are designed to help a decision maker identify a preferred choice from the array of alternatives.

desired future condition - Land or resource conditions that are expected to result if goals and objectives are fully achieved.

developed recreation - Recreation that requires facilities that in turn result in concentrated use of the area. For example, skiing requires ski lifts, parking lots, buildings, and roads. Campgrounds require roads, picnic tables, and toilet facilities.

dispersed recreation - Recreation that does not occur in a developed recreation site such as hunting, backpacking, and scenic driving.

disturbance - Any event, such as forest fire or insect infestations, that alter the structure, composition, or functions of an ecosystem.

Draft Environmental Impact Statement (DEIS) - The draft version of the Environmental Impact Statement that is released to the public and other agencies for review and comment.

E.

early forest succession - The biotic (or life) community that develops immediately following the removal or destruction of vegetation in an area. For instance, grasses may be the first plants to grow in an area that was burned.

ecological approach - An approach to natural resource management that considers the relationships among all organisms including humans and their environment.

ecology - The interrelationships of living things to one another and to their environment or the study of these interrelationships.

ecosystem - An arrangement of living and non-living things and the forces that move among them. Living things include plants and animals. Non-living parts of ecosystems may be rocks and minerals. Weather and wildfire are two of the forces that act within ecosystems.

ecosystem management - An ecological approach to natural resource management to assure productive, healthy ecosystems by blending social, economic, physical, and biological needs and values

ecotype - A population of a species in a given ecosystem that is adapted to a particular set of environmental conditions.

edge - The margin where two or more vegetation patches meet, such as a meadow opening next to a mature forest stand or a ponderosa pine stand next to an aspen stand.

endangered species - A plant or animal that is in danger of extinction throughout all or a significant portion of its range. Endangered species are identified by the Secretary of the Interior in accordance with the Endangered Species Act of 1973.

environmental analysis - An analysis of alternative actions and their predictable long and short-term environmental effects. Environmental analyses include physical, biological, social, and economic factors.

environmental assessment - A brief version of an Environmental Impact Statement (see Environmental Impact Statement).

Environmental Impact Statement (EIS) - A statement of environmental effects of a proposed action and alternatives to it. The EIS is released to other agencies and the public for comment and review.

ephemeral streams - Streams that flow only as the direct result of rainfall or snowmelt. They have no permanent flow.

erosion - The wearing away of the land surface by wind or water.

escape cover - Vegetation of sufficient size and density to hide an animal or an area used by animals to escape from predators.

even aged management - Timber management actions that result in the creation of stands of trees in which the trees are essentially the same age.

F.

fire cycle - The average time between fires in a given area.

fire flow – The amount of water needed in gallons per minute to fight a sustained fire attack in an individual, non-sprinklered building.

fire regime - The characteristics of fire in a given ecosystem such as the frequency, predictability, intensity, and seasonality of fire.

flood plain - A lowland adjoining a watercourse. At a minimum, the area is subject to a 1% or greater chance of flooding in a given year.

forage - All browse and non-woody plants that are eaten by wildlife and livestock.

forest cover type - See cover type.

forest health - A measure of the robustness of forest ecosystems. Aspects of forest health include biological diversity; soil, air, water productivity; natural disturbances, and the capacity of the forest to provide a sustaining flow of goods and services for people.

fuels - Plants and woody vegetation, both living and dead, that are capable of burning.

fuels management - The treatment of fuels that would otherwise interfere with effective fire management or control. For instance, prescribed fire can reduce the amount of fuels that accumulate on the forest floor before the fuels become so heavy that a natural wildfire in the area would be explosive and impossible to control.

function - All the processes within an ecosystem through which the elements interact such as succession, food chain, fire, weather, and the hydrologic cycle.

G.

Geographic Information Systems (GIS) - GIS is both a database designed to handle geographic data as well as a set of computer operations that can be used to analyze the data. In a sense, GIS can be thought of as a higher order map.

ground fire - A fire that burns along the forest floor and does nor affect trees with thick bark or high crowns.

ground water - The supply of fresh water under the earth's surface in an aquifer or in the soil.

group selection - A method of tree harvest in which trees are removed periodically in small groups. This silvicultural treatment results in small openings that form mosaics of age class groups in the forest.

H.

habitat - The area where a plant or animal lives and grows under natural conditions.

habitat diversity - A number of different types of wildlife habitat within a given area.

horizontal diversity - The distribution and abundance of different plant and animal communities or different stages of plant succession across an area of land. The greater the number of communities in a given area, the higher the degree of horizontal diversity.

hydrology - The science dealing with the study of water on the surface of the land, in the soil and underlying rocks, and in the atmosphere.

I.

indicator species - A plant or animal species related to a particular kind of environment. Its presence indicates that specific habitat conditions are also present.

individual tree selection - The removal of individual trees from certain size and age classes over an entire stand area. Regeneration is mainly natural, and an uneven aged stand is maintained.

instream flow - The quantity of water necessary to meet seasonal stream flow requirements to accomplish the purposes of the national forests, including but not limited to, fisheries, visual quality, and recreational opportunities.

integrated pest management (IPM) - IPM evaluates alternatives for managing forest pest populations based on consideration of pest-host relationships.

interdisciplinary team - A team of individuals with skills from different disciplines that focuses on the same task or project.

intermediate cut - The removal of trees from a stand sometime between the beginning or formation of the stand and the regeneration cut. Types of intermediate cuts include thinning, release, and improvement cuttings.

intermittent stream - A stream that flows only at certain times of the year when it receives water from streams or from some surface source such as melting snow.

irreversible - A category of impacts mentioned in statements of environmental impacts that applies to non-renewable resources, such as minerals and archaeological sites. Irreversible effects can also refer to effects of actions that can be renewed only after a very long period of time such as the loss of soil productivity.

L.

ladder fuels - Vegetation located below the crown level of forest trees which can carry fire from the forest floor to tree crowns. Ladder fuels may be low-growing tree branches, shrubs, or smaller trees.

land class - The topographic relief of a unit of land. Land classes are separated by slope; this coincides with the timber inventory process. The three land classes used in the Forest Plan are defined by the following slope ranges: 0 to 35 percent; 36 to 55 percent; and greater than 55 percent.

land use planning - The process of organizing the use of lands and their resources to best meet people's needs over time according to the land's capabilities.

landline - The boundary lines for national forest land.

landscape - A large land area composed of interacting ecosystems that are repeated due to factors such as geology, soils, climate, and human impacts. Landscapes are often used for coarse grain analysis.

late forest succession - The stage of forest succession in which most of the trees are mature or over-mature.

litter (forest litter) - The freshly fallen or only slightly decomposed plant material on the forest floor. This layer includes foliage, bark fragments, twigs, flowers, and fruit.

logging residue (slash) - The residue left on the ground after timber cutting. It includes unutilized logs, uprooted stumps, broken branches, bark, and leaves. Certain amounts of slash provide important ecosystem roles such as soil protection, nutrient cycling, and wildlife habitat.

M.

M - Thousand. Example: Five thousand board feet of timber can be expressed as 5M board feet.

MBF - Thousand board feet (see board feet).

MIS (management indicator species) - A wildlife species whose population will indicate the health of the ecosystem in which it lives, and consequently, the effects of forest management activities to that ecosystem. MIS species are selected by land management agencies. (See "indicator species")

MM – Million.

MMBF - Million board feet. (See board feet)

macro climate - The general large scale climate of a large area as distinguished from the smaller scale micro climates within it.

management action - Any activity undertaken as part of the administration of the national forest.

mass movement/wasting - The down-slope movement of large masses of earth material by the force of gravity. Also called a landslide.

matrix - The least fragmented, most continuous pattern element of a landscape; the vegetation type that is most continuous over a landscape.

mature timber - Trees that have attained full development, especially height and are in full seed production.

micro climate - The climate of a small site. It may differ from the climate at large of the area due to aspect, tree cover (or the absence of tree cover), or exposure to winds.

mineral soil - Soil that consists mainly of inorganic material such as weathered rock rather than organic matter.

mitigation - Actions taken to avoid, minimize, or rectify the impact of a land management practice.

mixed stand - A stand consisting of two or more tree species.

monitoring and evaluation - The periodic evaluation of forest management activities to determine how well objectives were met and how management practices should be adjusted. (See "adaptive management")

mortality - Trees that were merchantable and have died within a specified period of time. The term mortality can also refer to the rate of death of a species in a given population or community.

mosaic - Areas with a variety of plant communities over a landscape such as areas with trees and areas without trees occurring over a landscape.

mountain pine beetle - A tiny black insect, ranging from 1/8 to 3/4 inch in size, that bores through a pine tree's bark. It stops the tree's intake and transport of the food and nutrients it must have to stay alive, thus killing the tree.

multiple use management - The management of all the various renewable surface resources of national forest lands for a variety of purposes such as recreation, range, timber, wildlife and fish habitat, and watershed.

N.

National Environmental Policy Act (NEPA) - Congress passed the NEPA in 1969 to encourage productive and enjoyable harmony between people and their environment. One of the major tenets of the NEPA is its emphasis on public disclosure of possible environmental effects of any major action on public lands. Section 102 of the NEPA requires a statement of possible environmental effects to be released to the public and other agencies for review and comment.

National Forest Land and Resource Management Plan (NFLRMP) - Also called the Forest Plan or the Plan. This document guides the management of a particular national forest and establishes management standards and guidelines for all lands of that national forest.

National Forest Management Act (NFMA) - This law was passed in 1976 and requires the preparation of regional guides and forest plans.

National Forest Recreation Sites (NFRS) - National forest recreation sites that have been inventoried.

natural barrier - A natural feature, such as a dense stand of trees or downfall, that will restrict animal travel.

natural resource - A feature of the natural environment that is of value in serving human needs.

no action alternative - The most likely condition expected to exist in the future if management practices continue unchanged.

non-commercial vegetative treatment - The removal of trees for reasons other than timber production.

non-consumptive use - The use of a resource that does not reduce the supply. For instance, bird watching is a non-consumptive use of wildlife. Boating and fishing are non-consumptive uses of water.

non-renewable resource - A resource whose total quantity does not increase measurably over time so that each use of the resource diminishes the supply.

nutrient cycle - The circulation of chemical elements and compounds, such as carbon and nitrogen, in specific pathways from the non-living parts of ecosystems into the organic substances of the living parts of ecosystems and then back again to the non-living parts of the ecosystem. For instance, nitrogen in wood is returned to the soil as the dead tree decays; the nitrogen again becomes available to living organisms in the soil, and upon their death, the nitrogen is available to plants growing in that soil.

O.

old growth - Old forests often containing several canopy layers, variety in tree sizes and species, decadent old trees, and standing and dead woody material.

organic soil - Soil at least partly derived from living matter such as decayed plant material.

over-mature timber - Trees that have attained full development, particularly in height, and are declining in vigor, health, and soundness.

overstory - The upper canopy layer; the plants below comprise the understory.

P.

park-like structure - Stands with large scattered trees and open growing conditions, usually maintained by ground fires.

partial retention - A visual quality objective that generally means man's activities may be evident but must remain subordinate to the characteristic landscape.

patch - An area of homogeneous vegetation in structure and composition.

percolation - Downward flow or infiltration of water through the pores or spaces of rock or soil.

perennial stream - A stream that flows throughout the year and from source to mouth.

permitted grazing - Grazing on a national forest range allotment under the terms of a grazing permit.

personal use - The use of a forest product, such as firewood, for home use and not for commercial use.

pole/sapling - The stage of forest succession in which trees are between 3 and 7 inches in diameter and are the dominant vegetation.

pole timber - Trees at least 5 inches in diameter but smaller than the minimum size for saw timber.

pre-existing use - Land use that may not conform to a zoning ordinance but existed prior to the enactment of the ordinance.

prescribed fire - Fire set intentionally in wildland fuels under prescribed conditions and circumstances. Prescribed fire can rejuvenate forage for livestock and wildlife or prepare sites for natural regeneration of trees.

prescription - Management practices selected to accomplish specific land and resource management objectives.

pre-suppression - Activities carried out in advance of fire occurrence to ensure effective suppression when the need arises.

productive - The ability of an area to provide goods and services and to sustain ecological values.

prognosis - A computer model for timber growth and yield. It projects per-acre growth and volume yield for commercial timber stands.

public land - Land for which title and control rests with a government---Federal, state, regional, county, or municipal.

R.

range - Land on which the principle natural plant cover is composed of native grasses, forbs, and shrubs that are valuable as forage for livestock and big game.

range of variability (also called the historic range of variability or natural range of variation) - The components of healthy ecosystems fluctuate over time. The range of sustainable conditions in an ecosystem is determined by time, processes (such as fire), native species, and the land itself. For instance, ecosystems that have a 10 year fire cycle have a narrower range of variation than ecosystems with 200-300 year fire cycle. Past management has placed some ecosystems outside their range of variability. Future management should move such ecosystems back toward their natural, sustainable range of variation.

recharge - The addition of water to ground water by natural or artificial processes.

reforestation - The restocking of an area with forest trees by either natural or artificial means such as planting.

regeneration - The renewal of a tree crop by either natural or artificial means. The term is also used to refer to the young crop itself.

release cutting - Removal of competing vegetation to allow desired tree species to grow.

removal cut - The removal of the last seed bearers or shelter trees after regeneration is established.

resilience - The ability of an ecosystem to maintain diversity, integrity, and ecological processes following a disturbance.

restoration (of ecosystems) - Actions taken to modify an ecosystem to achieve a desired, healthy, and functioning condition.

revegetation - The re-establishment and development of a plant cover by either natural or artificial means such as re-seeding.

riparian area - The area along a watercourse or around a lake or pond.

riparian ecosystem - The ecosystems around or next to water areas that support unique vegetation and animal communities as a result of the influence of water.

roundwood - Timber and fuel wood prepared in the round state such as house logs and telephone poles.

run-off - The portion of precipitation that flows over the land surface or in open channels.

S.

sanitation salvage - The removal of dead, damaged or susceptible trees primarily to prevent the spread of pests or disease and promote forest health.

Sapling - A loose term for a young tree more than a few feet tall and an inch or so in diameter that is typically growing vigorously.

sawtimber - Trees that are 9 inches in diameter at breast height or larger that can be made into lumber.

second growth - Forest growth that was established after some kind of interference with the previous forest crop such as cutting, fire, or insect attack.

sensitive species - Plant or animal species which are susceptible to habitat changes or impacts from activities. The official designation is made by the USDA Forest Service at the regional level and is not part of the designation of Threatened or Endangered Species made by the U.S. Fish and Wildlife Service.

single tree selection - See individual tree selection.

size class - One of the three intervals of tree stem diameters used to classify timber in the Forest Plan data base. The size classes are: Seedling/Sapling (less than 5 inches in diameter); Pole Timber (5 to 7 inches in diameter); Sawtimber (greater than 7 inches in diameter)

slash - The residue left on the ground after timber cutting or left after a storm, fire, or other event. Slash includes unused logs, uprooted stumps, broken or uprooted stems, branches, bark, etc.

snag - A standing dead tree. Snags are important as habitat for a variety of wildlife species and their prey.

stand - A group of trees that occupies a specific area and is similar in species, age, and condition.

standards and guidelines - Requirements found in a Forest Plan which impose limits on natural resource management activities, generally for environmental protection.

stewardship - Caring for the land and its resources to pass healthy ecosystems to future generations.

structure - How the parts of ecosystems are arranged, both horizontally and vertically. Structure might reveal a pattern, mosaic, or total randomness of vegetation.

succession - The natural replacement in time of one plant community with another. Conditions of the prior plant community (or successional stage) create conditions that are favorable for the establishment of the next stage.

successional stage - A stage of development of a plant community as it moves from bare ground to climax. The grass-forb stage of succession precedes the woody shrub stage.

suitability - The appropriateness of certain resource management to an area of land. Suitability can be determined by environmental and economic analysis of management practices.

sustainability - The ability of an ecosystem to maintain ecological processes and functions, biological diversity, and productivity over time.

sustainable - The yield of a natural resource that can be produced continually at a given intensity of management is said to be sustainable.

sustained yield - The yield that a renewable resource can produce continuously at a given intensity of management.

T.

thinning - A cutting made in an immature stand of trees to accelerate growth of the remaining trees or to improve the form of the remaining trees.

threatened species - Those plant or animal species likely to become endangered throughout all or a specific portion of their range within the foreseeable future as designated by the U.S. Fish and Wildlife Service under the Endangered Species Act of 1973.

Timber Stand Improvement (TSI) - Actions to improve growing conditions for trees in a stand, such as thinning, pruning, prescribed fire, or release cutting.

type conversion - The conversion of the dominant vegetation in an area from forested to non-forested or from one species to another.

U.

underburn - A burn by a surface fire that can consume ground vegetation and "ladder" fuels.

understory - The trees and woody shrubs growing beneath the overstory in a stand of trees.

uneven-aged management - Actions that maintain a forest or stand of trees composed of intermingling trees that differ markedly in age. Cutting methods that develop and maintain uneven-aged stands are single-tree selection and group selection.

unsuitable lands - Forest land that is not managed for timber production. Reasons may be matters of policy, ecology, technology, silviculture, or economics

V.

variety class - A way to classify landscapes according to their visual features. This system is based on the premise that landscapes with the greatest variety or diversity has the greatest potential for scenic value.

vegetation management - Activities designed primarily to promote the health of forest vegetation for multiple-use purposes.

vegetation type - A plant community with distinguishable characteristics.

vertical diversity - The diversity in a stand that results from the different layers or tiers of vegetation.

viable population - The number of individuals of a species sufficient to ensure the long-term existence of the species in natural, self-sustaining populations that are adequately distributed throughout their range.

visual resource - A part of the landscape important for its scenic quality. It may include a composite of terrain, geologic features, or vegetation

W.

water table - The upper surface of groundwater. Below it, the soil is saturated with water.

water yield - The runoff from a watershed, including groundwater outflow.

watershed - The entire region drained by a waterway (or into a lake or reservoir). More specifically, a watershed is an area of land above a given point on a stream that contributes water to the stream flow at that point.

wildfire - Any wildland fire that is not a prescribed fire.

wildlife habitat diversity - The distribution and abundance of different plant and animal communities and species within a specific area.

woodland products - Harvestable items from pinion-juniper woodlands. These include fuel wood, posts, pine nuts, and Christmas trees.

Z.

Zone of Influence (ZOI) - The area influenced by Forest Service management activities.