Black Forest Community Wildfire Protection Plan (BFCWPP)

11 October 2007

EXECUTIVE SUMMARY

A Community Wildfire Protection Plan (CWPP) is intended to assist residents in an area (the community) to reduce the risk of fire in the wildland/urban (WUI) interface. The WUI is where forest meets urban development – generally where residences are located within treed areas such as the Black Forest (BF). The "community" selected for this analysis is that served by Black Forest Fire/Rescue Protection District.

How does a CWPP help in this process? It describes and plans the actions that individuals and groups of individuals should take to limit the spread of fire and to otherwise reduce threats to life and property.

Reducing wildfire risk requires first identifying the community's fire-related physical characteristics and classifying the types and severities of risks in the area. This involves understanding the factors that lead to fire ignition and spread, as well as the actions that can be taken to reduce those risks.

Our overall strategy for the BF CWPP is that it will evolve through time, become increasingly detailed, and describe accomplishments to date as well as proposed future actions. This current CWPP version describes our assessment process, some initial conclusions, current accomplishments, and the proposed content of the next version. It represents a beginning, not an end.

The next CWPP will identify and prioritize the risk associated with each Black Forest section (surveyed square mile). It will then recommend plans for moderating risks, both for the Black Forest as a whole and for the most highly threatened areas. These recommendations will include:

- Establishing reduced fuel loads along major roads
- Establishing reduced fuel loads in specific areas
- Reducing the fuel load in the Forest in general
- Thinning trees and promoting forest health
- Establishing defensible spaces around buildings
- Identifying, signing, and prioritizing escape routes
- Ensuring public emergency notification mechanisms are in place and known to the public
- Establishing programs for public education and involvement
- Planning programs to implement and monitor progress.

PREFACE

The factors that create wildfire risk in the wildland/urban interface, wildfire mechanisms, and the list of possible mitigation approaches are virtually identical across communities. What varies are the particular mixes in different areas.

Among the assessment strategies identified in Section 3.1 of this document is "Don't reinvent." The authors of this document have taken this strategy to heart. The form and content of this section, as well as much of this document, is based upon the Teller County Community Wildfire Protection Plan. The assessments and conclusions, while perhaps similar in form and level of detail, are completely independent.

The authors of this CWPP wish to acknowledge the debt that they owe to the Teller County authors.

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1.0 Introduction

The Black Forest as it exists today is the result of many influences, but the principle one is human activity during the past 150 years. The historic development of Black Forest is quite similar to most of the ponderosa pine forests in Colorado's lower montane life zone. Before settlement, it burned every five to thirty years—what foresters call a frequent, low intensity fire regime. Such fires burned primarily on the ground and thinned the trees. The forest structure was quite different from the present. The forest was open with 30 to 50 large, mature trees per acre, and widely spaced younger trees grew in the openings.

With settlement, the primeval forest was extensively logged, and the present forest grew back after the era of logging. Fires were suppressed, and it grew to maturity without thinning by man or fire. Consequently, the present forest is unnaturally dense. Its canopy is closed and trees are stressed for light, water, and nutrients. The forest is now susceptible to disease, insects, and intense fire. These intense fires - called crown fires - are the most fearsome of all wildland fires. As fire reaches the tops of the trees, it moves through the closed forest canopy producing extreme heat and defying control efforts. Crown fires pose extreme dangers to firefighters, threaten lives and property, and cause severe environmental damage.

1Figure 1: A Crown (Pine Glen) Fire
(Source: BFFRPD)

This danger has been recognized by foresters for a long time. The devastating fire season of 2002 forced many Black Forest residents to acknowledge the potential severity of the problem facing them. Like many of the counties that suffered during that time, the Black Forest community had not had a wildfire to remove the ever-increasing fuel load. And like them, we also had a worrisome wildfire. We were fortunate that the ignition location and wind direction combined to allow the Pine Glen fire to be fought successfully over a period of several days with no loss of life or structures. Without a planned and vigorous effort to reduce the risk and contain the spread of wildfires, Black Forest will become more susceptible to this threat in the future.

The Black Forest community is primarily a patchwork of five-acre residential lots. Some considerably larger landholdings exist as well as some smaller residential lots that preceded zoning, are within a water district, or are clustered within an overall subdivision that approximates five-acre zoning. Many areas are heavily forested while others are essentially open prairie, with perhaps a few isolated trees. The entire area is considered to be a wildland/urban interface (WUI). Black Forest trees are primarily ponderosa pine, with a few Douglas fir, aspen, cottonwoods, and Gambel oak. Our climate is naturally semi-arid and the drought conditions of recent years have made the overgrown forest even more vulnerable to crown fire. The area continues to grow with much of the housing growth within the forested area.

The area receives fire suppression from the Black Forest Fire/Rescue Protection District (BFFRPD), which has mutual aid agreements with all surrounding fire agencies, including the City of Colorado Springs. Water is supplied via hydrants in the Park Forest Water District on the southeastern side of the area, and via tanker shuttle elsewhere, although most recent subdivisions have installed 10 thousand to 30 thousand gallon underground tanks from which water may be drafted.

The Black Forest community has also benefited greatly from the 14 years of the slash/mulch operation that has substantially reduced our fuel load. Run by the Slash and Mulch Committee (SAMCOM), manned by numerous volunteers, and under major sponsorship of El Paso County Solid Waste Management, this program has been exceptionally successful. Located southeast of the intersection of Shoup and Herring Roads, the site accepts trees up to eight inches in diameter, as well as pine needles, and hires a commercial tub grinder to produce mulch, which is then provided to all who want it. The entire operation is free, although donations to Care and Share are gratefully accepted, and there is a charge for a loader if one chooses not to load mulch.

Figure 2: Slash/Mulch Operation (source: SAMCOM)

In late 2003, the incentive for communities to engage in comprehensive forest planning was given new and unprecedented impetus with the enactment of the federal Healthy Forests Restoration Act (HFRA). In order for a community to take full advantage of this new opportunity, it must first prepare a Community Wildfire Protection Plan (CWPP).

In early 2006, increasing concern amongst citizens, BFFRPD officials, forest management agencies, and El Paso County officials led to a growing consensus that a CWPP would be beneficial. The Black Forest Community Club (BFCC) decided to sponsor such an activity and created a standing Committee to undertake the effort.

1.1 The CWPP Development Process

The BFCC CWPP development committee consists of the following volunteers:

Chairman: Dan Gorton, System Manager, Pikes Peak Regional Communications Network
Ron Brown, Board Member, BFCC
Peter Burleson, Chair, Board of Directors, BFFRPD
Mary Hammel, BFCC
Chuck Lidderdale, Vice President and Webmaster, BFCC
Walt Seelye, firefighter and Firewise Assessment Coordinator, BFFRPD
Ruth Ann Steele, Manager, Black Forest Slash/Mulch Program

Dave Ury, Fire Chief, BFFRPD

The expertise and contributions of the following advisors proved invaluable:

Mark Johnston, Deputy Director, El Paso County Forestry and Noxious Weed Division
Dave Root, Assistant District Forester, Colorado State Forest Service (CSFS)

At the preliminary meeting of the development committee, it was recognized that the full level of detail desired for the plan would take considerable effort over a sustained time period. The Committee therefore resolved to produce the plan in multiple phases – an initial plan that would meet all requirements of the HFRA, and subsequent versions that would provide finer-grained descriptions of the topography, conditions, ownership, risks, and mitigation recommendations for smaller areas within the BFFRPD. A major objective of this first phase was therefore to establish a process and structure that would support this evolution over time. We intend that the CWPP become a component of an overall Community Emergency Preparedness Plan that addresses all emergency risks. This document represents the first step in the CWPP process.

1.2 Objectives of the CWPP

The overall objective of the CWPP is to provide guidance to community agencies and individuals that will reduce the risk to life and property due to wildfire. Individuals, agencies, and organizations can accomplish this objective together through the effective education, cooperation and coordination of available resources. There are many sub-objectives, including:

Promote thinning
Promote cleanup of slash and other combustibles
Establish/enhance fuel break buffer zones
Improve defensible space
Identify high-risk areas and recommend mitigation alternatives
Design and establish programs to:
- Increase public awareness of fire-related risks, remedies, and advantages
- Train homeowners about fire defensive methods
- Inform residents about evacuation communications and routes
- Provide incentives for fuels reduction
- Assist firefighters in real-time priority assessment through prior property assessments

Create a basis for grant funding concerning:
- Slash/mulch operation expansion
- Establishment of evacuation routes with reduced fire risk
- Proactive community fire/safety programs
- Forest health improvement
- Homeowner assistance with mitigation expenses

2.0 Community Identification and Description

2.1 Black Forest Physiographic Description

Located north and somewhat east of the City of Colorado Springs, yet south of El Paso County's northern border, the Black Forest community has primarily become a bedroom community of the City. For purposes of this plan, the Committee has determined to use the borders of the BFFRPD to identify the community. Approximately 46 square miles in size, the Black Forest ranges in elevation from 6500 ft at its southern end to 8000 ft along portions of the Palmer Divide. The vegetation is primarily ponderosa pine and grasslands.

Ponderosa pine ecosystems such as Black Forest are naturally subject to frequent, low intensity fires. The result of such fires is to maintain the forest in an open, park-like condition. Trees would be large and widely spaced with a grassy understory. After a century of fire suppression, Black Forest has assumed an unnatural condition in which the trees are extremely dense and severely stressed from competition for light, nutrients and water. The stressed trees are susceptible to attack by bark beetles—particularly mountain pine beetles and ips beetles.

Furthermore, large pockets of trees are infected with dwarf mistletoe. Over a period of years, this parasitic plant slowly kills trees by robbing the host tree of food and water. As the vigor of infected trees declines, the host becomes susceptible to attack by bark beetles. Currently there are many more trees infected with mistletoe than are killed by bark beetles. The large number of infected trees in Black Forest indicates that the potential for a devastating beetle epidemic, such as the one in Grand, Summit and Routt Counties is real. The recent drought has exacerbated this threat.

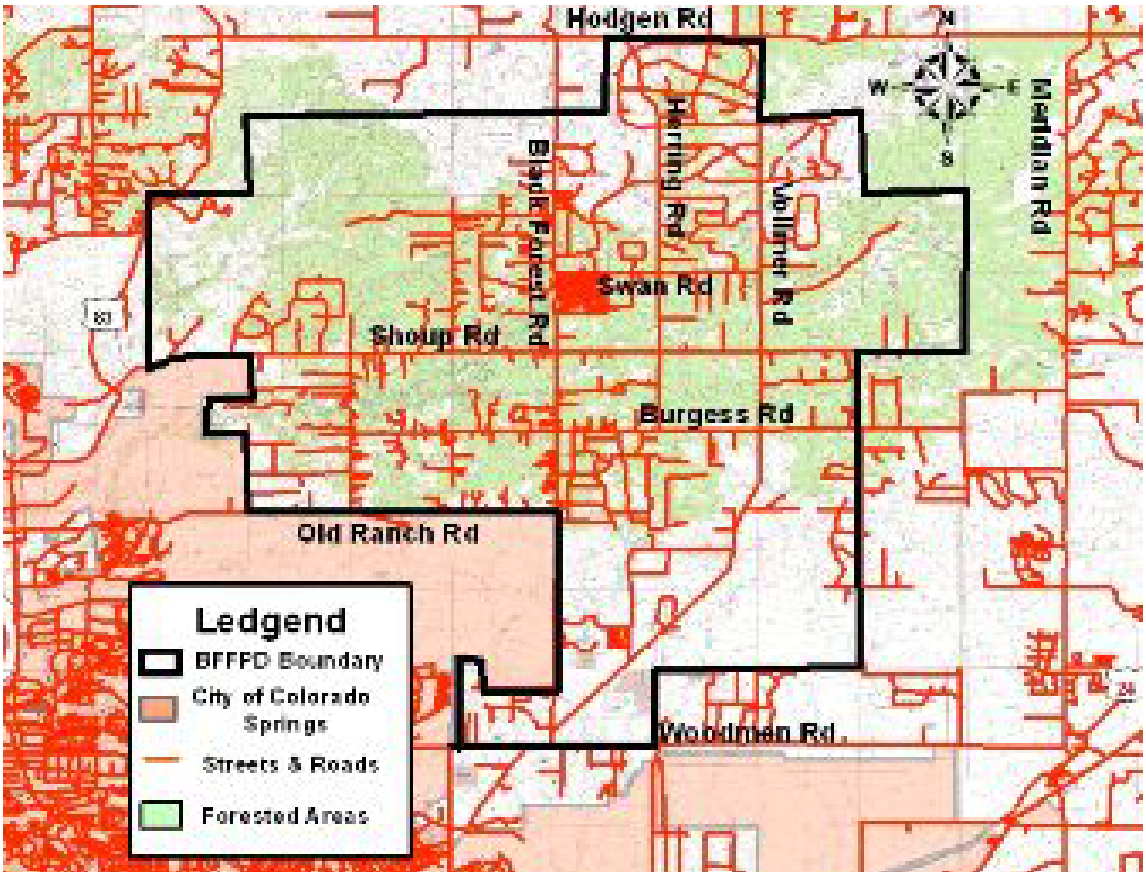

Figure 3: Black Forest CWPP Boundary Map.

2.2 Land Distribution

Land distribution in the Black Forest is primarily private residential lots. These lot sizes vary from five to less than one acre. There are no parcels of federal land within the District. Some larger private parcels that were once ranches remain, but the trend over the last decade is that most of these have been sold for development. There are two parcels of public land, the Black Forest Regional Park owned by El Paso County and The Black Forest School Section owned by the public under trusteeship by The State Board of Land Commissioners.

3.0 Community Assessment

3.1 Assessment Strategy Before getting into the details of hazard identification, the Committee defined a strategy to guide how the entire project would be pursued. The following are the key strategies that guided the work.

Empirical: One key element of the project strategy was a commitment to be empirical. In other words, the Committee felt it essential to base its analysis and conclusions on observable, measurable, objective information.

Map oriented: Given the large scale of this project and the huge volumes of data involved, the Committee quickly decided to use digital maps as the basis for organizing hazard data. The El Paso County Information Services Department has excellent computer-based mapping capabilities. Tools made available to the group by the County IS department included mapping tools that can include many "layers" of data including topography, roads, infrastructure, fuels profiles, and population densities.

Highest Priorities First: It was clear to Committee members from the beginning that it would be easy to get consumed with details, threatening the completion of the plan. Accordingly, it was agreed at the beginning that study efforts would be comprehensive (in other words cover the entire area and all of the key factors) and identify the overall highest priority issues. But, the strategy was also selective – only certain selected priority issues were scrutinized to the level of detail needed as a foundation for recommendations. This meant for example, that detailed mitigation plans, cost analyses, and so on would be addressed in future versions of the CWPP. We have concentrated on issues that need to be addressed immediately, and though long-term goals are identified, they are not addressed in detail. The Committee expects future versions of this living document to provide increasing levels of detail as necessary.

We did not attempt to make specific, detailed mitigation recommendations for each of the many subdivisions in the Fire Protection District. Teller County has developed an abbreviated version of their CWPP for use in discrete subdivisions. These neighborhood CWPPs make use of the information developed for the general Teller County CWPP, but make detailed mitigation recommendations specific to a particular neighborhood. Neighborhood CWPPs have been written for communities as large as several hundred houses and as small as five houses. We believe this approach is adaptable to Black Forest and will be pursued in the future.

Don't reinvent: An important aspect of the CWPP is to provide property owners with information on what they can do to increase safety. Property owner projects involving "defensible space," structure ignitability factors, thinning specifications, and neighborhood fire protection require access to how-to information as well as information on sources of help such as fire mitigation grants.

A wealth of high quality information on all these topics is readily available. Accordingly the CWPP does not attempt to restate or reinvent this kind of information – rather the CWPP refers to major sources where citizens and organizations can find help.

Multiple-level Assessment: A primary purpose of the CWPP is to be a method of communicating to both public entities and residents, exactly what the community's priorities are to reduce the threat that immersion of structures within a forest poses to community life and property.

A second purpose of the CWPP, however, is to identify hazard issues on specific private and public lands and point to ways to reduce vulnerability to wildfire hazard.

These two objectives are quite different. They require different tools, different criteria for ratings, and have different kinds of recommendations. Accordingly, the CWPP analysis and recommendations will be performed in multiple phases.

Section Assessments: On behalf of the Committee, a number of community volunteers will perform on-site assessments of 14 different factors (see Table I) in each of 46 sections across the area. Many volunteers have already been identified from the BFFRPD, the SAMCOM, the Community Club, and the community at large. Volunteers will be trained by professional staff from the Fire District. The data collected will be summarized into six major factors as shown in Appendix III. These six factors contribute to the overall hazard rating for both risk of crown fire and section preparedness for wildfire. It is important to understand that these ratings will be for each section as a whole – not for individual properties within a section. They will represent an averaging or overview across the entire section. Accordingly, certain specific areas within each section will undoubtedly differ from the overall section rating.

Integrate with the Federal Emergency Management Agency (FEMA) All-Hazard Plan: It was noted that much of the work being undertaken would have direct application to FEMA's required Pre-Disaster Hazard Mitigation Plan. It is intended that this CWPP become the Wildfire Hazards section of an all-hazard plan for the Black Forest area.

3.2 Mitigation Principles

The Committee will base its data collection, data analysis, and final recommendations on several well-established principles of wildfire risk mitigation. A few of the key principles underlying the overall project are highlighted here.

3.2.1 Crown Fire vs. Ground Fire and their Effects

Although there are an infinite variety of wildfire behaviors, it is useful in the ponderosa forests that dominate the Black Forest to distinguish crown fires from ground fires. Crown fires are wildfires that move in dense forest and burn from the ground all the way through the tree crowns (see e.g. Fig. 1). They jump downwind by spotting and torching. They destroy forests, killing all or most trees, sterilizing soils, and accelerating erosion. In contrast, ground fires burn through a forest with flames staying nearer the ground and generally not reaching up into the canopy. The effects of ground fires (Fig. 4) are often beneficial to the health and safety of the forest and long-term damage to the forest and watersheds is minimal. The problem is ensuring that they are contained effectively.

Figure 4: Ground fire near Grant Village, Yellowstone National Park
Jim Peaco, public domain

The mitigation strategies followed by the committee were based on the notion that ground fires will occur, and there is minimal (but some) opportunity to reduce the incidence of wild fire ignitions. The goal is to reduce the likelihood of crown fire in any area. Any such fire within the area threatens values such as lives, structures, and infrastructure. Further, the goal is to provide areas or "zones" in the forest where any crown fire can be rapidly contained and forced to "lay down" into a more benign ground fire.

3.2.2 Wildfire Behavior and Fire Suppression

Any crown fire in this area would be immediately confronted by the combined resources of all nearby fire departments, and would undoubtedly be supported by state and perhaps federal entities as well. If a fire threatens to exceed the suppression capabilities of the BFFRPD, mutual aid will be sought from neighboring fire districts. If a fire should exceed these resources, additional aid will be sought on a State or National level. As more aid is needed it follows that it will take longer to arrive. Because crown fires are difficult to suppress, it is important to establish in advance defensive barriers (akin to fuel breaks) that will help slow the advance of a fire, and give available resources a chance to contain it.

3.2.3 Causative factors

Crown fires will usually occur in areas of increased forest density, steep terrains, plentiful "ladder fuels", and lower tree moisture levels. Ground fires will usually be confined to

areas where trees are thinned with substantial gaps in the canopy, trees are trimmed of low branches, ladder fuels are removed, moisture levels are higher, and where concentrations of downed woody fuels have been removed.

3.2.4 Thinning

A compelling body of evidence demonstrates that by performing thinning in an otherwise crown fire-prone forest, its safety can be dramatically enhanced. Thinning means simply eliminating a sufficient number of trees to provide a recommended spacing between them. Experience demonstrates that even a dangerous crowning and torching fire that advances into a forest area that has been properly treated with thinning procedures, may "lie down" to become a manageable ground fire. Thinning also promotes forest health.

3.2.5 Fuel Breaks

A fuel break, (also called a shaded fuel break) is an area where trees have been thinned to create an open forest canopy, ladder fuels have been eliminated, and ground fuels substantially reduced. Much of the mitigation strategy recommended by the Committee is based on creating fuel breaks throughout the forest. Areas in which the fuel load has been greatly reduced should be designed to allow any advancing crown fire to transition to a ground fire and hence give a possible opportunity to suppress the wildfire before it spreads. Although Black Forest residents have chosen to live here because of the forest, the risk of significant wildfire is such that we may have to sacrifice a few trees now to potentially save many in the future. Residents should be aware that establishment of strategic fuel breaks are not a substitute for restoration of the forest to healthy conditions. Fuel breaks are effective ways to slow the spread of a fire, but they will not prevent loss of property or damage from a fire burning between fuel breaks. By any measure, the best method of fire mitigation is restoration of the forest to pre-settlement conditions on a forest-wide level.

3.2.6 Defensible Space

If sufficient defensible space is provided surrounding structures, a wildfire could advance through and around structures and other values without causing serious damage. Clearly, defensible space for a ground fire is more feasible than defending against an advancing crown fire.

As previously noted, wildfires often exceed the ability of available fire fighting resources, and it is impossible to defend every structure. Homes with defensible space have been shown to have a significantly greater chance of surviving a wildfire without the assistance of firefighters.

3.2.7 Mitigation Responsibilities

The Black Forest area includes no federal property, and the amount of County, State, and other public property is quite limited. The Fire Department does not have mandated

responsibility for preparing private property for fire safety. Therefore, the primary opportunity to decrease risk from wildfire lies in the hands of private property owners acting individually or as a community.

3.3 Public Lands Assessment

Aside from fairly small properties associated with Edith Wolford Elementary School, and the BFFRPD, etc. there are only two sizable parcels of public lands: the School Section, and the Black Forest Regional Park and collocated El Paso County Department of Transportation Road Maintenance facility, which belong to the County. A "section" is a square mile of land predefined by official survey and identified by "Range," "Township," and "Section" numbers. Appendix 1 identifies all sections in our study area in three ways: 1) by R, T, and S; 2) by the associated county five-digit reference number; and 3) by a short description based on a road intersection or geographical feature.

The School Section (16) is one of many sections of School Trust Land in Colorado. It includes the ten acres on which the School in the Woods is located, owned by Academy School District 20. The remaining acres of the parcel are administered by the Board of Land Commissioners. There are currently three lessees: School District 20 holds the surface lease, El Paso County holds a lease around the perimeter for the trail maintained by the County Trails Association as well as for the property used by SAMCOM for the slash/mulch site, and the Colorado State Forest Service (CSFS) holds a silvicultural lease. All forest management is done by the CSFS as agent for the Land Board.

The entire section was thinned around 1980 to restore the forest to pre-settlement conditions. Since the initial thinning, dense regeneration has grown under the open forest canopy. Most of the forest management activity during the last decade has centered on thinning of the regeneration. Combinations of commercial forest product sales, prescribed burning and noncommercial thinning have been used to thin the young trees. About one third of the regeneration has been thinned. A shaded fuel break is completed along the northern portion of the section from the Slash/Mulch site to the meadow at the corner of Shoup and Vollmer Roads. Another fuel break has been established along the west side of the School in the Woods boundary, and District 20 has put considerable effort into thinning their ten acres. Currently a new forest inventory is being completed on the section, and a revised management plan will be completed within a year.

All public property could benefit from continued selective thinning and ground fuels removal.

3.4 Private Lands Assessment

Other than the overall assessment (see Section 3.4.2.1), the committee's consideration of private lands has currently been limited to planning two overall measures at the Section level (the first is complete based on recent information and included): Section Value, and Section Wildfire Risk. The former attempts to measure the relative loss if an entire Section were to burn; the latter the relative likelihood of such an event happening. We recognize that such an event is highly unlikely; nonetheless these measures are needed to help identify the most severe risks and thereby direct resources toward their mitigation. Also, identifying hazards at the section level will help to increase citizen and organization awareness and encourage projects to increase safety.

3.4.1 Section Value Assessment

In order to help properly establish priorities for risk remediation, some concept of section value is needed. One must realize at the outset that this is an attempt to think the unthinkable, and to value the invaluable – namely to say that if a wildfire were to destroy all the property within a section, how would one prioritize the loss of that against some other section. To its owner, the loss of one individual parcel can range from minor to catastrophic, depending upon factors such as insurance, whether or not there is a dwelling on the parcel, one's individual finances, etc. One also must work with some version of "official" as opposed to subjective data.

We have collected data from the El Paso County Assessor's Office that identifies the number of parcels in each section (assumed for our purposes to represent the number of dwellings), total market value of each section as reported by the Assessor's office, and total assessed section value. We immediately realized that simply using total value as a single measure would be an inappropriate measure of Section Value, since the loss of one $900,000 "mansion" should not count as equal to the loss of three $300,000 dwellings.

We therefore created indices identifying both the relative number of parcels and relative values for each section. To do this, we added up the total number of parcels and divided by the number of sections to calculate the average number of parcels per section within the BFFRPD area. Then we divided the number of parcels in each section by this average to obtain a "Parcel Factor" (PF) – a number indicating the density of parcels relative to the average. We also calculated a "Value Factor" (VF) in a corresponding manner. Note that if all sections were completely homogeneous – i. e. if every section had the same number of parcels with the same aggregate market value, then all these factors would be exactly one. By multiplying these two indices we calculated our (admittedly somewhat subjective) single value combining the number of parcels with total market value. We then divided the 46 sections into three roughly equally sized categories: 1, 2, or 3, with 1 being the highest priority. These results are presented in Appendix II. The group of sections with the highest value all has PF x VF values above 1.6. This information will be updated (new Assessor's data will be used) in each version of the CWPP.

3.4.2 Section Risk Assessment

3.4.2.1 Initial Risk Assessment

The initial community assessment was accomplished using maps and the intimate knowledge of the Community by BFFRPD, CSFS and CWPP Committee personnel. Fire behavior is determined by three factors: weather, topography and fuels. In the Black Forest fuels are the primary consideration for determining risk. Weather is variable, and cannot be determined in advance of a wildfire. The topography in Black Forest consists of rolling terrain that is generally consistent over the entire district. Exceptions are a few hilly areas and river valleys. Therefore, terrain becomes a consideration only on a small scale. Vegetation varies from open grassland, to small areas of Gambel oak, to dense forest. It is this vegetation that will primarily determine the hazard.

Using aerial photographs it was possible to determine which portions of the District could be labeled low, moderate, or high for fire risk.

The general criteria for each rating were determined as follows:

> Low: Areas of open grassland or grassland with scattered trees. Any trees are widely spaced with canopy separation greater than 20 feet and few ladder fuels. Riparian areas with primarily deciduous trees are also considered low.
>
> Moderate: Large areas of open forest cover where trees are clumped or thinned so that there is an average crown spacing greater than 5 feet. Ladder fuels are few. This approximates a thinned, well restored forest.
>
> High: Areas of dense forest where the canopy is closed, and crown fires are likely. Ladder fuels are present in large amounts. The high category contains many individual parcels where landowners have practiced good forest management. However, unless extensive contiguous parcels have been thinned, the Committee did not attempt to account for these in the overall assessment. Mapping of these individual parcels must wait until the smaller scale assessment is complete.

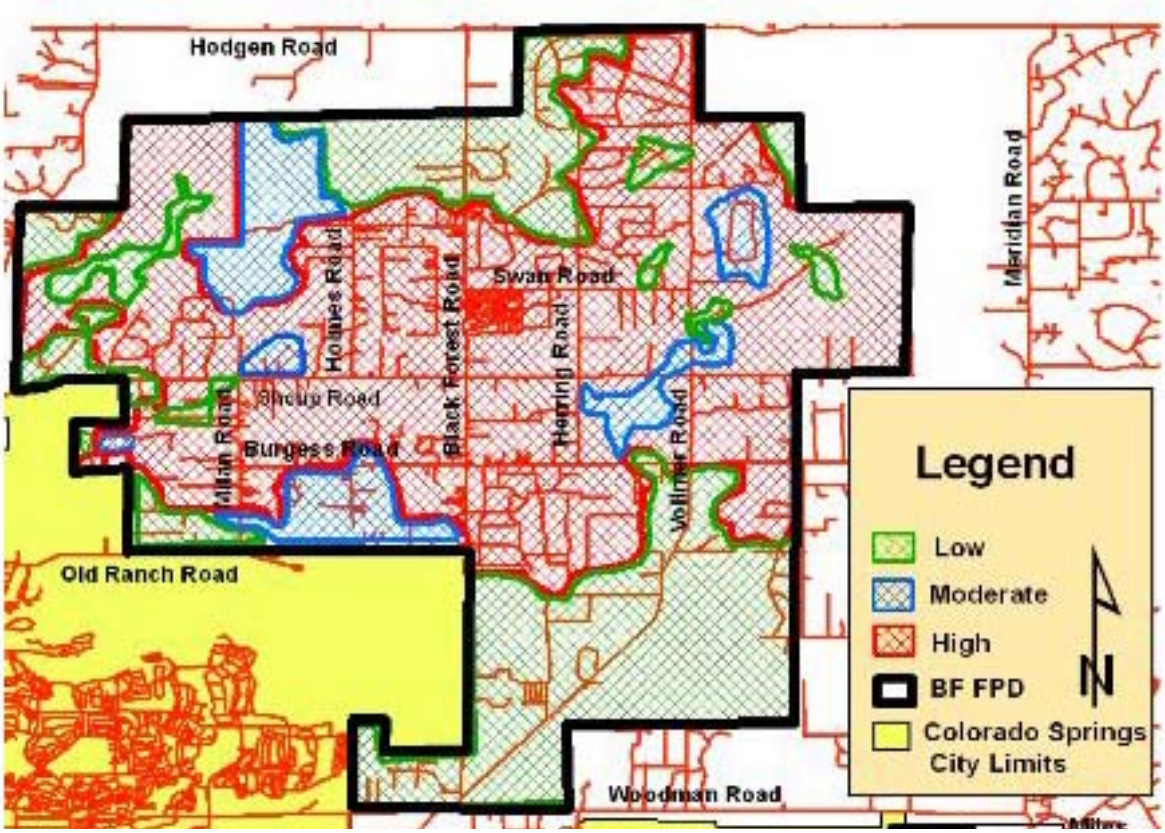

Figure 5 Black Forest CWPP Boundary Map

3.4.2.2 Planned Assessment Process

The next version of this CWPP will employ the following process.

3.4.2.2.1 Identify basis for assessment data

The Committee agreed to assess overall hazard profiles at an intermediate level and so decided to create a single general assessment for each section within the BFFRPD area. It was immediately clear that the satellite and aerial photo imagery data available through our GIS-based tools were not detailed, accurate, or recent enough to provide meaningful section-level assessments. It was decided therefore, that a new on-site assessment of each section would be performed.

3.4.2.2.2 Section Data Collection

A working group developed an assessment data collection plan and corresponding Data Collection Forms to collect data on the hazard factors in each section. Blank Section Wildfire Hazard Data Collection Forms are shown in Appendix IV. Our plan is that forty-six packages containing these section forms, a section map, and preparation instructions be given to volunteers who will be trained by BFFRPD personnel in

assessment techniques. These volunteers will visit each section to collect the data. All returned form data will be transcribed into Excel spreadsheets for summary analysis.

3.4.2.2.3. Section Wildfire Vulnerability

The six major factors (all capital letters) identified in Table 1 are intended to portray a general measure of the overall section's vulnerability to wildfire of any kind and the vulnerability of structures to damage or loss in a wildfire. Except for the "fuel breaks" entry, which applies (perhaps not perfectly equally) to an entire section, each risk factor is a composite of data collected over all section roads, structures, and topography. Please note that "fuel breaks" is in quotes because it is a shorthand for our non-traditional use of the term. Details of the process used to turn raw data into section values appear in Appendix III. In arriving at an overall risk factor, the six major factors are not equally weighted. The factors are listed in priority order, and are weighted in descending order (from 6 for Accessibility to 1 for Utilities). Thus Fire Protection, for example, is weighted as a 3.

Table 1. Section Risk Factors

Factor (Weight)	Description
ACCESSIBILITY (6)	
Ingress/Egress	Number and conditions of roads in/out of section
Average Road Widths	Road measurement in feet
Road Conditions	Road steepness and usability
Road Termini	Suitable turnaround on dead-end roads
FIRE BEHAVIOR (5)	
Fuel Density	Rating of density and type of fuels in section
Slope	Index identifying presence of significant slopes
SECTION ISOLATION (4)	
"Fuel Breaks"	Number of miles of section "fuel breaks" identified
FIRE PROTECTION (3)	
Response Time	Based on distance from Fire Department
Water Availability	Access to hydrants, pump sites, or draft sources
INDIVIDUAL PROPERTIES (2)	
Materials (predominant)	Flammability of siding and roofing
Inadequate Driveway	Driveway over 500' in length without turnaround, Or too narrow or winding for adequate access

Address Signs	Houses have visible address signs
Defensible Spaces Completed	Extent to which most structures are prepared with defensible spaces
UTILITIES (1)	
Overhead electric lines	Placement of electric lines

3.4.2.4 Section Fire Hazards

While mapping the section results will assist in the prioritization of fuels mitigation, the actual results will also be helpful in planning for each section. These data categories will be defined and trained to data collectors by fire professionals from BFFRPD. The decision was made to publicize the status of each section in the ratings, but to avoid making specific recommendations to individual sections. Categories were established to indicate the level of hazard, but individual fuels mitigation project plans should eventually be developed for each area. These results are available to the public both through this plan and through the mitigation efforts that will need to be planned and agreed to by participating residents. (See Appendix III). The information planned for this section also includes a pie chart depicting the overall risk ratings for the 46 sections.

3.4.3 Composite Section Wildfire Vulnerability

This portion of the report will provide a composite assessment, in either graphic or tabular form, of the results of Appendices II and III. It will highlight those Sections in the Black Forest that have both the highest value and the highest risk.

4.0 Preparedness to Respond

El Paso County fire departments have considerable experience responding to wildfire incidents, although much of this has been gained through supporting other County or State efforts. The several fire incident responder agencies have relatively mature capabilities, plans, resources, and infrastructure. A description of this extensive capability is beyond the scope of this CWPP but thorough documentation is available in other publications. One key document to reference is the "El Paso County Annual Operating Plan" (ELCAOP), which describes operational plans, standard operation procedures, mutual aid agreements, and cooperative agreements**.** Agencies that participate in the ELCAOP include all local Fire Departments, US Forest Service, Colorado State Forest Service, Bureau of Land Management, the City of Colorado Springs, and the National Park Service**.** Another document reference is the El Paso County FEMA All Hazards Plan.

5.0 Community Mitigation Plan: Implementation and Monitoring

5.1 Program Goals and Objectives:

We recommend that local residents, County, and State agencies cooperate in supporting programs to increase the safety and health of our forests on both private and public lands. These programs should address the following goals and objectives:

5.1.1 Reduce Fire Frequency and Severity

- Objective #1; Reduce the fuel load at strategic locations in the BFFRPD

  o Action #1; Identify model(s) for wildland fire risk analysis.
  o Action #2; Identify high risk and high priority properties within the BFFRPD (see Section 3.4.4).
  o Action #3; Develop partnerships and funding opportunities to execute the fuels mitigation projects.
  o Action #4; Support funding for the Slash/Mulch Program from private and County funds, and State and Federal grants.

- Objective #2; Improve overall health of privately owned forests

  o Action; Establish informative advocacy programs to encourage residents to improve forest conditions. Proper forest management to improve forest health will also mitigate fire hazards.

- Objective #3; Increase voluntary landowner responsibility for fuel reduction

  o Action #1; Include CWPP in Black Forest Website for public access.
  o Action #2; Strengthen public education efforts and education.
  o Action #3; Increase public awareness and support of County mitigation efforts.
  o Action #4; Collect and monitor statistics concerning BFFRPD property firewise evaluations.

5.1.2 Reduce Vulnerabilities

- Objective #1; Improve the defensibility of residential and commercial properties against wildland fire.

  o Action #1; Identify and implement programs to reduce fire loads along roads identified as evacuation routes (Black Forest, Shoup, Burgess, Vollmer, Milam, Herring, Swan, and Hodgen between Black Forest and Vollmer Roads) and along the gas pipeline to assist firefighters in keeping fires from

jumping across the barrier. A grant from the CSFS was obtained to help El Paso County to thin or eliminate trees along these roads to the full right-of-way (60'). To date, Black Forest Road (from tree-line to tree-line), Herring Road (from Burgess to Lakeview) and Burgess Roads have been completed. Adjacent landowners were notified in advance, and could negotiate keeping particular trees.) Priorities for next year include Vollmer and Swan roads. The Committee will also request Mountain View Electric to remove trees within this right-of-way as opposed to selectively topping them. These roads are also defined as primary routes for the ingress/egress of firefighting equipment.

- Action #2; Identify and institute programs create areas of fuel limitation (large defensible spaces) in certain areas of the Black Forest.
- Action #3; Implement voluntary programs for homeowners and businesses in WUI.
- Action #4; Encourage BFFRPD to enforce codes and regulations to reduce ignition potentials and increase defensibility of structures and property.
- Action #5; Encourage public education at all levels regarding forest health and wildfire occurrence as a natural hazard they can mitigate.
- Action #6; Establish Black Forest as a recognized "Firewise Community".

- Objective #2; Reduce vulnerability of critical infrastructure to wildfire impacts

  - Action #1; Identify and prioritize areas at risk.
  - Action #2; Develop and prioritize mitigation projects.
  - Action #3; Pursue funding for prioritized projects.
  - Action #4; Work with the County Department of Transportation to establish signage along principle evacuation routes.

5.1.3 Improve Alerting and Evacuation Capabilities

- Objective #1; Establish and improve mechanisms for alerting residents of the need for evacuation.

  - Action #1; Promote public awareness of the Early Warning Notification System established by the El Paso-Teller County E9-1-1 Authority.
  - Action #2; Work with the Office of Emergency Management to use the Emergency Broadcast System.

- Objective #2; Identify and prioritize escape routes.

  - Action #1; Ensure the public is informed in advance of the planned routes. These are the roads identified above by the BFFRPD: Black Forest, Shoup, Swan, Burgess, Vollmer, Milam, Herring, and Hodgen.
  - Action #2; Mark each evacuation route with adequate signage.

- Action #3; Establish responsibility within the BFFRPD for identifying specifically which evacuation route or routes should be used in a particular wildfire.
- Action #4; Encourage landowners adjacent to escapes routes to participate in thinning programs to increase the safety of the escape routes.

5.2 Implementation and Monitoring Action Plan

This first CWPP is a starting point. The implementation work lies ahead, and we recommend that the Committee take a leadership role in encouraging implementation. Besides specific initial recommendations, the Committee recommends the following actions to continually enhance the CWPP, and improve community effectiveness in accomplishing wildfire hazard mitigation in the future.

Re-charter and Reorganize the CWPP Committee. The CWPP needs to be a living document. We believe that upon acceptance and publication of the first edition CWPP, the BFCC Board and membership should continue to support a CWPP Committee.

Based on the somewhat different role, now that an initial CWPP is done and based on Committee working experience, we recommend that the BFCC Board establish a Chairperson from its membership and retain the multidisciplinary profile and citizen participation of the CWPP Committee.

The CWPP Committee should be responsible for establishing a working Task Plan that includes the Actions summarized below:

Projects Oversight: The re-chartered Committee should monitor CWPP recommendations – treating them as projects to implement the Plan. The Committee should monitor all ongoing projects' funding, timing, priorities, and progress against schedule and work to facilitate progress. A map or other suitable means may be useful in tracking progress. Project status along with recommendations should be reported to the BFCC, BFFRPD, CSFS, and El Paso County. The Committee should submit an annual report to the BFCC at its first general meeting of each year.

Special Projects: The projects for CWPP-recommended high priority areas should be treated as special collaborative projects by defining and encouraging private-land projects that will complement the public-land projects to achieve the overall objectives for threat reduction in specific areas. The Committee Chairperson should actively help drive these projects, providing the leadership to organize community groups, homeowners associations and the CWPP Committee project teams.

Citizen Information Center: Volumes of information are available for citizens to help plan and execute projects to increase safety of their communities. So much information is available in fact, that sorting through it is daunting to the average

citizen. We recommend that the Committee work with the Colorado State Forest Service to establish a specific resource – perhaps via a web site - where citizens can have one-stop-access to a set of resources specifically organized to support citizen and Home Owner Association efforts to perform wildfire threat mitigation including defensible space projects. Resources available at this "center" should include:

- Printed educational material selected specifically for Black Forest, such as SAMCOM's *Forestry Information Guide*
- Lists of sources for planning help
- List of contractors and consultants
- List of funding sources including specific guidance on how to apply for grants.

SAMCOM already maintains a large library of information for distribution at the slash/mulch site. The committee should work with SAMCOM to expand their efforts.

Publicize and Promote the CWPP: We recommend that each local agency (BFCC, BFFRPD, churches, etc.) actively help to publicize and promote the CWPP using their existing resources like publications and websites. For example, the Black Forest Festival could include a manned CWPP booth every year to help communicate with and involve our citizens. A "speakers list" may be useful so interested groups can have a standardized and sanctioned presentation on the CWPP itself and extended information on how organizations can proceed with projects. Candidate speakers are CWPP Committee members and other key people qualified for the list.

Additional promotion opportunities are publicizing good community projects, and establishing a recognition program to acknowledge projects and perhaps individuals that support the program goals. The CWPP Committee could publicize the need for action and attract volunteers by providing articles for the BFCC monthly newsletter.

Continue the Slash/Mulch Program: For over 14 years the County has sponsored a program that established a site where citizens can take slash material for disposal. This promotes individual citizen activity to reduce hazardous excessive vegetation on their property. Material is chipped into mulch at the site and made available for citizen use. The program has been very successful, growing, and effective in accomplishing its goals. Continued funding should be sought and the program continued.

Responder Needs Assessment: The Committee recommends that a project be established to support the BFFRPD in the systematic analysis of needs to improve response to wildfire incidents.

Continue Priority Area Identification: As progress is made on the initial priority areas identified in this CWPP, the Committee must continue to analyze threats

and prepare additional priority recommendations for subsequent treatment projects.

Involve Insurance Companies: To the extent possible, those property owners or areas that have succeeded in reducing the risk of their properties to wildfire should be acknowledged by their insurance companies through reduced insurance rates. Such a financial incentive may help motivate some owners to reduce risks. Insurance Companies should be encouraged to recognize the accomplishments of the Black Forest community with appropriate rating improvements and rate reductions.

6.0 Declaration of Agreement:

6.1 CWPP Committee

The members of the Black Forest CWPP Committee hereby recommend adoption of this CWPP.

MEMBER Signature

Ron Brown _____
Peter Burleson _____
Dan Gorton _____
Mary Hammel _____
Chuck Lidderdale _____
Walt Seelye _____
Ruth Ann Steele _____
Dave Ury _____

6.2 Related Organizations

Representatives from each of the following organizations have expressed concurrence with the adoption of this CWPP.

- Neighboring Fire Districts
  - Colorado Springs Fire Department
  - Donald Wescott Fire Protection District
  - Falcon Fire Protection District
  - Tri-Lakes Fire Protection District
- El Paso County Natural Resources Division
- The Bureau of Land Management
- The Slash/Mulch Committee (SAMCOM)

6.3 Formal Adoption

The following organizations participated in the development of the document, and adopt this CWPP for the Black Forest community.

Black Forest Fire/Rescue _____
Black Forest Community Club _____
Colorado State Forest Service _____
El Paso County (BoCC) _____

APPENDIX I

SECTION IDENTIFICATION

El Paso County uses the standard state identification (Range, Township, and Section) nomenclature, but also has generated a shorter (5 digit) version based on R, T, and S, that appears within County-supplied map sections. Since our section assessment volunteers are using these maps, this appendix both provides a cross-reference between the R, T, and S identifiers and the five-digit version, as well as a text description by which readers may identify sections of interest.

For those interested, this paragraph defines how the five-digit form is generated from the R. T, and S. First, directional suffixes (W and S) are dropped from the R and T. Second, the leading digit is dropped from the "R" (all are 6's). Third, the leading digit is dropped from the "T" (all are 1's). Next, a zero is added at the end of the S. And finally, the order of the R and T are reversed. Thus, R65WT16SS4 becomes 65040.

#	R	T	S	Ref	Description
1	65	11	28	51280	SW of Vollmer and Hodgen
2	65	11	29	51290	SE of BFR and Hodgen
3	65	11	30	51300	SW of BFR and Hodgen
4	65	11	31	51310	W of BFR; Connaught Drive
5	65	11	32	51320	E of BFR; W of Tannenbaum
6	65	11	33	51330	Tannenbaum; Wildridge
7	65	11	34	51340	Coachman
8	65	12	02	52020	Headwaters of Snipe Creek
9	65	12	03	52030	NE of Vollmer and Swan
10	65	12	04	52040	NE of Swan and Herring
11	65	12	05	52050	NW of Swan and Herring
12	65	12	06	52060	NW of BFR and Elementary
13	65	12	07	52070	NW of BFR and Shoup
14	65	12	08	52080	Brentwood (SE of BFR and Swan)
15	65	12	09	52090	NE of Shoup and Herring
16	65	12	10	52100	NE of Shoup and Vollmer
17	65	12	11	52110	NE of Shoup and Blue Spruce
18	65	12	15	52150	NE of Burgess and Vollmer
19	65	12	16	52160	School Section
20	65	12	17	52170	NW of Burgess and Herring
21	65	12	18	52180	NW of BFR and Burgess
22	65	12	19	52190	SW of BFR and Burgess
23	65	12	20	52200	SE of BFR and Burgess
24	65	12	21	52210	SW of Burgess and Vollmer
25	65	12	22	52220	SE of Burgess and Vollmer
26	65	12	27	52270	NW of Raygor and Stapleton
27	65	12	28	52280	Vollmer and Wildflower

28	65	12	29	52290	SE of BFR and Baker
29	65	12	32	52320	Vollmer, Azare Road
30	65	12	33	52330	E of BFR (1-2mi) and N of Woodmen (1-2mi)
31	65	12	34	52340	SW of Stapleton and Tomahawk
32	65	13	06	53060	NW Corner of BFR and Woodmen
33	66	11	25	61250	Hodgen and Farrar Drive
34	66	11	26	61260	Hi Forest Ranch
35	66	11	35	61350	W of BFR (2-3mi) and S of Hodgen (1-2mi)
36	66	11	36	61360	W of BFR 1-2mi) and S of Hodgen (1-=2mi)
37	66	12	01	62010	Cathedral Pines (W of Holmes)
38	66	12	02	62020	Cathedral Pines
39	66	12	03	62030	E of Rt 83; W of Cathedral Pines
40	66	12	10	62100	NE of Shoup and Rt 83
41	66	12	11	62110	N of Shoup; Peregrine
42	66	12	12	62120	NW of Shoup and Holmes
43	66	12	13	62130	SE of Shoup and Milam
44	66	12	14	62140	SE of Shoup and Howells
45	66	12	23	62230	SE of Burgess and Milam
46	66	12	24	62240	NE of Milam and Old Ranch

APPENDIX II

SECTION VALUE INDICES

In order to help properly establish priorities for risk remediation, some concept of section value is needed. The purpose of this appendix is to provide such guidance. As already noted in Section 3.4.1, one must realize at the outset that this is an attempt to think the unthinkable, and to value the invaluable – namely to say that if a wildfire were to destroy all the property within a section, how would one prioritize the loss of that against some other section. To its owner, the loss of one individual parcel can range from catastrophic to minor, depending upon factors such as insurance, whether or not there is a dwelling on the parcel, one's individual finances, etc. One also must work with some version of "official" as opposed to subjective data.

We have collected from the El Paso County Assessor's Office the data in the second through the fourth columns on the subsequent page (the first is just a reference number). The second column labeled "Section ID" is the section reference from column five of Appendix I, used by the county to identify sections. The next three columns are the number of parcels in each section (assumed for our purposes to represent the number of dwellings), total market value of each section as reported by the Assessor's office, and total assessed section value.

The Committee immediately realized that simply using total value as a single measure would be inappropriate, since the loss of one $900,000 "mansion" should not count as equal to the loss of three $300,000 dwellings. We therefore created columns identifying both the relative number of parcels and relative values for each section. To do this, we added up the total number of parcels and divided by the number of sections to calculate the average number of parcels per section within the BFFRPD area. Then we divided the number of parcels in each section by this average to obtain a "Parcel Factor" – a number indicating the density of parcels relative to the average. We also calculated a "Value Factor", using Market Values in a corresponding manner. (It may be of interest to point out that the total market value of properties within this area, according to the assessor's office, is over $900 million dollars!) Note that if all sections were completely homogeneous – i. e. if every section had the same number of parcels with the same aggregate market value, then all these factors would be exactly one. The next column is the product of the two preceding columns, and represents our (admittedly somewhat subjective) attempt to calculate a single value combining the number of parcels with total market value. While we recognize that no approach is perfect, we have assigned priorities in the following table as 1, 2, or 3, with 1 being the highest. The fifteen sections with a value index of one all have a PF x VF score above 1.6. The fifteen sections ranked with a two all have a PF x VF score above 0.4. The remaining 16 had a score below 0.3. For the mathematically inclined:

PF(i) = 46xNo. Of Parcels (I) /Sum from 1 to 46 of No. of Parcels (I)

VF (I) = 46xMarket Value (I)/Sum from 1 to 46 of Market Value (I)

#	Parcel ID	No of Parcels	Market Value	Assessed Value	PF	VF	PF x VF	Val Indx
1	51280	114	$31,601,729	$2,728,600	1.43	1.60	2.27	1
2	51290	89	$20,800,072	$1,923,820	1.11	1.05	1.17	2
3	51300	1	$12,990	$3,770	0.01	0.00	0.00	3
4	51310	37	$6,434,325	$868,420	0.46	0.32	0.15	3
5	51320	61	$16,794,444	$1,438,490	0.76	0.85	0.65	2
6	51330	102	$33,147,747	$2,774,160	1.28	1.67	2.13	1
7	51340	102	$32,962,618	$2,864,180	1.28	1.66	2.12	1
8	52020	1	$355,589	$36,130	0.01	0.02	0.00	3
9	52030	48	$15,805,526	$1,488,820	0.60	0.80	0.48	2
10	52040	143	$37,105,132	$3,156,730	1.79	1.87	3.35	1
11	52050	93	$26,221,087	$2,160,480	1.16	1.32	1.54	2
12	52060	131	$29,061,803	$2,261,920	1.64	1.47	2.40	1
13	52070	107	$24,810,110	$2,150,320	1.34	1.25	1.68	1
14	52080	238	$29,835,010	$2,565,190	2.98	1.51	4.48	1
15	52090	109	$24,276,291	$2,133,510	1.36	1.23	1.67	1
16	52100	5	$768,568	$58,060	0.06	0.04	0.00	3
17	52110	32	$7,771,154	$770,410	0.40	0.39	0.16	3
18	52150	100	$29,881,703	$2,436,160	1.25	1.51	1.89	1
19	52150	85	$22,158,446	$1,988,170	1.06	1.12	1.19	2
20	52160	2	$2,490,013	$1,730	0.03	0.13	0.00	3
21	52170	105	$22,403,232	$1,844,570	1.31	1.13	1.49	2
22	52180	85	$18,672,791	$1,668,340	1.06	0.94	1.00	2
23	52190	88	$22,587,864	$2,389,970	1.10	1.14	1.25	2
24	52200	199	$58,268,162	$4,144,390	2.49	2.94	7.32	1
25	52210	77	$18,914,946	$1,657,950	0.96	0.96	0.92	2
26	52220	79	$15,536,897	$1,856,200	0.99	0.78	0.77	2
27	52270	43	$9,489,899	$838,320	0.54	0.48	0.26	3
28	52280	31	$10,158,173	$847,160	0.39	0.51	0.20	3
29	52290	250	$41,468,421	$4,277,720	3.13	2.09	6.54	1
30	52290	127	$43,032,314	$3,910,110	1.59	2.17	3.45	1
31	52320	27	$7,037,594	$1,096,260	0.34	0.36	0.12	3
32	52340	12	$2,419,880	$225,300	0.15	0.12	0.02	3
33	53060	201	$9,879,587	$1,543,520	2.51	0.50	1.25	2
34	61250	26	$8,412,904	$1,360,190	0.33	0.42	0.14	3
35	61260	175	$80,154,499	$9,156,490	2.19	4.05	8.86	1
36	61350	1	$31,282	$9,070	0.01	0.00	0.00	3
37	61360	1	$22,348	$6,480	0.01	0.00	0.00	3
38	62010	121	$15,523,686	$2,104,750	1.51	0.78	1.19	2
39	62020	43	$4,084,014	$1,036,070	0.54	0.21	0.11	3
40	62030	13	$3,847,522	$309,840	0.16	0.19	0.03	3
41	62100	27	$15,713,510	$1,631,790	0.34	0.79	0.27	3
42	62110	92	$42,169,863	$3,973,180	1.15	2.13	2.45	1
43	62120	65	$17,613,995	$1,583,140	0.81	0.89	0.72	2
44	62130	63	$16,190,853	$1,394,120	0.79	0.82	0.64	2
45	62230	79	$21,993,349	$2,138,640	0.99	1.11	1.10	2
46	62240	106	$29,611,491	$2,519,420	1.33	1.50	1.98	1
	SUM	3,622	$895,931,704		45.28	45.25	67.15	
	AVG	80	$19,909,593		1.01	1.01	1.49	

APPENDIX III

SECTION RISK INDICES

The companion analysis to Appendix II is an examination of the risk that each Section faces of Crown fire. This appendix represents our concept for the factors that contribute to this risk. We have not yet developed algorithms appropriate to summarize a) the basic (10) factors into the major (6) factors identified below, or b) the major factors into an overall conclusion (the column labeled "Index") for each of the 46 Sections. The six major factors are listed left to right below in order of priority. The data in this Appendix is based on the raw data collected by volunteers and identified in Appendix IV.

Section ID	Access	Fire Beh.	Isol.	Fire Prot	Property	Util.	Index

APPENDIX IV

SECTION WILDFIRE HAZARD DATA COLLECTION FORM

Section assessment: Indoor

Range:___ Township:____ Section:____ Ref. No. _____
Date(s) assessed:_____ to _____
Data gathered by: _____
_____
_____

Fire break miles bordering or within this section: _____
Primary road miles bordering or within this section: _____
Water supply
Number of water sources within 3 miles: _____
Number of water sources within 5 miles: _____
Distance to nearest fire station: _____
What fire station is it?_____
Topography
Estimate from topographical map

	% of section:
< 8% slope:	_____
9-20% slope:	_____
21-30%	_____
> 30%	_____

Vegetation

Estimate from satellite imagery	**% of section:**
Grass with scattered trees or brush:	_____
“Thinned” conifers (10 ft. or more between trees)	_____
Dense, continuous conifers and/or thick brush	_____

Evacuation route choices
In how many directions may people leave this section?
4 North, south, east, or west
3 Any three directions
2 Any two directions
1 One direction only

BFCWPP Land Section Assessment: Drive-through Survey Report

County Assessor's Land Section Prefix Number (5-digits on aerial photo): _____ (please enter on all pages)

Dates of Drive-through Survey: From: _____ to _____

Data gathered by Name: _____ Phone: _____ Name: _____ Phone: _____

Page ____ of ____ (*names, phone numbers and dates needed on first page only)*

Road Name (or describe other fire break)	**Dead – end Road? (Y,N)**	**Road >=24'? (1 rope) (Y, N)**	**Turn-around >= 45' (2 rope) (Count)**	**High - Med Tree Density (Count)**	**Overhead power crossing or beside road (Count)**	**Houses visible (Not Incl Outbldgs) (Count)**	**Vegetation < 30 feet from houses (Count)**	**Bad Access: Narrow Driveway, Twisty, Gates, => 500', Dog (Count)**	**Wood shingle Roofs (Count)**	**Asphalt shingle roofs (Count)**	**Wood Siding Or Deck (but not log) (Count)**	**Busi-nesses (Count)**	**Community Asset(s) (Name(s))**

APPENDIX V

FIREWISE GUIDELINES

TREE SPACING – RULE OF THUMB
Strive to reduce crown density to 40% or less.

<u>Ponderosa Pine/Douglas Fir</u>: Convert stem diameter from inches to feet and add 6 more feet.

> **Example:** A Ponderosa Pine 8" dbh (diameter at breast height, about 4½ feet above the ground)*(diameter = circumference x 0.31831)* will have a spacing of 8 feet plus 6 feet for a total of 14 feet to the next tree.

The spacing does not need to be even. In fact the fuel treatment area will look more natural if the spacing varies and small clearings are intermingled with small stands of trees. The important focus should be on breaking up fuel continuity – horizontal and vertical.

When selecting trees for thinning, consider:

- **Quality** – trees' health and vigor. Healthy trees have straight trunks, conical tops, and large amounts of green needles;
- **Tree Size** – strive for a mixture of sizes;
- **Spacing** – crowns should not touch, best 5'-10' apart;
- **"Character" Trees** – unique in shape, historical, stand out, or hide undesirable views;
- **Mixed Species** – preserve mixed species, if you have them, to protect against losing everything to a single pest.

Begin nearest your house to protect it first. Create at least 30' of defensible space (more on a slope) with no trees or widely-spaced trees, low (4") ground cover, and fire-resistant shrubs. Then proceed to thin outward.

An important part of fuel hazard reduction is removal of the ladder fuels, particularly when adequate thinning cannot be accomplished. Therefore, the following is important to do within a timber canopy:

> **Prune trees up to 8 to 10 feet depending on slope. On trees less than thirty feet tall always leave at least two-thirds of the green branches**
> **Remove under story reproduction**
> **Remove sagebrush, oak or any other flammable brush**
> **Remove all dead forest debris**

Remove trees recently killed by mountain pine beetle or any other disturbance

Stage the thinning work over a long enough time to allow the standing trees to develop their wind firmness. Thinning when trees are small helps prevent this blow down vulnerability. Thinning in patches and designing the thinning to minimize wind effect can be done depending on location. All of these can best be accomplished with the assistance of an experienced forester.

Note: All slash disposal procedures should be implemented to avoid attracting mountain pine bark beetle to the project area.

For more information, visit these local websites:

Black Forest Fire/Rescue Local tips for preparing for wildfire. Download the brochure "Wildfire... Are You Prepared?"	http://www.bffire.org
Slash-Mulch to collect what you cut	http://www.bfslash.org
The FireWise web site A wealth of wildfire information, defensible space advice, and preparation tips.	http://www.firewise.org
Colorado State Forest Service – Protect Your Home and Forest section	http://csfs.colostate.edu/protecthomeandforest.htm
U.S. Forest Service: Rocky Mountain Area Coordination Center This page includes links to all information below:	http://gacc.nifc.gov/rmcc/
U.S. Drought Monitor	http://www.drought.unl.edu/dm/monitor.html
The Fire Weather and Intelligence Page Everything you ever wanted to know about wildfire potential and activity in the Rocky Mountain region.	http://www.blm.gov/colorado/rmafwx/index.html
Observed Fire Danger Class	http://www.fs.fed.us/land/wfas/fd_class.gif
Fire Weather Outlook Visual summary of weather conditions	http://www.fs.fed.us/r2/fire/rmafwx.png
Fire Weather Forecast Detailed text report of local fire weather is provided by the Pueblo Dispatch Center (Black Forest is Zone 226)	http://fire.boi.noaa.gov/firewx/denfwfpub.html

You can pick up Firewise information at the Black Forest Fire Department.

For a free Firewise Assessment from a uniformed Fire Department volunteer, e-mail *firewise@bffire.org* to set up an appointment.

APPENDIX VI

DEFINITONS/GLOSSARY OF TERMS

Age Class – A classification of trees of a certain range of ages.

Aspect – The direction in which any piece of land faces.

Biological Diversity – The variety of living organisms considered at all levels of organization, including the genetic, species, and higher taxonomic levels, and the variety of habitats and ecosystems, as well as the processes occurring therein.

Bole – The main stem or trunk of a tree.

Canopy – The more or less continuous cover of branches and foliage formed collectively by adjacent trees and other woody species in a forest stand. Where significant height differences occur between trees within a stand, formation of a multiple canopy (multi-layered) condition can result.

Citizen Safety Zone – An area that can be used for protection by residents, and their vehicles, in the event that the main evacuation route is compromised. The area should be maintained, clear of fuels and large enough for all residents of the area to survive an advancing wildfire without special equipment or training.

Coarse Woody Material – Portion of tree that has fallen or been cut and left in the woods. Pieces are at least 16 inches in diameter (small end) and at least 16 feet long.

Cohort – A group of trees developing after a single disturbance, commonly consisting of trees of similar age, although it can include a considerable range of tree ages of seedling or sprout origin and trees that predate the disturbance.

Community Assessment – An analysis designed to identify factors that increase the potential and/or severity of undesirable fire outcomes in WUI communities.

Crown Class – A class of tree based on crown position relative to the crowns of adjacent trees.

Crown Fire – Fire that advances through the tops of the trees.

DBH – Diameter at breast height.

Defensible Fuel Reduction Zones – Areas of modified and reduced fuels that extend beyond fuel breaks to include a larger area of decreased fuels. These would include

managed stands with reduced amounts, continuities, and/or distributions of fuels that would provide additional zones of opportunity for controlling wildfire.

Defensible Space – An area around a structure where fuels and vegetation are modified, cleared or reduced to slow the spread of wildfire toward or from a structure. The design and distance of the defensible space is based on fuels, topography, and the design/materials used in the construction of the structure.

Density Management – Cutting of trees for a variety of purposes including, but not limited to: accelerating tree growth, improved forest health, to open the forest canopy, promotion of wildlife and/or to accelerate the attainment of old growth characteristics if maintenance or restoration of biological diversity is the objective.

Dominant – Crowns extend above the general level of crown cover of others of the same stratum and are not physically restricted from above, although possibly somewhat crowded by other trees on the sides.

Co-Dominant – Crowns form a general level of crown stratum and are not physically restricted from above, but are more or less crowded by other trees from the sides.

Down, Dead Woody Fuels – Dead twigs, branches, stems, and boles of trees and shrubs that have fallen and lie on or near the ground.

Extended Defensible Space – A defensible space area where treatment is continued beyond the minimum boundary. This zone focuses on forest management with fuels reduction being a secondary consideration.

Fire Behavior Potential – The expected severity of a wildland fire expressed as the rate of spread, the level of crown ire activity, and flame length. Derived from fire behavior modeling programs utilizing the following inputs: fuels, canopy cover, historical weather averages, elevation, slope and aspect.

Fire Hazard – The likelihood and severity of Fire Outcomes (Fire Effects) that result in damage to people, property, and/or the environment. Derived from the Community Assessment and the Fire Behavior Potential.

Fire Mitigation – Any action designed to decrease the likelihood of an ignition, reduce Fire Behavior Potential, or to protect property from the impact of undesirable Fire Outcomes.

Fire Outcomes (Fire Effects) – A description of the expected effects of a wildfire on people, property and/or environment based on the Fire Behavior Potential and physical presence of Values-At-Risk. Outcomes can be desirable as well as undesirable.

Fire Risk – The probability that an ignition will occur in an area with potential for damaging effects to people, property and/or the environment. Risk is based primarily on historical ignitions data.

Fuel Break – A natural or constructed discontinuity in a fuel profile utilized to isolate, stop or reduce the spread of fire. Fuel breaks may also make retardant lines more effective and serve as control lines for fire suppression actions. Fuel breaks in the WUI are designed to limit the spread and intensity of crown fire activity.

Hazard – The combination of the wildfire hazard ratings of the WUI communities and the fire behavior potential as modeled from the fuels, weather and topography of the study area.

Intermediate – Trees are shorter, but their crowns extend into the general level of dominant and co-dominant trees, free from physical restrictions from above, but quite crowded from the sides.

Risk – The likelihood of an ignition occurrence that results in a significant fire event.

Shelter-In-Place – A method of protecting the public from an advancing wildfire involving instructing people to remain inside their homes or public buildings until the danger passes. This concept is a dominant modality for public protection from wildfires in Australia where fast moving, short duration fires in light fuels make evacuation impractical. The success of this tactic depends on a detailed preplan that takes into account the construction type and materials of the building used, topography, depth and type of the fuel profile, as well as current and expected weather and fire behavior.

Suppressed – Also known as overtopped. Crowns are entirely below the general level of dominant and co-dominant trees and are physically restricted from immediately above.

Values-At-Risk – People, property and environmental features within the project area which are susceptible to damage from undesirable fire outcomes.

APPENDIX VII

SLASH TREATMENTS

Slash is the material left after any useable wood is removed from a forest restoration project. It usually consists of branches and tree tops that are too small in diameter to use, but may include larger diameters of wood. Proper clean up of slash is essential to reduce fire hazard, maintain aesthetic values and for forest health. Following is a brief list of the slash treatments most commonly available to landowners.

Lop and Scatter:

This treatment consists of using the chainsaw to cut the slash into small pieces so that the height of the remaining slash is 6 inches or less. It may be the only practical treatment in areas where chippers are unavailable or prohibitively expensive. It is usually the lowest cost treatment since no special equipment, other than a chainsaw, is needed.

The treated slash is left to decompose. Over the course of several winters, snow pack pushes the slash down and it becomes unnoticeable. This process usually requires three to five years. . It is the most aesthetically unappealing since the slash remains visible until it breaks down.

Lop and scatter should not be used in the defensible zones around structures since the woody material will burn in the event of a fire. The increased fire risk is most prevalent until the needles fall off the wood, but persists until the slash is on the ground and decomposing. In areas away from structures, the slight increase in ground fuel is still a great improvement over the risk of crown fires in an untreated stand. Often lopped and scattered slash is broadcast burned at a later date.

Lopped and scattered slash can also lead to problems with *ips* beetles. The beetles may lay eggs in green slash and the resultant brood may emerge to attack living trees. This problem can be alleviated by doing any forest restoration treatments requiring this method in the fall and winter when ips are not active and by cutting slash into small pieces that dry out quickly.

Chipping:

Chipping in this context refers to chipping the remaining slash after the trees have been cut and removed for a wood product. Masticating machines, on the other hand, usually chip whole trees as part of the harvest operation itself.

This method may be very labor intensive if the slash must be carried to the chipping machine by hand. As more labor is required to accomplish the task, the cost will rise. On difficult terrain, where slash must be hauled long distances to the chipper this may be a cost prohibitive method.

Chipping is the most common method of slash disposal in the defensible zones around structures. Chips do not significantly contribute to fire hazard around structures since they are close to the ground. They may smolder, but do not produce any significant flame. Large piles of chips should be avoided as they could smolder for a significant amount of time. Chips should be spread along the ground to a depth of less than four inches.

Chipping is an effective means of treating wood infested with bark beetles since the insects will not survive in the small bits of wood. Green slash that is promptly chipped will not harbor infestations of *ips* or other bark beetles.

Chippers are available from many equipment rental businesses, although the rental tends to be expensive and the homeowner must have a vehicle capable of towing a machine. Many communities own chippers and will make them available to landowners doing defensible space projects. Local fire protection districts usually have this information.

Pile and Burn:

Any form of open burning requires a permit, and burning must be done only under the conditions stipulated in the permit. The permitting process varies from county to county. Local fire departments will be able to tell a landowner how to obtain a permit.

For most landowners the slash is piled by hand and burned when conditions are safe—usually a certain amount of snow on the ground. Piles burn best when they are compact and the height is greater than the diameter. This arrangement promotes hotter burning and less smoke.

Location of burn piles is important as well. Piles should be located as far away from standing trees as possible. Even when burning in the winter it is possible to scorch living trees from the heat of the burning pile. Avoid making burn piles on top of stumps. The fire could smolder long distances through the roots of the stump.

The green branches and wood placed in piles will be left in branch lengths long enough to dry out. As a result, piles carry the risk of harboring broods of *ips* beetles which may emerge to attack living trees. On the other hand, burning is an ideal method of killing any bark beetles infesting the wood.

Often piles from wood cut one winter must sit through the following summer in order to dry, or piles from one season may be left over the next summer if proper burning conditions were not available during the winter. In each case the dry wood piles will sit through a burning season with the risk of ignition.

The fire should be monitored during the day and for several days thereafter. The center of a pile usually burns completely, but often wood around the edges does not. To ensure that the slash at the edge of each pile burns it is necessary to “chunk in” the piles

periodically. This means that as the fire at the middle of the pile burns down, wood from the edges should be thrown into the center to insure complete burning of all slash.

For several years after a pile is burnt, an unsightly black ring remains where the heat of the fire scorched the soil. Many landowners find these unpleasant to look at. They may also present an opportunity for noxious weed to colonize the bare soil. Breaking up the bare soil with a rake and reseeding with native plants is recommended.

Broadcast Burning:

This method is more often used by government agencies with extremely large tracts of land than by private landowners. No landowner should attempt a broadcast burn without consulting an individual with expertise in planning and executing broadcast burns.

The permitting procedure for a broadcast burn is quite complex. Smoke management is often the most difficult part of the process. Smoke from a fire must be carefully controlled to minimize annoyance to the public. Broadcast burns must be done under carefully prescribed weather conditions. Burns can be delayed for years if the proper conditions do not occur. Depending on the circumstances, broadcast burns may require large numbers of personnel to hold the fire. Often, such burns are done with the assistance of local fire protection districts as training exercises.

Once the difficulties are overcome, however, broadcast burning may be the best method of accomplishing forest restoration as well as slash treatment. Light fire on the ground is nature's way of maintaining ponderosa pine or mixed ponderosa and Douglas-fir forests. It should be noted that lodgepole pine types and spruce/fir types are adapted to a fire regime of infrequent, stand replacement fires, and broadcast burning may not be suitable in these types.

Unlike chipping or lop and scatter methods which still leave fuel, albeit in a modified condition, burning consumes the slash. Once burned, there is no longer any fuel to feed a wildfire. Broadcast burning, unlike other methods leaves a seed bed ideal for regeneration of new trees.

On the other hand, broadcast burning, by removing the existing ground vegetation may also encourage invasion of noxious weeds. Burned areas should be carefully monitored after burning. Usually the heat produced by broadcast burning does not damage the soil and reseeding is not necessary. Green slash left to cure over the warm season may also be a brood site for *ips* beetles.