Community Wildfire Protection Plan: Living with Fire in Ashland

Executive Summary

The displacement of Native Americans in the 19th century began an era of change in fire-adapted forests of the west. Settlement land use practices and the control of naturally occurring wildfire has altered historic fire cycles. Vegetation has changed from more open conditions composed of fire adapted species to dense forests composed of fire intolerant species. The result is increased risk of large-scale, high-intensity wildfires that threaten forest ecosystems adapted to lower intensity fires (Agee, 1993). In the Ashland Creek watershed, our municipal water supply and late-successional forest habitat are at risk due to the increasingly homogenous composition of forests. Also at risk are lives, property, and infrastructure where development intermixes with forest lands.

The Ashland Community Wildfire Protection Plan (CWPP) is the result of community wide fire protection planning and the compilation of project documents developed by the staff and citizens of the City of Ashland relative to managing private and public land in and adjacent to the Ashland Creek Watershed. This plan was compiled in the summer of 2004 in response to the federal Healthy Forests Restoration Act of 2003 (HFRA). A key element of this plan addresses the proposed US Forest Service Ashland Forest Resiliency Project (AFR) in the Upper Bear Creek watershed.

Our CWPP meets the requirements of HFRA by:

1) proposing alternative locations and methods of treatments on federal land in our watershed,
2) prioritizing fuels reduction across the landscape,
3) addressing structural ignition, and
4) working with Oregon Department of Forestry, US Forest Service, and local fire officials

This document goes much further by planning for the safety of life and property in the wildland/urban interface and by upholding ecological values of the community.

The City of Ashland Forest Lands Commission, in conjunction with local conservation groups, individual citizens, and city staff has worked for over five months on the details and organization of this plan. Weekly sub-committee meetings, email threads, a public forum, and a presentation to the Ashland City Council all took place between May and October of 2004. The effort and time put forth on this plan has been extraordinary. Even more remarkable has been the collaboration among this diverse and very able community coalition.

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

Goals of the plan:

- Summarize and review regulations, past plans, community values, and actions as they relate to wildfire and forest management in our community and watershed.

- Present a community vision and plan for restoring resiliency to the forests of the watershed as allowed under the Healthy Forests Restoration Act of 2003.

- Analyze issues of community wildfire safety and make recommendations for increasing community wildfire preparedness.

- Identify actions to decrease community wildfire hazards.

The Community Wildfire Protection Plan (CWPP) is a living document meant for review and revision as the needs of the community change over time. The last chapter contains all the Action Items identified throughout the plan so specific actions can be tracked. The Action Items include who is accountable, a timeline, and identification of funding.

Homeowners and decision-makers alike will find the recommendations for wildfire preparedness outlined in Chapters 5 through 7 and the related documents in the appendix very useful. Information on Ashland's Wildfire Fuels Reduction Program is contained in Chapter 4.

Chapter 8 contains a detailed proposal developed by community members as an alternative to the US Forest Service Ashland Forest Resiliency Project. This plan, crafted by volunteer professional forest and ecology scientists within our own community, outlines a strategy addressing the risk of large scale, stand replacing fire in the watershed. The alternative plan is referred to as the Ashland Forest Resiliency Community Alternative (AFRCA). The AFCRA is specifically designed to meet the purpose and need statement established by the Ashland Ranger District as well as the requirements for an alternative as defined in the HFRA.

The wildfire threat to the city of Ashland and our surrounding watershed is manageable if we work together to address the issues. Local fire agencies are excellent resources for wildfire information and assistance. It is only through the combination of homeowner actions, community awareness, and firefighting capabilities that we will reduce wildfire hazard. All of these elements are incorporated into the Ashland Community Wildfire Protection Plan.

Table of Contents

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

Appendix
Items Available on City Website (www.ashland.or.us) under the Fire and Rescue Homepage and CWPP. Chapter 8 Appendix is located within the chapter.

Introduction

Fire in forests has been an integral process in the renewal and diversification of the landscape for millennia (Agee, 1990). Plants and animals have developed strategies for survival over time with fire as a frequent visitor. Since European settlement of western North America, our culture has become less and less adapted to life with fire. We have excluded fire in forests where it is ecologically desirable, and simultaneously increased the wildfire danger in and around our communities.

In our local area, well-intentioned efforts to exclude fire in the uninhabited parts of the Ashland Creek watershed have had negative effects on the ecological integrity of low to mid elevation forests. The development of homes and infrastructure into these forests has put residents, firefighters, and structures in the path of fire. Research and experience suggest that fire and humans can co-exist on a landscape if we change cultural misconceptions and put in place proper planning and precautions.

Ashland's stake in the quality of drinking water derived from Ashland Creek is as clear as the water itself. The production and protection of our municipal watershed will continue to drive our local social, political and ecological thinking far into the future. This Community Wildfire Protection Plan further reinforces our standing as active partners in all future decisions and management actions proposed and taken in our watershed. The community's work on wildfire protection and watershed management has been extraordinary in time and dedication. Our desire to work as a partner in watershed management with the Forest Service is unwavering. The growth of collaboration and dialogue between city government, the community, and Ashland Ranger District is essential to successful stewardship of the watershed.

An inherent dichotomy exists within this CWPP; a strong desire to prevent, suppress, and prepare for fire where it threatens lives and properties opposes the imminent need to restore fire as a key ecological process in the long-term health of our watershed. This dichotomy reflects the public desire to reside safely in a forest landscape that has evolved with frequent fires. In and near the city, a single goal applies across yards and homes: *protect lives and property*. Once the immediate threat to the community is removed, we face more complicated challenges. The restoration of a natural landscape-scale patch diversity and fire regimes is an outcome few (if any) managers have accomplished on a watershed scale. Nevertheless, we are pursuing this end with respect and humility realizing that the current set of conditions reflects an interruption of ecological cycles and functions that evolved over hundreds of years.

CWPP Planning Process

Many components of this plan existed prior to 2004 and were coalesced into this work to satisfy requirements of the Healthy Forests Restoration Act of 2003 (HFRA). The Ashland Ranger District-Rogue River/Siskiyou National Forest, under the HFRA authority, proposed a project in the Ashland watershed called the Ashland Forest Resiliency (AFR) and described in a scoping letter dated February 27th, 2004. This Forest Service letter set in motion the process for the community and City of Ashland to develop a CWPP, including an alternative to the AFR project, by April 30, 2004 - a date set by the Forest Service under the HFRA guidelines.
A coalition of local government entities, environmental organizations, and individual citizens assembled in April to begin the process of collaborative development of the CWPP. These groups included the City of Ashland via the Ashland Forest Lands Commission (a volunteer commission which advises City policy on forestland and watershed issues), Headwaters,

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

Klamath-Siskiyou Wildlands Center, and the World Wildlife Fund. The feeling from many participants was that the process was unduly truncated due to the Forest Service deadline. With less than three weeks to offer a viable plan to the USFS, public meetings were quick and furious. Other meetings among coalition members and citizens took place during the month of April formulating the necessary CWPP elements and the watershed treatment alternative. Meetings of the Ashland Forest Lands Commission addressed the CWPP on April 14, 22, and 29. All meetings were announced in the media and open to the public.

A draft CWPP, complete with recommendations for managing the Ashland Creek watershed, was submitted on April 30th, 2004 as required. It was determined by the Forest Service to be an acceptable CWPP, meeting the requirements set out in the HFRA of 2003. However, the Forest Service did not find sufficient detail in the Ashland Forest Resiliency Community Alternative (AFRCA) proposal to satisfy planning requirements on federal lands.

In a positive move toward collaborative stewardship, the USFS granted an extension until October 1, 2004 for the community to refine the "community alternative" by designating the specific locations, extent, and prescriptions for the thinning to be done in the watershed. Two committees were then created to accomplish separate tasks: the *Tech Group* to refine the community watershed alternative as described above and the *CWPP Steering Committee* to further develop the community aspects of the CWPP document related to wildfire planning, policy, response, and recovery in the inhabited land of the planning area. Each committee met weekly through the summer to accomplish tasks set forth by the larger group. The Tech Group obtained data and GIS layers from the Forest Service to aid mapping of the alternative proposal while developing treatment prescriptions for specific plant communities. The Steering Committee further developed the community safety aspects of the CWPP while enhancing the readability of the document. These efforts culminated in September with posting of a draft CWPP on Sept. 2, a public forum on Sept. 9, and a presentation to the City Council on Sept 21.

Understanding This Document

This plan incorporates many existing documents relating to wildfire in Ashland in an attempt to create a single resource for citizens, policy makers, and public employees. Because of the variation in format, language, and subject matter in these auxiliary documents, they are included in their entirety in the appendix. This approach makes the front end of the actual plan more readable while establishing a reference source for documents related to wildfire planning and forest management.

The text and organization of this plan are meant to guide all citizens, especially those who live in the highest risk areas. This work is also designed to inform city staff, the city council and all of our watershed partners both public and private. The use of specialized terminology is minimized except in Chapter 8, which necessarily offers a scientifically precise forest management alternative as part of our community plan.

Action items are identified in each chapter and summarized in Chapter 10 along with proposed courses of action. Maps referenced in text are displayed on the next page for quick viewing.

Chapter 1 Ashland's Geographical and Ecological Setting

The City of Ashland, Oregon is situated in the Siskiyou Mountains sixteen miles from the California border. The topography in and around Ashland is highly dissected into steep drainages and narrow ridges. Ashland Creek flows through downtown Ashland and provides drinking water to the city from Reeder Reservoir, which is located two miles upstream from the city (see Map 1). Rainfall in Ashland averaged 19.15 inches per year from 1948-1992. The annual range of precipitation during the same period was 10.22 inches to 30.13 inches (Oregon Climate Service). Successive years of drought are not uncommon. Rainfall changes quickly as elevation increases within the city. Precipitation data is collected at 1750 feet although elevations in the city range from 1720 to 3560 feet. The Mediterranean climate of Ashland is characterized by hot, dry summers with the majority of rain falling from October through May each year. Typical summer winds blow up the Bear Creek valley into Ashland and into the watershed from the northwest. Past wildfires in Ashland have spread according to this wind pattern.

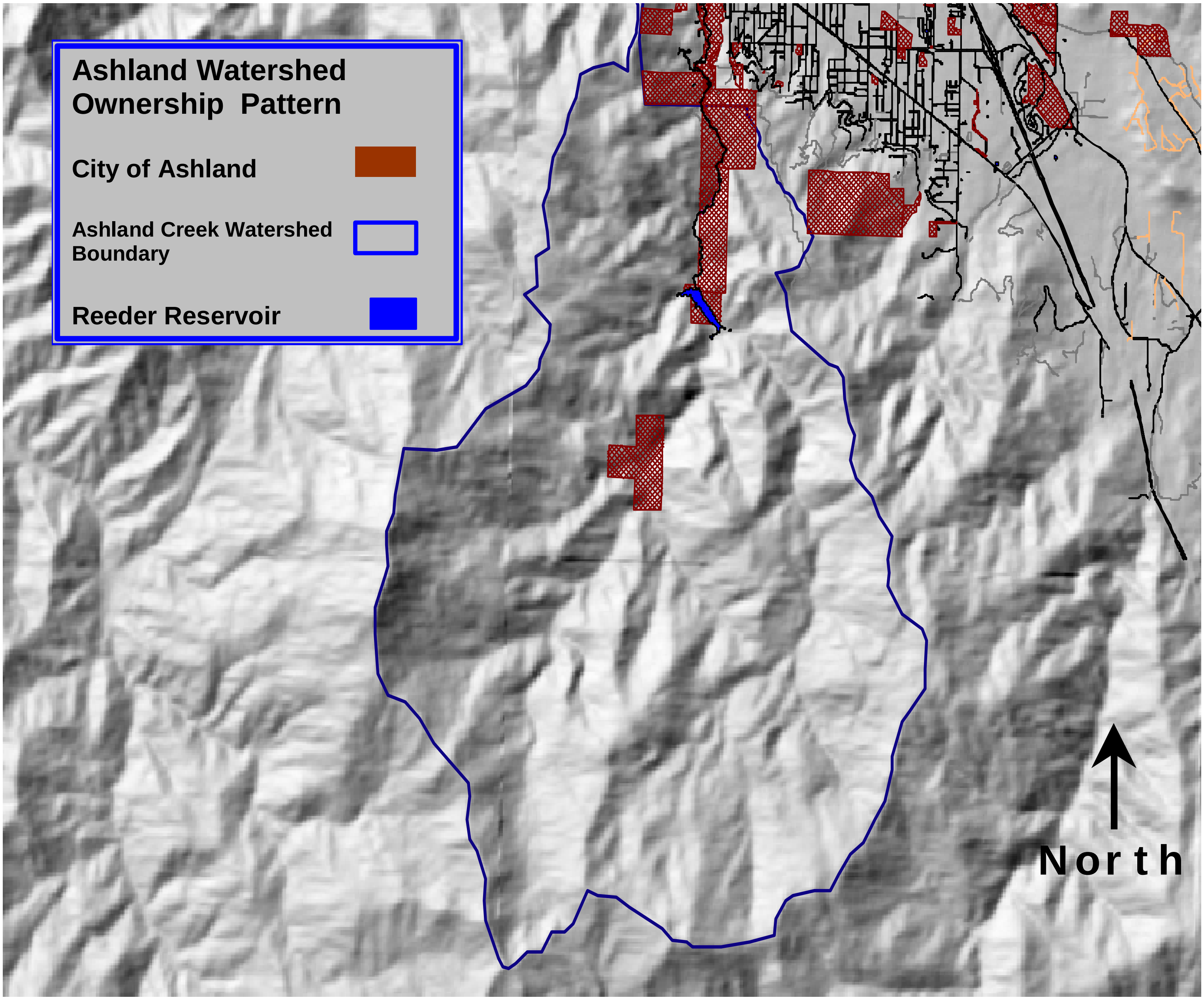
Vegetation of the Ashland area is diverse and highly dependent upon changes in soils, topography, and elevation. A detailed discussion of vegetation can be found in Appendix VI: *The Ashland Wildland/Urban Interface Wildfire Management Inventory, Analysis, and Opportunities.* The physical, biological, and climatic setting of Ashland is an important foundation for understanding and managing the wildfire hazard in Ashland and the watershed.

Land Ownership Pattern and Plan Boundaries

The 14,921-acre Ashland Creek watershed is composed primarily of land under the jurisdiction of the USDA Forest Service. The remaining drainage area is a combination of municipal and private ownership. The City of Ashland and Ashland Parks and Recreation own 780 acres in the watershed (Map 1).

While the entire watershed holds a high priority for fire protection at this time, the majority of homes in the interface lie outside the immediate Ashland Creek watershed drainage area. Private ownership accounts for the vast majority of land in the City wildfire zone. The Ashland Forest Resiliency Community Alternative (AFRCA) submitted by the community under the Healthy Forest Restoration Act covers Forest Service lands both inside and outside the Ashland Creek watershed.

Map 1. Ashland Watershed Ownership



What is the "Wildland Urban Interface"?

The Wildland Urban Interface (or "WUI" as it is often referred to) is defined as a geographical area where human habitation and their developments intermix with wildland or vegetative fire fuels. This human development may consist of both interface and intermix communities. Typically, these communities meet or exceed housing densities of one structure per five acres, with natural vegetation coverage of at least 50% of the land area. The typical boundaries of a WUI exist without reference to municipal city limits or urban growth boundaries.

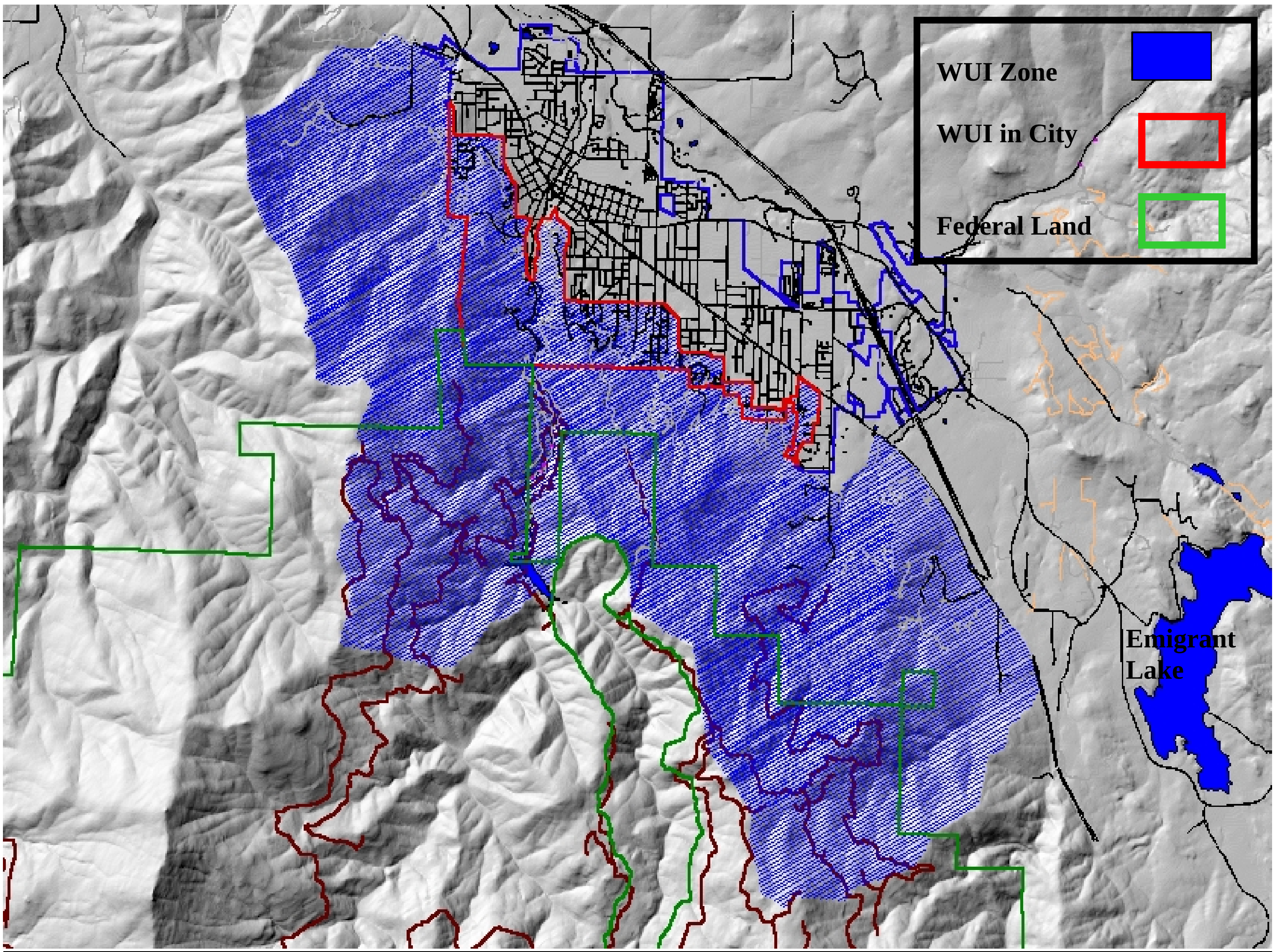
As human habitation extends into areas of natural vegetation, the propensity for large-scale wildfire increases with the corresponding loss of human life and property. Home construction within or adjacent to the WUI creates the potential for an increase in fire ignitions of wildland fuels, or conversely the loss of homes from wildfires burning into developed areas. Experience has proven that these catastrophic losses do not occur in those areas within the WUI where wildfire fuels are effectively managed by homeowners. Jack D. Cohen, a research physical scientist with the USDA Forest Service, has stated, *"….home ignitions are not likely unless flames and firebrand ignitions occur within 40 meters of the structure."* Clearly, the comprehensive thinning and on-going management of wildfire fuels in proximity to homes is a key tool used to prevent loss of homes and lives.

The management of the potential for wildfire within the WUI is of even greater importance when these areas are located in or adjacent to municipal watersheds and experience heavy recreational use. The key to the preservation of water quality and other forest resource values within the Ashland watershed is contingent upon our ability to manage the geographical distribution and intensity of wildfires occurring within the watershed. The majority of wildfires which have burned in the Ashland Watershed during the last century have occurred at lower elevations within the WUI and have burned into the watershed in response to upslope wind patterns, slope, aspect and vegetative patterns. Too often we see the public response to major wildland-urban interface wildfires as being fatalistic in nature, as if no human ability exists to modify these outcomes. We maintain that the manipulation of wildfire fuel vegetation and the careful monitoring of the type and distribution of human developments within the WUI can significantly reduce the threat of wildfire.

The continuity of topography and vegetative characteristics of the lower Ashland Watershed and adjacent watersheds define the administrative boundaries of the WUI as allowed under the HFRA. Consideration of these factors, as well as an analysis of possible wildfire behavior lead to the establishment of the WUI outlined here in the Ashland CWPP. Thus the WUI is defined as a geographical area that originates along the northern boundary of the existing Urban-Wildland Fire Zone within the City of Ashland (Ashland Street) and continues upslope to the upper southern boundaries (ridgetops) of the numerous smaller watersheds which drain through Ashland (See Map 2 next page).

Defining the WUI as allowed under the HFRA was difficult. There was widespread agreement regarding the ecological and community protection aspects of the WUI boundary, but a lack of clarity on the political ramifications of the WUI area. It was impossible for our working group to anticipate all the future implications of our decision on the location of the WUI, not only for this particular project, but also for our continued involvement in future restoration projects. Because the HFRA is a new process and subject to change and interpretation, the community may choose to redefine the WUI boundary should conflicts with community values or opportunities that require a different interpretation of the WUI arise. Recognition of the connectivity between the City, the WUI and the watershed is paramount. We stress the critical importance of the Ashland Creek Watershed as our municipal water supply and further stress our dedication to collaborative watershed management in perpetuity. Any WUI definition cannot compromise these values.

Map 2. Wildland-Urban Interface Zone



Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

Fire and Water- The Ashland Creek Watershed

As identified in the Ashland Forest Resiliency's (AFR) purpose and need statement (the original USFS project proposal under HFRA) the potential for large scale, high intensity wildfire in the Ashland Creek watershed threatens the viability of Ashland's water supply and late-successional to old-growth forest habitat (U.S. Forest Service, 2004).

A very long partnership exists between the Forest Service and the City of Ashland. This partnership stretches back to the 1929 Memorandum of Understanding (MOU) between these two entities (Appendix I). The MOU declares a partnership between the City and the Forest Service wherein management actions taken in the watershed can only enhance the delivery of quality drinking water to the City. Projects such as the Ashland Watershed Protection Project of 2000 and the City Forestlands Restoration Project: Phase II (2003) have laid a solid foundation of support for collaborative forest management in Ashland. With purpose and need defined for more extensive restoration in the lower watershed, we are now embarked on a long road toward a resilient forest ecosystem. The Ashland Forest Resiliency project and Ashland Forest Resiliency Community Alternative are the next step and once again the community is offering thoughtful input for management of its watershed (Chapter 8).

Chapter 2- History of Wildfires and Wildfire Mitigation in Ashland area

"The fiercest timber fire that has ever taken place close to Ashland has been raging along the hillsides of Ashland Creek Canyon for the past three days, and its work of destruction was only placed under control last evening."

- Ranger W. Kripke (August 26, 1901 as documented in the 1992 Ashland Forest Plan)

Since European settlement of the area records of wildfires cover many significant events in the Ashland area:

DATE	CAUSE	SIZE
Summer, 1901	Unknown	Unknown
August 10, 1910	Lightning	4,000 acres
August 1917	Lightning	1,000 acres
Summer 1924		Numerous large fires
August 5, 1959	Arson	4,700 acres
Summer 1967	Abandoned Campfire	Unknown
July 16, 1968	Debris Burning	
Summer 1969	Abandoned Campfire	Unknown
September 18, 1971	Abandoned Campfire	
September 5, 1973	Arson	350 acres
August 19, 1981	Arson	
August 19, 1987	Arson	13 acres
September 9, 1988	Arson	60 acres
July, 2003	Lightning	25 acres

The history of wildfire in the area is a strong argument for precautionary measures to protect lives, homes, and the watershed. Taking this cue, the City of Ashland has a history of mitigation measures taken to protect residents as well as to minimize the spread and impact of fire in the wildlands. An accounting of actions taken is located in *Silviculture Management History* (Appendix I). This document is a brief accounting of planning, education, and projects implemented in the Ashland area.

Community Collaboration and Planning History

It is worth noting that significant progress has been made in the community and on the land. Major planning efforts behind the Ashland Watershed Protection Project (AWPP) on federal land and City Forestlands Restoration Project: Phase II (municipal land) are a direct result of citizen input and collaboration amongst community members and federal land managers. Documents created in these processes stand as major achievements in public forest planning and management. Reaching further back notable achievements include the *Ashland Forest Plan* (1992), the *Hamilton Creek Watershed Coordinated Resource Management Plan* (1990), and various outreach efforts to homeowners.

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

The Ashland Watershed Stewardship Alliance (AWSA) played a key role in the AWPP Record of Decision (2000) signed by Ashland District Ranger Linda Duffy. AWSA came together in response to the proposed "HazRed" plan put forth by the Forest Service. The group consisted of diverse stakeholders throughout the community focused on sound watershed management. After 4 years of planning and negotiation, the 1,549-acre project was agreed to and is being implemented on the ground (Appendix II).

The City Forestlands Restoration Project: Phase II was also the result of long deliberations among volunteers on the Ashland Forest Lands Commission. The result was commercial thinning of 143 acres of municipal forestland to encourage healthy, resilient forest conditions (See project summary, Appendix III). The document guiding this work is a statement of community values as well as technical expertise. Hundreds of hours of volunteer time were spent creating this plan (Appendix IV).

Chapter 3 Community Wildfire Hazard Assessment

Ashland Wildland/Urban Interface Wildfire Management **Inventory, Analysis, and Opportunities**

The private and municipally owned forestlands leading from the valley up into the Ashland Creek watershed and adjacent watersheds constitute the heart of the WUI issue where homes and flammable vegetation present a significant risk to lives and watershed values. Major WUI wildfires in 1959 and 1973 started on private land and burned into the watershed before being suppressed. After the creation of the National Fire Plan in 2000 and the subsequent availability of grant funding for fuels reduction, Ashland developed a WUI management plan. The analysis and plan were created by Small Woodland Services, Inc., submitted to the City, and approved in 2001. This document provided a key substantive element to the City's case for receipt of National Fire Plan funding. The *Wildfire Inventory, Analysis, and Management* document is presented in its entirety as Appendix V. Elements of this document such as structural ignitability and fuels reduction are addressed in more detail in subsequent chapters of this plan.

Chapter 4 Wildfire Fuels Reduction Program and National Fire Plan Grants

Grant Summary

The vegetation hazard rating system in the *Wildfire Management Inventory, Analysis, and Opportunities* document was used to develop a work agenda for National Fire Plan funded fuels reduction. The first grants were administered by the City Fire Chief, but increasing availability of funds lead to a grant coordinator position in September of 2002 to handle outreach to homeowners in the interface zone. The coordinator position is funded by a Jackson County Title III grant and supplemented by the National Fire Plan.

Beginning in 2001, Ashland Fire and Rescue pursued National Fire Plan grant funding for wildland fuels management through the Oregon Department of Forestry. Grants in Federal Fiscal Year (FFY) 2001 of $8,000 and $30,000 were expended by December of 2002. Another FFY2001 grant for $242,000 is nearly expended as of April, 2004. During 2003 an award of $262,500 was signed through the National Fire Plan. The City of Ashland has passed through a total of $221,000 to administer the fuels reduction program within the City limits. Another grant in the amount of $250,000 will be available in the fall of 2004.

Table 4.1 summarizes the grants, years, and money available.

Table 4.1

Grant Fiscal Year	2001	2001	2001	2003	2004
Amount	$8,000	$30,000	$242,000	$262,500	$250,000
City Pass-Through	$8,000	$30,000	$150,000	$ 33,000	All
Spent in City Limits	$8,000	$30,000	$150,000	none	N/A
Outside City	N/A	N/A	$ 92,000	$229,500	N/A
Status/Amount Left	*Spent*	*Spent*	*$ 22,392*	*$102,394*	*All*

Costs include administration at the State and local level as well as cost share agreements with landowners for vegetation thinning and disposal associated with fuels management. Exactly 172.25 acres of thinning has taken place within Ashland's city limits since the program's inception in 2001. The acreage thinned is spread over 147 properties in the interface zone ranging from one-tenth acre defensible space to area-wide strategic suppression zones. Outside of Ashland's city limits, grant-funded treatments were coordinated by the Oregon Department of Forestry in 2002-2003 and then through Ashland Fire and Rescue in 2003-2004. Outside the City limits there is 575 acres of land thinned or currently in progress.

As of July 2004, the Ashland grant area (Ashland Mine Road to Tolman Creek Road) has received high priority for grant funding. A FFY2004 grant was signed with the USDA Forest Service for $250,000. Grant awards are good for five years. Funds should be available in September of 2004. Work will continue in high priority zones around homes, driveways, and tactical suppression opportunities.

For federal fiscal year 2005 Ashland applied on behalf of landowners in the Clayton Creek area, encompassing 2,500 acres to the south and east of Ashland. National Fire Plan grant applications were submitted for creation of a hazard map and analysis as well as fuels treatment funding. Currently, the planning and mapping project is not funded but the fuels reduction money has received favorable status. Final decisions are made when the federal budget is funded in winter or early spring.

Strategic Approach

At the outset of this work, the Ashland Fire Chief decided to prioritize the work on defensible space directly adjacent to homes and neighborhoods along with strategic suppression opportunities in the urban area. Phase II began work in management priority zones and extreme hazard areas further from homes. As of spring 2004 many management priorities have been accomplished, suppression zones extended, and fuels managed over hundreds of acres of municipal and private land. The vast majority of the highest priority work in extreme hazard zones and neighborhoods in the city has now been accomplished and work is taking place in strategic zones such as ridge tops and areas where fire suppression is likely.

Firefighter safety is another important point as is the ability to stop a fire in the WUI. Landscape level thinning projects (maintained over time) provide opportunities to stop an advancing fire in the WUI which would "test" the preparedness of an even greater number of homes. It is important to recognize that even effective outreach campaigns won't result in 100% response. In any one neighborhood, a number of homes will remain susceptible to ignition. Limiting home fire exposure is an important function of landscape suppression opportunities in the WUI.

Landowners are a key part of the fuels treatment process. On a property by property basis, landowners learn about fire ecology, vegetation, and wildfire home safety. Fuel treatments are not mandatory, so each property is approached as a win-win situation where owners are part of the decision making process. Landowners often cooperate to create a network of thinned areas connecting their properties.

Maintenance of fuels through time is a key concern. Negative consequences of past fuels management are already apparent. Invasive weeds such as Scotch broom, Canada and bull thistle, Himalayan blackberry, and mullen have invaded fuels management zones within 1 and 2 years post-treatment. There is a need for conifer re-establishment in areas where whiteleaf manzanita, deer brush, buck brush, insect-killed Douglas-fir, and shrub cover has been removed. Planting of pines in particular will create desirable long-term conditions where a healthy overstory suppresses understory shrub growth.

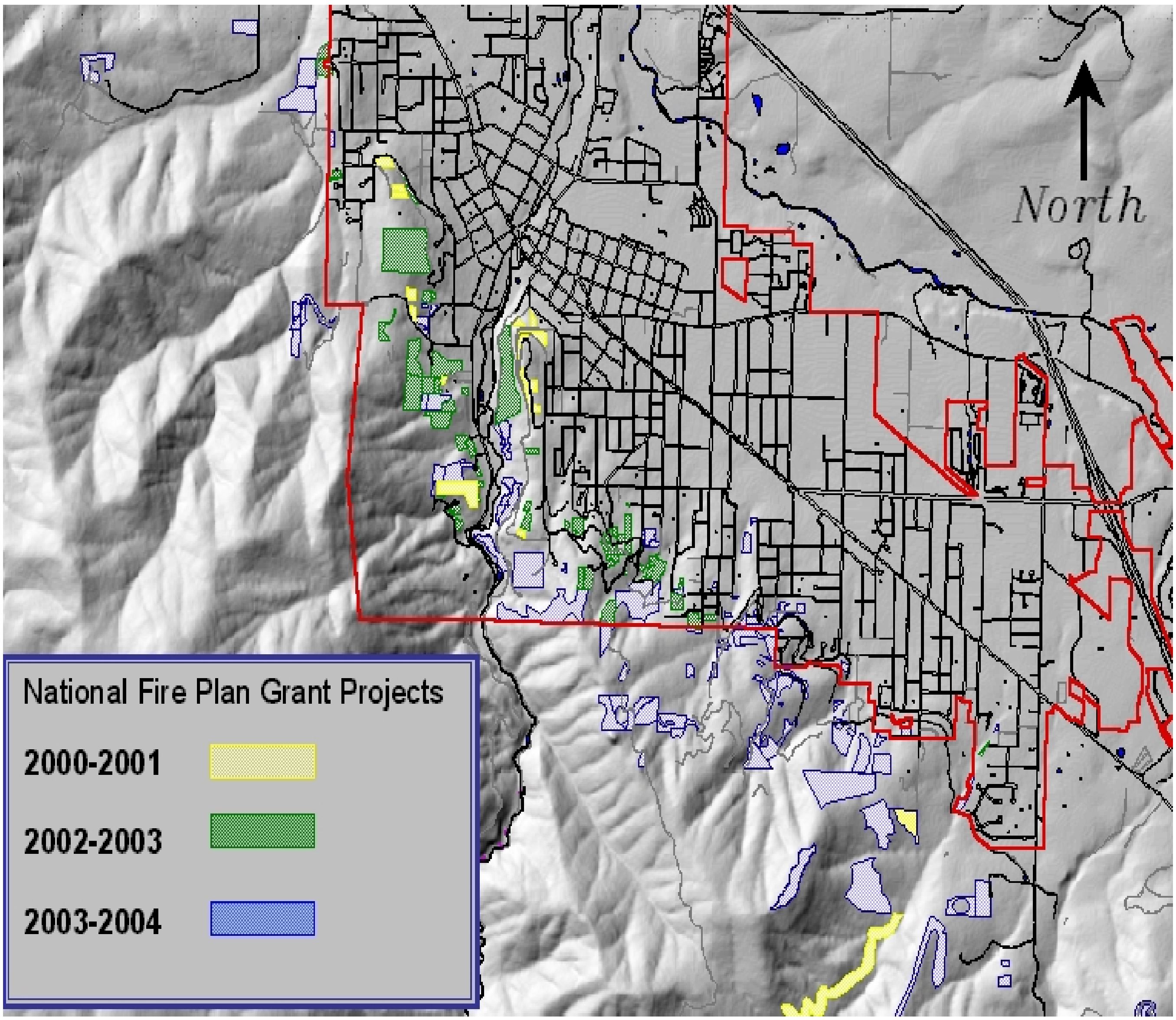
The need for maintenance labor and funding will be decreased over time if investments in planting are made now. Currently there is no money available for follow-up treatments. Future funding opportunities to pursue include Title II, State Insect and Disease Management funds, County Title III, and private funding.

Fuels management projects are photographed before and after work is completed. The areas treated are entered into the City's GIS database for tracking (see Map 2). Each fire season a map is produced showing managed fuels and opportunities for fire suppression in the WUI zone. Copies are distributed to the Oregon Department of Forestry, Jackson County Fire District #5, and the U.S. Forest Service. In order to be effective as a planning and response tool, this map should remain updated yearly. Inaccurately represented information could create a hazardous situation for firefighters and homeowners. Map 2 (next page) shows a chronological account of fuels management projects in the Ashland WUI.

Chapter 4 Action Items:

- Maintain thinned landscapes over time.
- Pursue funding for invasive plant management and native grass seeding
- Maintain Staff position to manage fuels
- Maintain yearly map of strategic suppression opportunities

Map 2. Grant projects by year.



Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

Chapter 5 Wildfire Hazard and Risk Regulation: Codes and Acts

Each and every homeowner in the Ashland WUI assumes a high degree of risk as well as responsibility. While the efforts and bravery of local firefighters may save some homes in a large-scale fire it is unreasonable to rely solely on fire suppression to guarantee home safety. U.S. Forest Service fire researcher Jack Cohen succinctly states:

"Instead of all pre-suppression and fire protection responsibilities residing with fire agencies, homeowners should take the principal responsibility for assuring adequately low home ignitability. The fire services become a community partner providing homeowners with the technical assistance needed for reducing home ignitability."

The potential for loss of life and destruction of property is very real in the Ashland WUI. Loss of private property and damage to public forestland and parkland are the likely outcomes of a serious WUI fire event. These common areas also hold significant value for recreation, wildlife habitat, and spiritual renewal. Responsibility for maintaining a fire-safe landscape on private land affects not only that property owner but adjacent homes, property, and the common values on public land as well. The policy of the City is to reduce the potential for fire to spread from property to property, causing significant risk to lives and resources. This goal will be pursued through a combination of education, municipal code, fire codes, and financial incentive (when possible). Education is seen as the primary means with which to create fire awareness and a reduction of fire danger. When education fails, regulations will be in place to ensure compliance. Existing wildfire related codes are summarized below and included in the appendix. New code adoptions are listed in the Action Items at the end of the chapter and again in Chapter 10.

Ashland WUI Wildfire Codes

Ashland municipal codes address new construction in wildfire lands as well as weed abatement. At the county level there are similar requirements for structures in fire-prone areas and the State of Oregon has passed requirements for interface homeowners as part of Senate Bill 360. County residents should consult with Jackson County Planning for current rules and regulations for developing in wildfire lands. Ashland Municipal Codes dealing with wildfire are included in their entirety as Appendix V.

As of August 2004, city staff is developing a new code that will regulate residential landscaping. Recent home fires in Ashland were spread by highly flammable domestic vegetation. In simply choosing less flammable landscaping, residents can greatly reduce fire hazard around their home. The new code will regulate landscaping plans for new construction throughout the City to prevent hazardous situations. Plans to regulate existing structures can be included when the Oregon Fire Code is adopted in the fall of 2004.

The State of Oregon will adopt the 2004 International Fire on October 1, 2004. For the first time, part of the adopted Oregon Fire Code will be the International Urban-Wildland Interface Code. This code has the weight of municipal code and is fully enforceable by local fire officials after adoption at the local level. The City of Ashland is scheduled to adopt the Oregon Fire Code with local amendments in the fall of 2004. A copy of the Oregon Fire Code can be found at Ashland Fire and Rescue Station #1.

Jackson County

Many residents live just outside the City limits under the jurisdiction of Jackson County. A full lineup of county codes will not be part of this document. County residents are encouraged to contact the Jackson County Planning Department at (541) 774-6900 for specific regulations related to wildfire. Jackson County Planning now employs a full-time fire safety inspector for enforcement of wildfire mitigation codes.

State Regulations -Senate Bill 360

Senate Bill 360 or the Oregon Forestland-Urban Interface Fire Protection Act of 1997 will be in effect in the fall of 2004. Hundreds of residents in the Ashland WUI will be affected by SB 360. For details regarding landowner specifications go to the Oregon Department of Forestry's website at www.odf.state.or.us or call ODF in Central Point at (541) 664-3328.

Public Use Restrictions

The Oregon Department of Forestry (ODF) regulates public and industrial activities in fire-prone areas of Jackson County. The City of Ashland adopts these restrictions inside the city limits as restrictions change throughout the fire season. Please call ODF, Ashland Fire and Rescue, or the Ashland Fire and Rescue's webpage at http://www.ashland.or.us/Page.asp?NavID=284 for specific restrictions.

Fire season restrictions are imposed at various levels as a result of high temperatures, low humidity, dryness of vegetation, and availability of wildland firefighting resources. The phase-in is accomplished through prohibitions based on time of day and nature of activity. For example, the mowing of dry grass may only be permitted until 1 p.m. under a given level of restriction and later only permitted until 10 a.m. Examples of activities that are regulated through fire season restrictions are:

- Permitted hours of operation for public chain saw use.
- Permitted hours of operation for non-agricultural mowing of dry grass
- Permitted hours of operation for non-agricultural, non-commercial use of power driven machinery in areas of flammable vegetation
- Use of explosives
- Welding or cutting of metal
- Any spark emitting operation
- Use of campfire rings in Lithia Park
- Use of vehicles off certain designated roads
- Smoking outside of vehicles in wildland areas
- The use of fireworks or other spark producing devices, containing combustible materials, is prohibited in high fire risk areas.
- All Outdoor Debris Burning is Prohibited

Fire Danger levels may be established at "Moderate," "High," or "Extreme" levels and are implemented starting when fire season is declared by ODF.

Chapter Action Items

- Adopt Oregon Fire Code in Fall 2004. Include local amendments to regulate flammable vegetation.
- Write and adopt Firesafe Landscaping Ordinance to regulate plantings around new structures.

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

Infrastructure (utilities, roads) and the ability to respond to a wildfire can help or hinder fire suppression efforts in the WUI. Incident reports from WUI fires such as the California, Oakland Hills fire of 1992 reveal a critical loss of water pressure during the fire. The following account was taken from a review of the Oakland Hills fire by Oakland Fire Captain Donald Parker:

> *Fire units lost water, forcing them to retreat because the supply tanks and reservoirs were emptied. Loss of water occurred primarily because of:*
> 1. *Fire suppression efforts*
> 2. *Citizens wetting roofs and vegetation*
> 3. *Water service flowing freely in destroyed homes*
> 4. *Tanks and reservoirs could not be refilled because of fire-caused electrical failure*
> 5. *Many mutual aid fire engine companies could not connect to Oakland fire hydrants because they utilize two-and-one-half- inch hose couplings and Oakland fire units use three inch couplings.*

The City of Ashland owns and operates the community electric and water utilities. Utility access may be different for some homeowners in wildfire hazard areas outside the City limits. Municipal utility ownership is a mixed blessing: local control means higher accountability at the local level but it also means all funding comes from local taxpayers. All city residents, the majority of whom do not live in a wildfire hazard zone, must pay for proposed changes to infrastructure. Nonetheless, the potential for utility infrastructure failure at critical wildfire times of need remains a real possibility.

Electric Utilities

A reliable source of electricity is extremely important during a wildfire emergency for several reasons:

- Electricity runs booster pumps which supply water to homes, reservoirs and fire hydrants in Ashland's WUI.
- Rural homes often have wells that rely on municipal electricity.

Electrical problems during wildfires:

Improperly pruned or unpruned trees can contact power lines and cause a fire. (Please note the "live wires" are most often those located highest on power poles. Cable TV and phone lines are not a fire hazard and are often located near tree branches. If there is any doubt, please call the Electric Utility at 488-5357.)

- As the primary conductor heats up it will sag lower to some degree depending on its size, length of the span between poles, the type of conductor it is (aluminum, copper, ACSR, etc).
- Falling power lines can start new fires and present hazards to residents and firefighters in an emergency.

- During a wildfire, or any fire for that matter, there is the possibility of outages due to the smoke if it is intense enough. Particles in the smoke can create a cross-phase situation between two or more conductors running parallel either vertically or horizontally. When this happens a fuse cutout will blow somewhere on the line or the line can fall to the ground and remain live.

- The power poles can perform like "kindling" due to their high creosote content. The lines would be in danger if the poles were to catch fire not only from the smoke and heat but also from the potential failure of a pole.

- As with wind, the heat (if intense enough) can cause the conductors to sway or move.

Tree Trimming Near Electrical Lines

Officially, no one may trim a tree if it is within 10' of any conductor of primary voltage unless he/she is certified to work near or around, electrical conductors. This is not limited to the trunk of the tree itself. If any branch has the capability of coming in contact with the conductor then the person(s) doing the work must be line clearance certified. Call the Electric Department at 488-5357 for help regarding trees and electrical lines.

Water Utilities

The Ashland water supply system may be subject to some of the same failures that Oakland experienced in the 1992 fire. An analysis of the Ashland water supply system and potential hazards are described in Appendix VII: *City Of Ashland Fire Flows For Wildfires During Peak System Demand Periods.* This document summarizes the water supply capacity coming from the water treatment plant and through the distribution system. The supply capacity is then framed by the potential for a wildfire during peak water demand during the summer and under drought conditions. Even when water supply is not limited there could be delivery shortcomings due to limited water pressure, compounded by increased demand when residents turn on sprinklers to wet down rooftops and vegetation.

Firefighting Resources

The quick availability and access of fire suppression resources is extremely important during a wildfire. Many municipal fire services such as Ashland Fire and Rescue are trained in both structural protection and wildland fire suppression. The primary need for structural protection could easily outstrip the capabilities of our local firefighting resources to operate as wildland firefighters.

Residents in the Ashland WUI pay an assessment to the Oregon Department of Forestry for wildland fire response so that ODF crews can battle the wildland fire itself while the structural services protect homes. Mutual aid agreements between local agencies provide rapid response in the Ashland area despite the existence of administrative boundaries. Firefighting resources are described in Appendix VIII: *Ashland Fire & Rescue Wildland Fire Resource Commitments*.

Evacuation Plan

The City of Ashland has an official evacuation plan for residents in the WUI. It was developed through a grant from Jackson County combined with City of Ashland funds. The plan addresses preparation and action items for residents during a wildfire.

Ashland Fire and Rescue maintains an AM broadcast station that will be used for emergencies. Located at 1700 on the AM dial, the message covers all of Ashland and can be updated remotely.

The role of City departments and responsibilities are covered in the evacuation plan. The evacuation plan and maps will be delivered to homeowners in the WUI and posted on the City's website before fire season in 2005. Appendix XII: *Wildfire Evacuation Plan.*

Wildfire Prevention

Wildfire prevention is ongoing at the federal, state, and local level. Most notable is an agreement between the City and Forest Service to fund the watershed patrol. A patrol officer drives a designated route through the watershed during fire season to monitor activities. This program has existed since 1986 when volunteers biked and drove on watershed roads for fire prevention purposes.

Public vehicle access to the watershed has been closed for a number of years. During times of severe fire danger all vehicle access to forested areas is restricted. Signs along trails entering the watershed area remind residents they are entering wildfire areas and urge caution.

Post Fire Recovery

While it is difficult to outline the specifics of a response to a wildfire in the WUI and/or watershed, it is possible and important to outline guidance that reflects our values and understanding of the watershed. The community conversation and resulting recommendations on a post-fire response will be an important future piece to complete for our CWPP and is included in Chapter 10 as an Action Item.

Chapter Action Items:

- Develop and enforce landscaping ordinance for new and existing structures.
- Evaluate water flow capabilities in WUI neighborhoods under simulated worst-case conditions. Identify those with potential problems and suggest mitigation measures to Public Works and property owners.
- Identify electricity infrastructure at risk. Identify mitigation measures and present cost analysis to Council/residents.
- Educate public about evacuation plan and AM radio station.
- Conduct drills in different neighborhoods each year.
- Develop Post-Fire Recovery Plan for Public Land and Watershed

Chapter 7 Wildfire Preparedness for Homeowners

Other than loss of life, loss of a home is the most emotionally devastating result of a wildfire. Despite the tragic loss of hundreds of homes in the Oakland Hills Fire of 1991 and the Los Angeles County fires in 2003, it is widely recognized by fire experts that home loss is preventable. Often it is the small things that make or break a home fire loss during a wildfire event.

No fire department can be expected to prevent all home losses in an urban interface setting. The potential for a wildfire to outpace suppression efforts simply means that all homeowners in these areas accept an inherent level of risk. With this in mind, all residents in Ashland's WUI are urged to take the proper precautions during fire season each year. *Prepare your home as if the fire department won't be there to protect it.* This level of preparation means evaluating your landscaping, native vegetation, and house construction to determine your home's ignitability. See Appendix VI: *Protection from Wildfire: A Guide for the Management of Wildfire Risk for Properties Within the Urban-Wildland Fire Zone of Ashland.* Please call Ashland Fire and Rescue for an evaluation of your home or advice on creating a firesafe property 482-2770.

Links to Home Protection Resources on the Internet

www.firewise.org -Great all around resource for wildfire news and safety.
http://extension.oregonstate.edu/deschutes/FireResPlants.pdf -Firesafe plants
http://www.ibhs.org/publications/downloads/130.pdf- Step by step guide
http://www.fema.gov/pdf/hazards/wfie.pdf - Planning for all aspects of fire safety

Chapter 8 Ashland Forest Resiliency Community Alternative (AFRCA)

This proposal was developed over the summer of 2004 by an informal group of experienced natural resource professionals from the community of Ashland (Technical Team[1]), thus building on many years of community involvement in public land management in the watershed.

The development of the alternative was necessarily slow to initiate with several months devoted to defining our process and obtaining existing data from the Forest Service. Our work was heavily influenced by conceptual ecological models applied by the Technical Team based on extensive experience and varying degrees of field time in the project area and related systems. Our work attempted to integrate a host of watershed information into spatially explicit treatment units with prescriptions for treatment in specified priority areas rendered by Plant Association Group. Information used included: spatial data on vegetation, wildlife, and riparian areas; digital elevation models and assessment of landscape position to translate our conceptual models; ecological and community social values; and informed judgment on environmental sensitivities.

Management discussions and decisions are often subject to deficiencies in data. Our analysis was based on data that contained gaps, some known errors (e.g. PAG map) and uncertain accuracy (e.g., GRS vegetation) that we did not confirm nor correct with our own ground truthing. We also did not complete an assessment of our assumptions on the resiliency status of prior treated areas. These deficiencies will need to be addressed during project implementation planning. Nevertheless, we feel that the product of our collaborative effort represents an ecologically and socially sound framework to guide management in our watershed.

Our collective desire is to see this project implemented in an adaptive management mode. It will be essential to foster and maintain relationships with the community as an integral part of our proposal. We recommend that we be involved as working partners during conduct of the NEPA analysis and development of the implementation plan. In addition, our participation during implementation, both to advise on monitoring and in some cases to conduct research or participate in its design, is necessary for this iterative approach to be successful (e.g. fire history and stand reconstructions, long term analysis and modeling of treatment effects, and measuring movement to accomplishing our objectives).

Introduction

[1] Marty Main, Consulting Forester, City of Ashland (Team leader); Darren Borgias, Southwestern Oregon Stewardship Ecologist, The Nature Conservancy; Richard Brock, Consulting Botanist; Chris Chambers, Forest Work Grant Coordinator, City of Ashland; Evan Frost, Consulting Ecologist; Jay Lininger, Conservation Fellow, University of Montana; Tony Kerwin, Wildlife Biologist; Frank Betlejewski, Natural Resource Specialist; George Badura, Soil Scientist, USFS (retired); Cindy Deacon Williams, Conservation Director, Headwaters (fish biologist); Diane E, White, Ecologist; Keith Woodley, Fire Chief, City of Ashland.

This chapter presents the community alternative (AFRCA) for treatment of National Forest System forest lands within the Upper Bear Analysis area to retain or improve ecosystem resiliency (to fire). It is submitted to the Forest Service (USFS) as an alternative to be analyzed in the Ashland Forest Resiliency Project (AFRP) Environmental Impact Statement (EIS). As a statement of the community's values and sensitivities, this proposal ideally would be considered with continuing community involvement to guide a true collaboration with the USFS to develop a management alternative that reflects the best that the agency scientists, analysts, and managers, in combination with the community Technical Team, have to offer.

Regardless of whether this Community Alternative is selected outright, or it is used as part of a new proposal that represents an amalgamation with the agency proposal, it is essential that City of Ashland and community representatives continue working in a substantive role (i.e. not simply advisory) in the analysis process. It has been clearly indicated under the Healthy Forest Restoration Act (HFRA) that much of the important decision making will occur during the implementation phase in contrast to earlier planning phases. For this reason, it is imperative that city and community representatives, such as the AFRCA Technical Team, continue working with the USFS in an ongoing and substantive collaborative partnership.

The stated AFRP Purpose is "to protect values at risk, reduce crown fire potential and obtain conditions that are more resilient to wildland fires". The stated Need is "for urgent reduction of large-scale, high intensity wildland fire in the Upper Bear Analysis Area".

The Community Alternative has taken the purpose and need to mean management implemented at an appropriate scale in the next 10 years to reduce the potential for, and scale of, stand replacement fire events while maintaining other resource values. These include water supply and quality and late successional species habitat in forests that are influenced by fire over the long term.

AFRCA meets the Purpose and Need by making reasoned, prudent and professionally credible alterations to and manipulations of existing vegetation and fuels in order to promote restoration of long-term ecosystem function while simultaneously reducing short term, immediate threats to important community values at risk. The AFRCA uses the following strategies, where ecologically appropriate, to meet these goals:

1. Reducing primarily small-diameter fuels;
2. Reducing the density of understory seedlings, saplings and poles to reduce ladder fuels;
3. Thinning from below to create more open stand conditions;
4. Proposing prescriptions based on plant association groups (Forest Service AFR EIS 2004), plant associations (Atzet, et al. 1996) and site-specific conditions, such as aspect, slope, or soils;
5. Using prescribed fire where appropriate to reduce existing fuels.

The goals of AFRCA extend beyond fire resiliency. It strives to achieve multiple goals by creating a more fire resilient landscape. The Community Alternative seeks to:

1. Restore ecosystem integrity and resilience to terrestrial and aquatic ecosystems by promoting functional ecosystem processes that contribute to forest stand densities, structures, and species compositions that are sustainable over the long term. This

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

approach recognizes that a range of seral conditions is appropriate at any one time in the project area and that the potential for development and long-term expression of late seral conditions varies across the landscape.

a. Design management strategies for the project area that support ecological processes that foster the structural, compositional, and functional diversity at all spatial scales inherent in this portion of the eastern Siskiyou Mountains.

b. Retain late seral condition forests where the site potential is high for sustaining them long term. In early and mid seral stands, actively manage where necessary to restore ecological processes that would lead to the development of late seral conditions in a shifting pattern across the landscape consistent with an active natural fire regime.

c. Manage to maintain and restore habitat connectivity for late successional species in those plant communities that best support this kind of habitat.

d. Restore stands of open canopied pine and Douglas-fir with abundant veteran (reserve) trees where the site potential is high for sustaining such systems long term.

2. Manage the entire municipal watershed including protection and restoration of aquatic and riparian conditions, to support and allow for continued production of high quality drinking water for the City of Ashland.

3. Reduce the potential for large-scale high severity disturbance events, particularly fire events.

This project is intended to meet the restoration goals and objectives listed above. Stand treatments and other vegetation manipulations will be implemented only where needed to facilitate restoration of ecosystem processes or to reduce immediate threats to homes and human infrastructure. Although this ecoregion is typified by fire-driven disturbance, past management actions have interfered with important ecological processes in the watershed leading to homogenization and a less dynamic system.

Restoring biological, physical and chemical processes and functions to ensure the long-term ecological sustainability of the public lands in the watershed is more important to this community than the output of forest products. As a result, **any commodity production derived from the implementation of this proposal should occur only as a by-product of management and only when such activities do not impair efforts to restore the ecological integrity of the watershed.**

While this project primarily focuses on initiation of planned disturbances and structural manipulations of existing vegetation, we emphasize that the long-term goal is to use these efforts to facilitate the return of a more dynamic range of functional processes, particularly fire. Where possible and appropriate, prescribed fire should be introduced immediately to help return fire as a functional process in the watershed. In the long-term, however, it is anticipated and hoped, that the actions suggested herein will facilitate a return to conditions where natural disturbance processes, including fire, can play a more natural role as a basic functional process within the ecosystem.

AFRCA, April 30, 2004

The original Community Alternative, dated April, 2004[2], called for the following actions and offered constraints on management:

1. Complete a spatially explicit inventory of vegetation and soil conditions in the Ashland Watershed.
2. Focus inventory and treatment on the dry plant association groups (Ponderosa pine, dry Douglas-fir, moist Douglas-fir, and dry white fir).
3. Establish a Fuel Discontinuity Network (FDN).
    a. Identify and use features that currently have a lower crown fire potential. Areas fitting this classification where referred to as "Category 1".
    b. Identify and implement fuel reduction treatments in areas where relatively little resource investment may be able to create relatively fire resilient stand conditions. Such lands are referred to as "Category 2".
    c. Identify and implement treatments in those areas that occupy a strategic geographic position in the landscape relative to a and b. These areas are referred to as "Category 3".
4. Where landscape-scale fuel reduction is determined to be most strategic (Number 3 above), plan treatments that recognize and foster natural variability, pose the least risk to resource values and facilitate the restoration of fire as a key ecosystem process.
5. Incorporate research and monitoring as essential components of this alternative.

Component 1. Additional observations have been made, but have not satisfied the need for a reliable inventory across the watershed. We continue to feel Component 1 is extremely important and foresee it occurring at the implementation stage of the project.

Components 2 through 5 have been addressed in more detail and make up the remainder of this chapter.

AFRCA, October 1, 2004

Fuel Discontinuity Network
The Community Alternative proposes to establish a Fuel Discontinuity Network in the Ashland Watershed by integrating portions of the landscape that currently confer fire resilient properties with areas on which treatment will be implemented to restore such benefits. In general, the AFRCA envisions the Forest Service will reduce fire risk in the Ashland Watershed by completing implementation of the Ashland Watershed Protection Project and treating additional specified priority areas to reduce wildfire hazard (e.g., Priority 1, 2, 3, 4, 6, 7, and 9) and restore habitat (e.g., Priority 11 and 12).

[2] Appendix 8.1.

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

Category 1. Features that are currently fire resilient (Map 8.1).

An examination was made of the mapped vegetation and physical features of the watershed that, according to our conceptual ecological models, might currently exhibit conditions that support low crown fire potential. These areas included natural openings, meadows, relatively open ridgetops, moist riparian areas typically indicated by perennial streams, fire resilient stands characterized by large trees and little or no understory vegetation and areas where management has temporarily reduced crown fire potential. These areas make up about 8929 acres of the total 22,286 acres in the project area, the bulk of which are represented within the Riparian Reserves (Table 8.1). Most of the natural openings are at high elevation within the Shasta Red Fir and Mountain Hemlock Plant Association Groups. While important for the high elevation sites, they contribute little to the desired fuel discontinuity network that would reduce the potential for widespread stand replacement fire at mid and low elevations. While Riparian Reserves and the riparian habitat they encompass are relatively widespread, some of the forests have dense understories of seedlings, saplings and poles that are more prone to severe fire effects and therefore less fire-resilient.

This planning effort assumed that the USFS would complete the projects scheduled in the Ashland Watershed Protection Project (AWPP), reportedly about 50% completed at the time of this writing. Based on examination of the landscape and on our judgment we assumed that many of the areas that previously had been treated to reduce fuels, such as the units of the AWPP, the prescribed broadcast underburns in and around the East Fork of Ashland Creek and shaded fuel breaks, would require ongoing periodic maintenance at a minimum. These previously treated lands were re-allocated to Category 2 as the Priority 3 areas.

Category 2. Features that “readily” are made fire resilient (Map 8.2).

Physical settings and vegetation data were analyzed to identify sites in addition to the previously treated lands discussed above where forest composition and structure should be managed or maintained to restore conditions that increase the potential for fire resiliency by sustaining relatively low fire intensity and severity in the future. Based on our conceptual ecological models and judgment, we included in the category areas dominated by pine species and settings predominantly in upper and middle slope positions, primarily on southerly and westerly slopes prone to desiccation due to solar and wind exposure, shallower soils, and overall lower soil moisture retention. These are conditions that typically support ponderosa pine and Douglas-fir at relatively low density along with hardwoods, particularly oak species. Strategies for interacting on northerly and easterly aspects of upper one-third slopes were also considered but have yet to be finalized in this approach. Selected areas mapped in the AFRCA plan excluded patches where fire resilient, late seral and old growth conditions were likely to occur based on modeling with the vegetation data available. Ground truthing during implementation likely will identify some areas currently included that should not have been as well as locate some areas currently excluded that should have been included. Sensitive areas prone to landslide hazard, with slopes greater that 65 percent, areas with shallow or sensitive soils and sites within ¼ mile of a spotted owl activity were excluded. There are 8235 acres in this category, including 3367 previously treated acres. The technical committee ultimately decided not to treat 863 acres (Priority 10) at higher elevation in this proposal.

Priority 2- Pine Dominated Stands. Several types of forest-settings were classified for treatment within this category to meet goal 1d — enhancing the survivorship of large fire-tolerant white and black oak, ponderosa pine and sugar pine dominated forest stands. These veteran oaks and pines confer a high degree of stand resilience to fire provided the understory of seedlings, saplings and poles are not excessively abundant (conditions that create horizontal and vertical homogeneity in the fuel bed that is conducive to canopy fire) and are a threatened structural element. We mapped stands where pine is the predominant species and that occur on the upper two thirds slope positions on any aspect and placed a high priority on these settings for understory thinning below and around these veteran trees. The veteran trees in these sites are considered susceptible to reduced growth and vigor resulting from drought and density related moisture stress. Reduced vigor promotes insect and disease related mortality; hence the high priority for treatment in these stands.

Priority 3. Areas that received fuel reduction treatment in the past originally were grouped within Category 1, but after further consideration at least some will be determined Category 2 because of their current or near-term future need for maintenance to retain conditions that support low crown fire potential and satisfy other stated goals. Treatment may include follow-up understory slashing, prescribed burning or silvicultural thinning. It is an oversight of this plan that it did not evaluate the spatial patterns and acreage of priority treatment setting types and prescriptions particularly within the areas previously treated with prescribed burning by the USFS. A second iteration of the GIS modeling to account for the acreage of these priority treatment settings within these units is among the updates and corrections needed to evaluate the full effect of AFRCA.

Priority 4. Lower elevation southerly and westerly slopes on the upper two-thirds of hillsides and ridges, typically support open mixed stands of oaks, large Douglas-fir, ponderosa pine, and sugar pine often with a high abundance of seedlings, saplings, poles and younger, mature Douglas-fir and white fir. Such low elevation mixed conifer stands are a high priority for understory thinning below and around these reserve trees to restore their fire resiliency by improving the survivorship of the veteran trees in a subsequent fire. Currently, moisture competition with the dense understory that has grown up since fire suppression raises the urgency to treat these stands. Fuels would be reduced and the density of the smaller trees would be thinned to re-establish more open conditions that would have occurred had fire suppression not affected stand structure. Historically these settings were prone to relatively frequent (yet variable) wildfire of low and mixed fire intensity and severity that killed predominantly young trees, thinning from below, while larger trees more frequently survived. The intended manual treatments are designed to reestablish horizontal discontinuity in dead and live fuels, removing the abundance of young recruits that have established and grown in the long fire-free interval,

Priority 5. The Technical team will develop a plan to address this priority by October 15th, 2004. Compared with south and west aspects, moisture stress is less on the northerly and easterly aspects of the upper thirds of the slopes at lower elevations—settings that include Douglas-fir PAGs and the Dry White Fir PAG. Because of hill slope shading, temperatures are cooler and available moisture is typically greater (not included here are stands of the Moist White Fir PAG, which may occur in the same general slope and aspect, but within draws or on benches where greater available moisture is retained). These settings have a higher site potential to support a healthy growth of trees at greater density than slopes facing the afternoon sun, however, not having developed with recurrent fire during their development, many such stands are found with excessive stand densities especially of abundant understory and 2nd cohort trees (defined below) in the canopy, including some larger diameter Cohort 2 trees. These conditions increase the potential for severe fire effects and threaten the large veteran Douglas-fir and pine Cohort 1 trees where they occur. These same trees often are threatened by loss of vigor due to density related issues that increase the potential for more severe effects of insects, fungi, and parasitic plant populations. This setting and its associated issues are necessarily complex and the Technical Team has not resolved the extent or conditions under which we believe stands in these settings should be treated or resolved the prescriptions to be applied. We intend to continue discussions to reach consensus regarding appropriate management of lands within this setting. In any case, the Technical Team is unanimous in recognizing a need for further assessment and research in these areas.

Priority 6. The upper one-third of southerly and westerly aspects at middle elevation predominantly supports the Cool White Fir Plant Association Group. Abundant veteran trees of Shasta red fir, Douglas-fir and pine species occur in such settings and these historically conferred fire resilience to such stands, provided the interval between fires was not too extensive. Good examples can be seen along the road from Four Corners to Bull Gap. Understory and canopy encroachment by younger white fir and the accumulation of down and dead fuels in the absence of fire increase the potential for stand replacement fire in these stands.

Other stands in these areas are dominated by white fir that developed as dense stands in the absence of thinning by low intensity fire. While these stands are naturally thinning their ranks to varied degrees through competition for site resources (and potentially through insect and fungal related mortality) a greater probability of fire events burning with intense fire behavior and severe effects is expected. Reducing the density of such stands is proposed as a means to reduce potential fire severity and increase the potential for developing late seral old growth conditions and protect watershed values, particularly water supply. The GIS setting selection process also allowed inclusion of the Moist White Fir PAG which may occur in such slope positions and aspects, but within draws or on benches where greater available moisture is retained.

Priority 10. **There was agreement among Technical Team not to treat in this proposal.** At higher elevations, north and east facing slopes support both the Cool White Fir and the Moist White Fir Plant Association Groups. Such stands are highly productive, cooler, more moist and are less prone to burn. They carry fire less frequently and can support late successional old growth development with either little understory or stands with more open canopies and understories with abundant understory trees. For this reason such forest settings are a lower priority for treatment, however, stand densities and the potential for severe widespread canopy fire among stands and the spread of forest pathogens can be a problem that may be addressed by thinning from below.

Category 3. Strategic connections (geographic, ecological, logistical, and social) (Map 8.3).

This category accounts for many types of settings that may include selection of all plant association groups up the Cool White Fir PAG [Dry Douglas-fir (which contains inclusions of Oregon White Oak, Ponderosa Pine PAGS), Moist Douglas-fir, Dry White Fir and Moist White Fir PAGs]. The areas were evaluated for fire hazard based on several factors including ecological value at risk and the social values and hazards associated with the Wildland Urban Interface (WUI) (Table 8.1). It was felt that treatment was needed on these areas.

Priority 1. The highest priority strategic area within the project area is considered the Wildland Urban Interface because of the hazard of fire in the proximity of homes and other development and escape routes. Much of the WUI on federal land has already been treated or identified for treatment in AWPP and the acreage of treatment settings shown in the table does not include those areas. Although not included in the table, the Technical Team considers completion of the AWPP a top priority. The GIS analysis allowed inclusion of Landslide Hazard Zone 2 and slopes up to 75% in the interface (with proper mitigation measures and rationale) to allow for optimal abatement of fire hazard for the urban values.

Priority 3. Managing fire risk in plantations established in earlier timber harvest units is important to the project.

Priority 7— Corridors within 50' of Riparian Area (using Riparian Reserves as a surrogate for mapping) or ¼ mi of NSO activity center that also are within 200' of any treatments above, were a mid-ranked priority. These areas take advantage of resiliency, existing or created, and extend treatments where possible to link with above described riparian and NSO activity centers.

Priority 9— Roadside corridors within 100 feet on either side of roads spanning short distances between other selected units. Identification of setting for these buffers was further restricted to the lower elevation Plant Association Groups. These were designed to offer fuel reduction zones that would be useful in promoting use of prescribed fire and to facilitate wildfire management. Areas identified for inclusion in this priority also extend fire resilient linkages between treated areas.

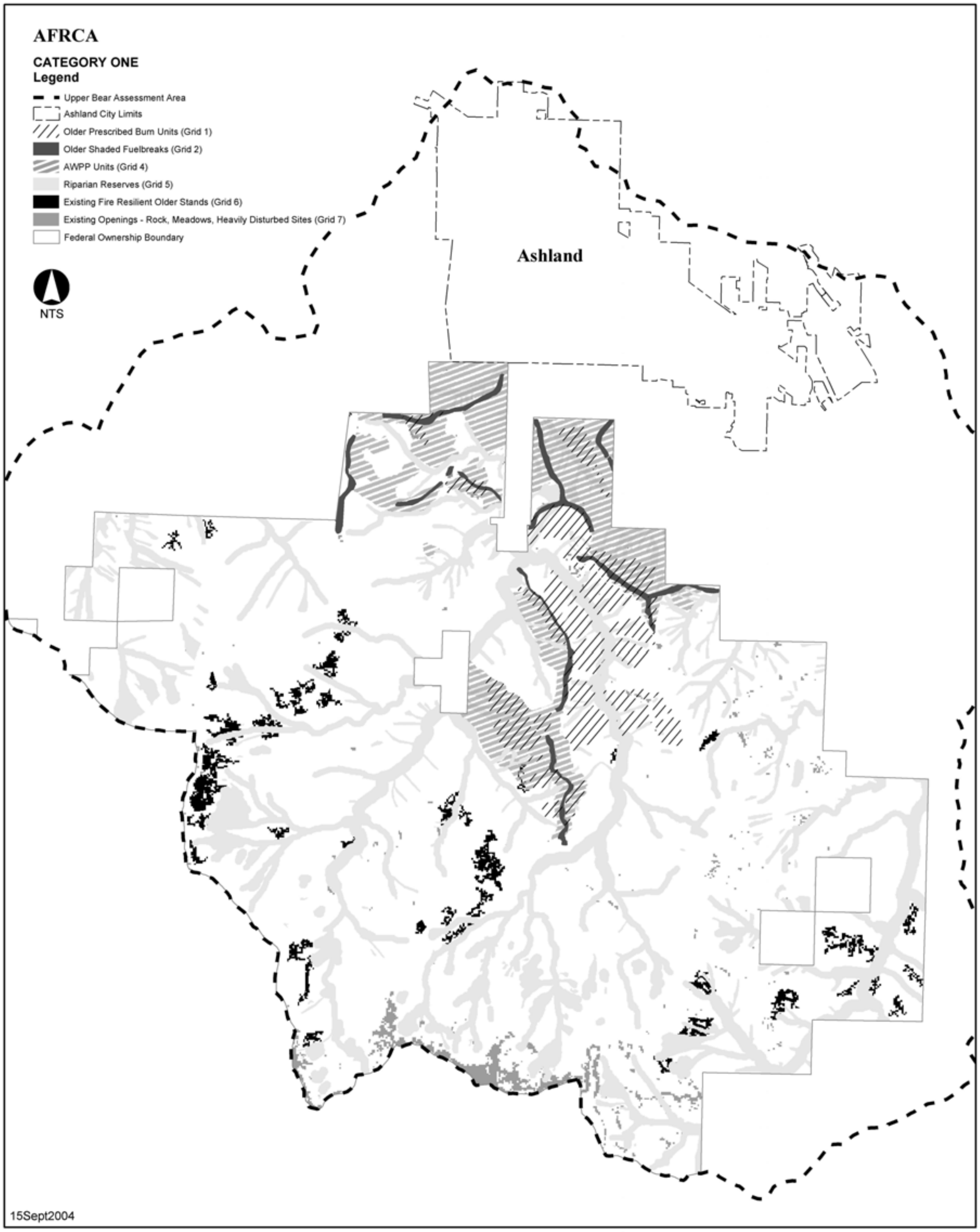
Priority 11— Northern Spotted Owl 1/4 mi. activity centers in low/mid elevation PAGS were identified for some light touch prescriptions to restore late successional habitat benefits for northern spotted owls.

Priority 12—Riparian Reserves in Lower and Middle elevation PAGS within the vicinity of other treatments are a low priority for treatment. The team proposes no treatment in riparian habitat and including a 50 foot buffer, but allow for treatments available to be determined on a site by site basis outside of the riparian buffers in areas designated under the Northwest Forest Plan as Riparian Reserves. Exceptions to the no treatment rule include restoration efforts where previous timber harvest activities entered a riparian area and natural recovery is not occurring.

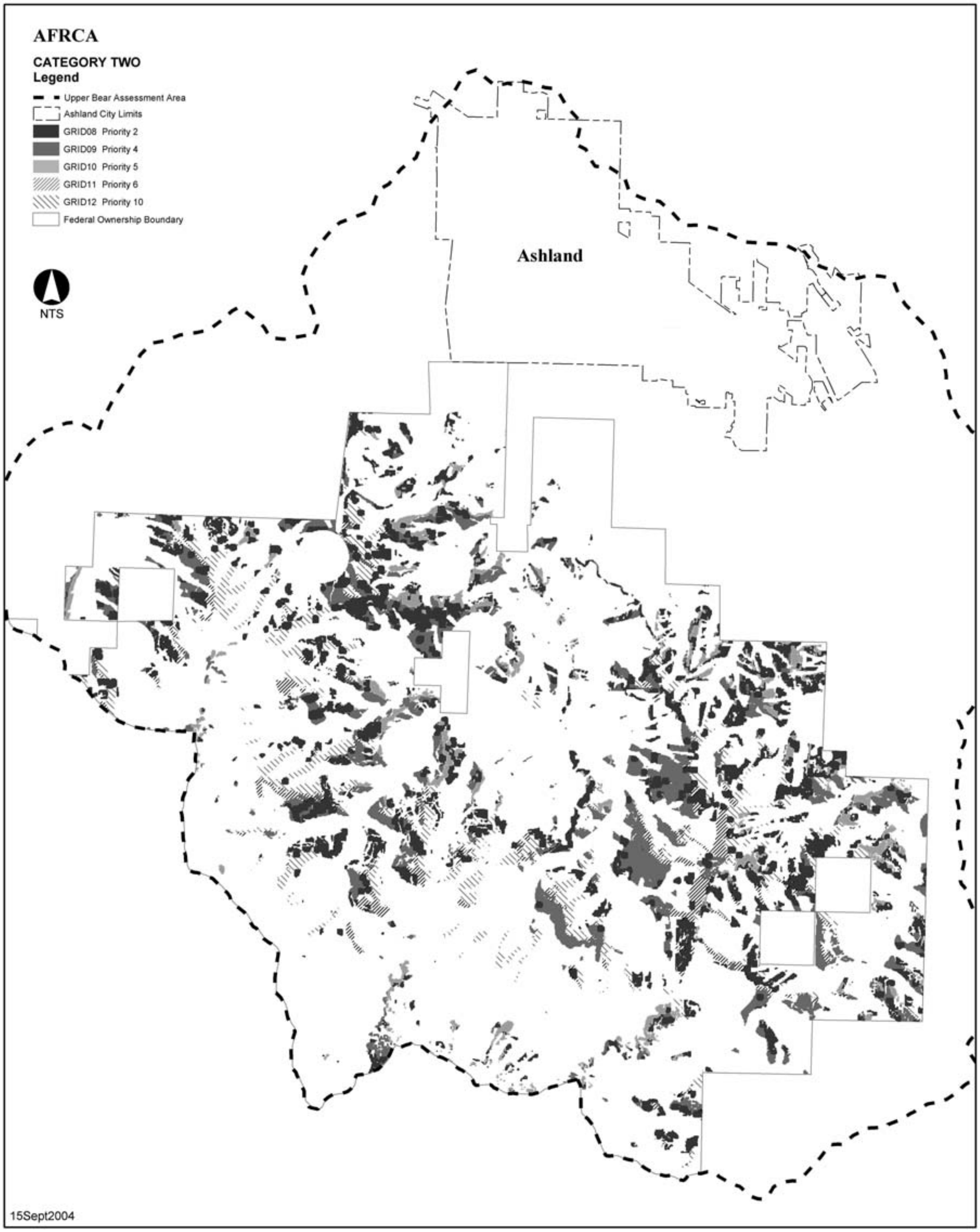
Table 8.1 Treatment areas by category and priority for Ashland Forest Resiliency Community Alternative. Treatment areas limited to federal lands in the USFS AFR Project boundary. Categories were defined by the citizens group in April 2004. Treatment types and priorities were developed by the AFRCA technical committee. Selected settings exclude primary and secondary Landslide Hazard Zones, riparian areas (approximated by Riparian Reserves), steep slopes > 65%, or areas within ¼ mile of spotted owl activity centers, unless noted. Some of these priorities include limited acreage within the McDonald Peak Inventoried Roadless Area (see discussion). Total new treatments, including within plantations is 6583 plus priorities 3, 5, and 11 to be decided (5565 acres). These numbers are subject to limitations of data.

Category 1 **Existing Fire Resilient Areas** **No Treatment**	**Category 2** **("readily" made fire resilient)**	**Category 3** **strategic connections (geographic, ecological, logistical, and social)**
Previously completed USFS prescribed burns. Resiliency of these stands depends in part on time since prior burn and needs to be determined. (1135 ac)	**Priority 2— Ponderosa and sugar pine dominated stands on upper two-thirds slopes within the dry Douglas-fir, moist Douglas-fir, dry white fir, moist white fir, and cool white fir plant association groups.** (1979 ac)	**Priority 1— Ashland Wildland Urban Interface.** Area defined by the first major ridge above the city limits including Clayton Creek to the south, Wildcat Canyon to the northwest, and an area around the Reeder reservoir and water treatment plant. (1196 ac)
Previously completed USFS fuel breaks. Resiliency depends in part on time since creation and maintenance, to be determined. (278 ac)	**Priority 3—Maintenance of previously treated prescribed burns fuel treatments, and shaded fuel breaks from Category 1.** (3367 ac)	**Priority 3— Plantations** **Young stands established in past commercial timber harvest units.** (932 ac total, 167 ac not in other treatment settings)
Previously completed USFS fuel management units of the Ashland Watershed Protection Plan. Resiliency of these stands depends on time since creation and maintenance, to be determined. (1954 ac)	**Priority 4—South and west-facing upper two-thirds slopes within the lower elevation plant association groups** (dry Douglas-fir, moist Douglas-fir, dry white fir). (1213 ac)	**Priority 7— Corridors within 50' of Riparian Area, or ¼ mi of NSO activity center and within 200' of any treatments above**. (1529 ac)
Riparian Areas (used USFS riparian reserve as surrogate). Fire behavior expected to be less intense in relatively moist, protected settings with higher potential for late-seral forest. Some areas treated in Category 3 (4740 ac)	**Priority 5—North and East facing upper one-third slopes within the lower elevation Plant Association Groups**. (decision to treat lands in this priority not yet resolved) (<402 ac)	**Priority 9— Roadside corridors within 100' on either side of roads spanning short distances between other selected units in the lower elevation Plant Association Groups.** (148 ac)
Fire resilient late seral forests, with fewer than 50 seedling and saplings (<7" DBH) per acre. Less intense fire behavior is expected in these stands with few ladder fuels, depending on many factors. (486 ac)	**Priority 6— Middle elevation plant association groups** (moist white fir and cool white fir) on South and West facing upper one-third slopes. (411 ac)	**Priority 11—Northern Spotted Owl 1/4 mi. activity centers in low/mid PAGS** (treatment for owl habitat restoration only) (<1796 ac)
Natural openings: exposed soil, rock, prairie, forb/herbaceous, water (336 ac)	**Priority 10-- Considered but not accepted as a priority—North and East facing upper one-third slopes within middle elevation plant association groups.** (863 ac, not treated)	**Priority 12—Riparian Reserves in Lower and middle elevation Plant Association Groups previously logged areas where natural recovery is not occurring.** (treatment for riparian restoration only) (<900 ac)
Total Category 1 = 5562 (4267 ac to be determined, including <900 ac in Category 3 Riparian Reserves)	**Total Category 2 = 3603 Priorities 3 and 5 (3769 acres) yet to be determined.**	**Total Category 3 = 2980 acres Priority 11 (1796 acres) is yet to be determined.**

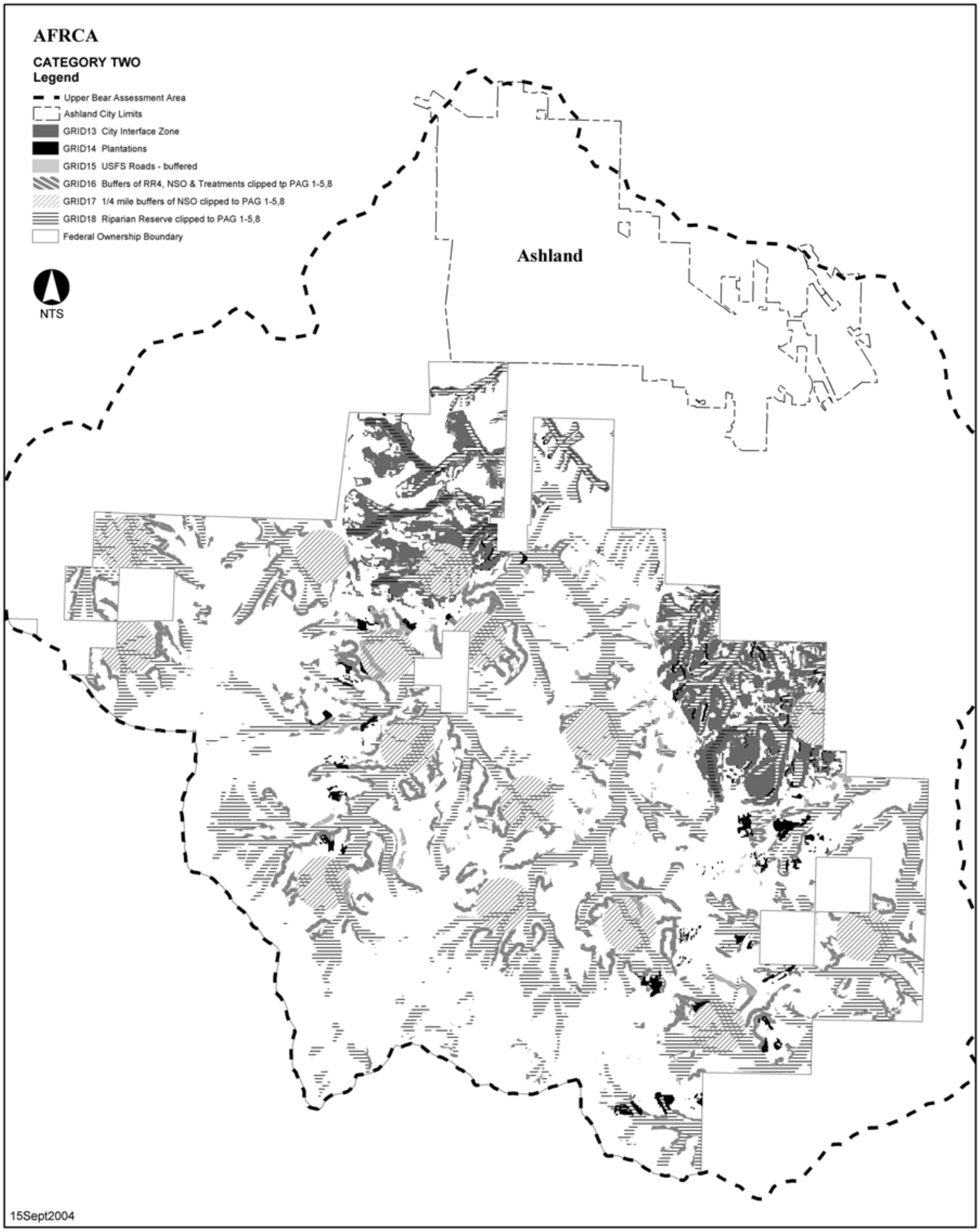
Map 8.1. Category 1 lands in the Ashland Watershed analysis area.



Map 8.2. Category 2 lands in the Ashland Watershed analysis area.



Map 8.3. Category 3 lands in the Ashland Watershed analysis area.



Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

<u>*Improving Fire Resiliency and Providing Strategic Connections: Analysis Issues*</u>

Plant Association Groups (PAGs)

The Ashland Watershed exhibits an abundance of diversity in vegetation as a result of the environmental gradient that exists from the lower to the upper elevations. The watershed was stratified into PAGs (Map 8.1) to facilitate discussion and needs, in the different environments, to establish or retain ecosystem health. These PAGs are described in the Upper Bear Assessment (Rogue River-Siskiyou National Forest 2004). They are based on groupings of plant associations that occur in similar environments. We recognized the following PAGs (Map 8.4):

Oregon White Oak
Ponderosa Pine
Dry Douglas-fir
Moist Douglas-fir
Dry White Fir
Moist White Fir
Cool White Fir
Mountain Hemlock

For the purposes of our analysis we combined the Oregon White Oak and Ponderosa Pine within the Dry Douglas-fir PAG. Treatments were considered only in the lower and middle elevation PAGs, excluding the Mountain Hemlock

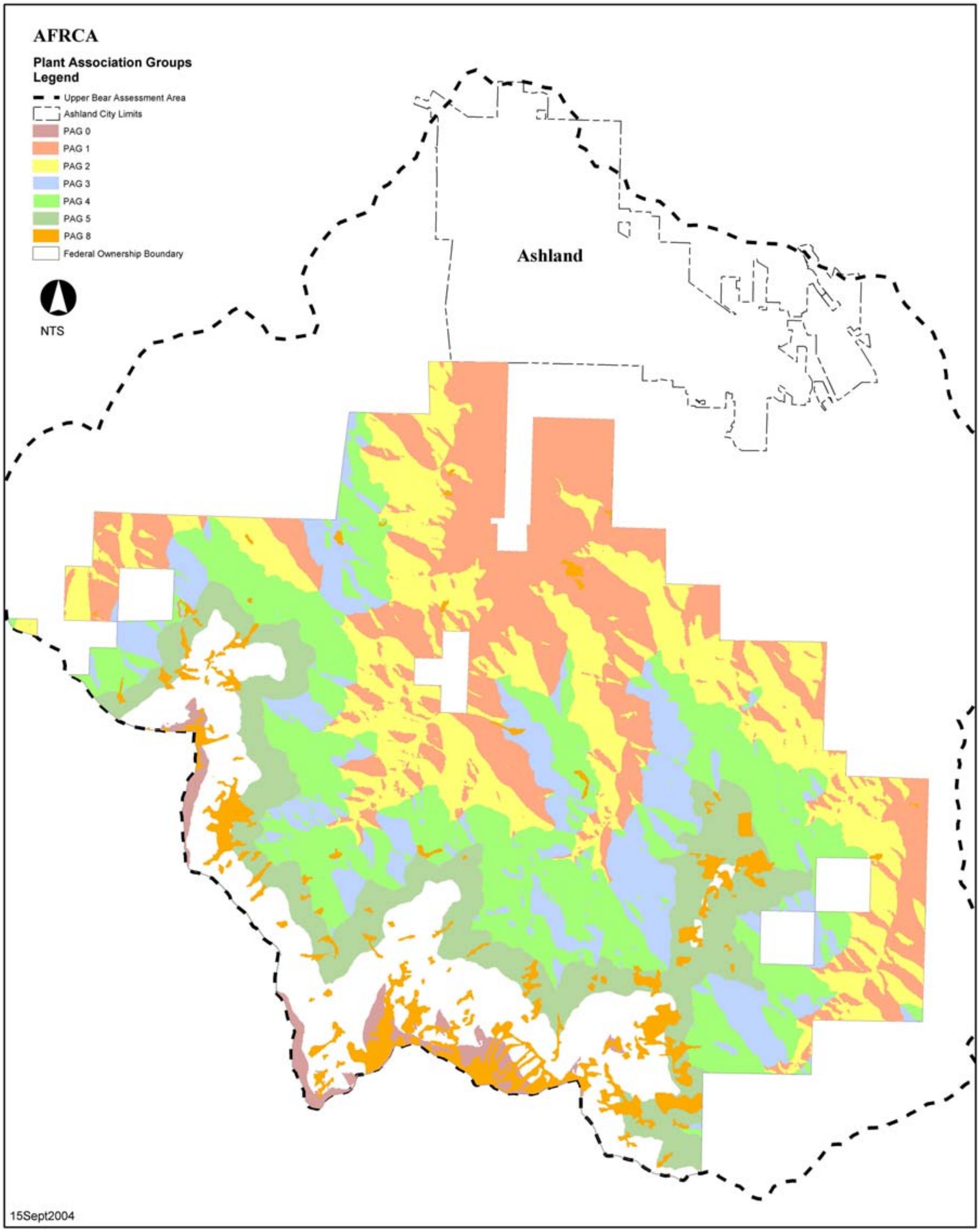
Historic Conditions in the Ashland Watershed

Complete knowledge of historic vegetation conditions is difficult to determine. However, general forest conditions for the Ashland watershed can be inferred from the work of Leiberg (1900) and can be directly documented from the Oregon and California (O&C) Revestment Notes compiled by the General Land Office (circa 1920) (Appendix 8.2). These vegetation records do not provide a full history of the changes in plant communities within the Ashland Watershed, but do provide a "snapshot in time" both in a general and specific context for vegetation conditions within the Ashland Watershed. The records are from a time prior to when European Americans influenced many changes in the watershed. By comparing these records with current conditions, a trends analysis for vegetation change can be developed.

Leiberg described the Ashland Watershed as highly dynamic, with fire "having run throughout the forest," His limited data points to the presence of few white fir in the watershed, and those that were present, likely occurred in draws, as he noted around the region. His data point to the dominant role of ponderosa pine and Douglas fir in the watershed. The Watershed was described as a highly variable plant community

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

Map 8.4. Plant Association Group (PAG) map used for the Ashland Watershed analysis area.



assemblage. Leiberg observed that most of the watershed showed evidence of having been burned, but to a limited extent since 1887. He estimated that 12 percent of the township covering the upper watershed showed evidence of having been "badly burned" (likely including moderate and high severity fire effects). Badly burned areas accounted for 18 to 36 percent of the surrounding townships.

The Revestment Notes, from the Interface Forest showed about 40 percent of the area had some signs of burning and about 66 percent of the burned area had high severity fire. Late seral conditions were present on 12 percent of the area and occurred in the Ponderosa pine and white fir plant series. Pine species and madrone were very common in this part of the watershed. In the Montane Forest (mountain hemlock plant series), 29 percent of the area was late seral. No acres were recorded as having burned.

A comparison of current conditions to the historic indicate increasing abundance of white fir, reduction of pine, increasing density, and the relative absence of fire. Although the strategy of AFRCA will encourage the functioning of fire and ensuing conditions that trend more toward historic condition, our strategy is focused primarily on structural manipulations prescribed to reduce either horizontal or vertical continuity of potential fuels and to reduce the potential for stand replacement fire in the municipal watershed. Such a strategy will only have a short term effect if not followed by ongoing active management that includes extensive use of prescribed fire and prescribed natural fire.

Coarse Woody Material (Snags and Down Wood)

Coarse woody material (CWM) fulfills a number of important ecological functions such as stabilizing surface soils, increasing organic content in soils over the long term, providing habitat for the many organisms that depend on snags and down logs in various stages of decay, and ensuring adequate large woody debris recruitment to meet the ecological needs of aquatic systems over time.

Past management in the watershed has changed the recruitment and accumulation of snags and down logs. Mortality salvage immediately changed the forest structure by removing snags and subsequently changes the recruitment and accumulation of down logs. Fires play a key role in mediating the recruitment, accumulation and reduction of snags and down logs. With fire suppression and longer interval between fires, the composition and processes of coarse woody material changes. Down logs gain a longer residence time as they decompose rather than burn, increasing their overall abundance, while fewer snags are created and trees downed by fire (AFLC 2003). At the same time, with increased density in stands, mortality resulting from drought stress, insects, and disease is increasing by an order of magnitude. How these conflicting impacts have changed the dynamics of coarse woody material is inadequately understood. Therefore, this proposal starts with the assumption that all snags and down logs serve important ecological roles and therefore should be retained.

The general strategy in AFRCA is to conserve snags and down wood by retaining them on site. When specific management considerations (such as proximity to fire control lines, fire manager safety, application of prescribed fire, rural interface, and the potential for insect outbreak) trigger a site-specific need to reduce coarse woody material, the material may be removed, provided the ecological needs for coarse woody material have been satisfied.

Snags

Large snags over 21 inches dbh are particularly essential for forest function. In addition, at least 96 wildlife species in Oregon and Washington are associated with snags in forests, using snags for shelter, roosting and hunting. Most species use snags greater than 14 inches dbh (Rose et al. 2001). Ridges, upper thirds of slopes, and riparian areas or lower third of slopes are very important for late successional dependent species such as fishers and other forest carnivores, as well as bats. Clusters of snags are especially important.

Snags on ridges are essential for bats and whiteheaded woodpeckers[3]. Bats generally are thought to prefer snags near ridge tops for day roosts. Snags taller than the general canopy are thought to be preferentially used by bats, particularly as maternity roosts with these snags providing the warm microclimate necessary for rapid fetal and juvenile development.

In riparian areas and upslope areas prone to landslide, snags of all size classes contribute the large woody debris that is critical to creation and maintenance of stream structure and function. Recruitment of graded inputs of large woody debris to streams provides important support for aquatic ecosystem integrity, impacting physical habitat structure as well as nutrient cycling and other in-stream processes. Snags in various size classes also are important to the recruitment pathways of the down coarse materials important to soils.

Snags also can compromise wildfire suppression activities and the efficacy of fire control lines by increasing the rate of spread of a fire through firebrand production (spotting) at their tops. This can result in a significant safety hazard that can limit or prevent personnel deployment into critical fuel management zones (AWSA 1999). Similar problems can occur during prescribed fire, but in those instances these concerns can be accommodated more readily with preplanning and treatment design.

Down Wood

As with snags, down logs are important for wildlife and aquatic ecosystem function. In addition, down coarse woody material is particularly important to maintaining and holding soils in place throughout the project area. A further discussion of coarse woody materials as they specifically relate to soil productivity is addressed under the "soils conservation" analysis issue. Consistent with retention goals for snags, down coarse wood will be retained to support forest function. In this proposal, down logs can be considered available only when all site considerations have met and in accordance with the following section titled "Large Tree Retention".

In general, this proposal would maintain down logs within the upper one third of the range for down logs for that PAG, with more logs retained in riparian areas and on northerly aspects than on southerly slopes. Where standing green trees are felled to meet habitat objectives, felled trees will be left in place as needed to meet down log and/or soil objectives.

[3] The existence or abundance of whiteheaded woodpeckers in the Ashland Watershed is uncertain.

Hardwoods

Unlike many past forest management projects that tend to encourage conifers, we intend to more broadly promote ecosystem functioning. Hardwoods are a critical part of the species mix and may require non-traditional practices to maintain their roles in watershed protection and ecosystem function. Their role includes increased wildlife habitat, forage production, and species diversity, and better soil functioning. The hardwoods keep the soil and site more balanced in plant nutrients by recycling cations (conifers recycle anions). Perhaps most importantly, following high intensity disturbance slope stability and subsequent watershed values are increased when there is an appropriate hardwood mix (i.e. as a result of active rooting and stump sprouting).

Since hardwoods have the ability to sprout and hold soil after fire, areas with soil conservation concerns (LHZs) are places where hardwoods should be encouraged. Oregon white oak, California black oak, Pacific madrone, and golden chinquapin are the primary hardwoods in the project area, and larger individuals of these species (16 inches DBH and greater) are high priorities for retention and promotion. Special efforts to maintain hardwoods in developing stands are an important part of this proposal. Thinning around these remnant hardwoods is designed to increase their vigor, particularly since they tend to be shade-intolerant and easily overtopped by younger developing conifers in many situations. Removal of conifers from around preferred hardwoods should be dependent on the ability to remove them without damaging the preferred hardwood. On the other hand, small hardwoods, particularly Pacific madrone, are believed to have significantly increased in numbers since effective fire suppression and generally are less desirable for retention trees, as well as potentially competing significantly with other larger and/or more preferred trees.

Leiberg (1900) indicates that around a century ago only 5 percent of the total basal area was made up of oak and madrone (in T39S, R1E), whereas data from City of Ashland plots indicate amounts ranging from 25-70 percent on lands managed by the city in low elevation portions of the watershed, largely in smaller size classes. Revestment Notes show 80 percent (920 acres out of 1,300 acres) of the interface forest had madrone present. Coupled with Lieberg, this indicates that while madrone was abundant circa 1920, at that time it did not provide much basal area. It is probable that much of the hardwood documented by Leiberg and the Revestment Notes was small diameter and likely initiated by resprouting after fire events in 1901 and 1910. Designed retention and promotion of hardwoods may vary by size, PAG, species, and associated vegetation conditions. Hardwoods of all species are particularly important components of stands and vegetation on more southerly to westerly aspects in the project area, while Pacific madrone is important on more northerly aspects on lower and mid elevations.

Soils Conservation

The soils within this project area are derived from a granitic batholith and are highly erosive due to their sandy and easily detached textures. Their nutrient and water holding capacity, which controls site productivity, is greatly influenced and supplemented by the soil humus in the topsoil. The key to maintaining and holding these soils in place and to maintaining the needed soil humus is to maintain proper ground cover. Monitoring has shown that these soils are severely erodable if left without surface protection in the form of duff/litter (woody material) and live plant cover. They also are easily eroded if runoff water is allowed to concentrate into rills or gullies on the hill slopes and in drainage ways. Soil erosion rates and the frequency of landslides are strongly associated with slope steepness. Slopes steeper than 70 percent are 20 times more likely to fail than slopes between 50 and 70 percent, and are 200 times more likely to fail than slopes less than 50 percent. Slopes less than 50 percent do not fail very often. Erosion rates on roads and landings were 100 times those found on undisturbed areas, while erosion on harvested areas (clearcuts) was seven times that of undisturbed areas (Amaranthus et al. 1985). From a soil erosion perspective, slopes 65 percent and greater are particularly vulnerable to damage from land management activities. In addition, some soil types are especially vulnerable to being compromised by ground disturbance (particularly as a result of machinery use) regardless of the slope. As a consequence, treatment options must be guided by soil sensitivities so as to ensure the long-term productivity of the soils are protected.

Douglas-fir Dwarf Mistletoe

Douglas-fir dwarf mistletoe (*Arceuthobium douglasii*), a native, host-specific parasitic plant, is well established in Douglas-fir trees of all sizes, and it is particularly noticeable in the White Fir PAGs and Douglas-fir PAGs. The ecological functions and benefits of dwarf mistletoe are widely documented. In the Ashland Creek watershed, every northern spotted owl nest occurs in a mistletoe broom.

The objective of AFRCA is to reduce some amount of mistletoe in pursuit of overall project goals, while retaining this important habitat component where it is most beneficial to late successional forest associated species, including northern spotted owl and Pacific fisher.

The incidence of dwarf mistletoe infections in Douglas-fir plant series has been observed to increase during the period of fire exclusion (Hadfield et al. 2000). An increased abundance of dwarf mistletoe brooms in Douglas-fir stands may create ladder fuels and increase the potential intensity of wildland fire. Moreover, infection of younger Douglas-fir in the short term may limit their lifespan, thereby reducing recruitment of mature Douglas-fir in the future and facilitating a compositional shift toward white fir. White fir tends to grow in multiple layers with relatively high crown bulk densities, characteristics that may exacerbate potential wildland fire behavior under some conditions. Observations of mistletoe infections in southwest Oregon and in the project area over many years, coupled with a basic conceptual model of the biological processes associated with this parasite, suggest that similar dynamics such as described above exist in the project area (D. Goheen, K. Marshall- personal communication).

The location and scale of dwarf mistletoe infections influence their priority for management, as mistletoe infections may conflict with ecosystem-level goals only if their abundance and effects on vegetation become uncharacteristic at broad spatial scales. In other words, mistletoe infestations pose problems only if their abundance and effects on vegetation are found to be uncharacteristic at a watershed scale or jeopardize the potential to realize project goals.

The abundance of dwarf mistletoe-infected, large Douglas-fir trees should continue to provide nesting habitat for wildlife as well as a continuing supply of coarse woody material. Dwarf mistletoe brooms are particularly important for wildlife nesting at lower slope positions and canyon bottoms (D. Clayton, pers. comm.), suggesting that retention should be emphasized there. At upper slope positions, where aerial spread of the parasite is more pronounced and wildland fire management goals may be more readily compromised because implementation of prescribed fire becomes more difficult, dwarf mistletoe can be managed to meet project goals.

A suite of management options is available including pruning, girdling, cutting, etc. The overriding guideline for dwarf mistletoe management in the AFRCA is to assume that infected trees possess wildlife habitat values that should be retained. Cutting or removal of such trees must directly contribute to the realization of project goals (e.g., to facilitate safe and effective use of prescribed fire). Retention of the critically important wildlife habitat values associated with mistletoe (including snag and down log recruitment) should be weighed against risks of intensified wildland fire behavior, species composition shifts, and long-term potential for lost recruitment of large, live Douglas-fir trees at a landscape scale.

Determining appropriate dwarf mistletoe management will depend on an accurate inventory of existing infections by location and severity, as well as a satisfactory delineation of amounts needed to maintain wildlife habitat values.

Treating Activity Fuels

During stand treatments (understory slashing, pruning, and thinning operations), activity fuels will be created. Because silvicultural treatments without follow-up slash treatment only aggravate wildfire potential and behavior, activity fuels will be managed on all units to reduce subsequent fire behavior. Most commonly, this will be a type of prescribed fire application, but there may be some instances where post-treatment fuel loading is light enough that prescribed fire is not necessary, or the site is sensitive to surface erosion and would be protected better by not burning. In the latter case, some other treatment, such as lop and scatter, may be prescribed. Prescribed broadcast underburning is the desired style of fuel treatment in the project area (when feasible), as it more closely imitates the effects of natural disturbance. However, given the excessive fuel loads, the potential risk of escape, and limited windows of opportunity when conditions are within prescription, smoke management issues and other concerns, hand piling and burning likely will be the most common treatment. Once initial silvicultural and activity fuel treatments are completed, it is hoped that prescribed fire will be utilized extensively in a long term maintenance program, returning low to moderate intensity fire to more of its historic role as an ecosystem disturbance process.

Wildland Fire Restoration

Fire is a key ecological disturbance in forest ecosystems of the Siskiyou Mountains, with species and communities having evolved with periodic fire disturbances, including some that depend on fire disturbance for their persistence. It follows that the integrity of the Siskiyou forests depends on the extent to which land managers allow fire to play its keystone role in the ecosystem. Forest systems that historically were maintained by frequent, low intensity fire have declined with fire exclusion. Further, naturally regenerated early successional forests, with their complex coarse woody structure and non-woody vegetation, may now be the scarcest of all habitats in the Pacific Northwest due to decades of fire suppression and post-fire salvage logging (Lindemayer and Franklin (2002).

Recognizing that wildland fire is “a critical natural process [that] must be reintroduced into the ecosystem,” the 1995 Federal Wildland Fire Management Policy and Program Review and the

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

2001 Review and Update of the Federal Wildland Fire Policy ("Federal Fire Policies") commit agencies to shift away from systematic fire exclusion and to use prescribed and natural wildland fire for restoration of fire-adapted ecosystems. Use of management-ignited prescribed fire can help to sustain ecological functions that have been limited or rendered dormant by fire exclusion, and it has been used effectively in the restoration and maintenance of wildlife habitat. Because prescribed fires are typically conducted at relatively low intensity, they do not replicate all of the ecological functions of lightning-ignited fires that burn in a full range of environmental conditions. To minimize risk of escape, land managers in the region conduct prescribed fires during the wet season (late fall through spring), yet little is known about the potential detrimental ecological effects of burning outside of the dry season (see Appendix 8.3 for detailed discussion).

Dependent on vegetation characteristics, prescribed fire can be the most effective means to ameliorate wildland fire behavior. The amount, continuity, porosity and moisture content of fine and intermediate-sized fuels (less than 3 inches in diameter) influence the rate of heat energy released by the flaming front as well as the rate at which it spreads (Rothermel 1983). The ability of prescribed fire to consume fine and intermediate fuels smaller than three inches in diameter is a distinct advantage over other fuel reduction methods. Prescribed fire consumes dead surface fuels, and, depending on vegetation conditions and weather parameters prescribed, can be used to reduce the continuity of both dead and live ladder fuels that may facilitate vertical movement of fires into thee overstory tree crowns.

Many constraints on the use of prescribed fire tend to limit the area treated on an annual basis. The risk of escape and the associated liability for losses, along with difficulty in meeting air quality standards with smoke from fires are two critical factors. Concern over safety, access, control, mop-up, access to adequate work force and other resources add to the complexity of staging a prescribed fire. While prescribed burning can be cost effective in some settings and offers certain advantages over manual fuel reductions, its effective use is currently limited to systems that have low intensity fire regimes. In other settings fire managers typically opt for pre-treatment of fuels in stands with continuous, abundant fuels and ladder-like structure to ameliorate the potential fire behavior and increase the probability of successful retention of live trees. Consideration of longer term benefits, such as savings in future suppression costs and decreased resource losses, as well as enhanced long-term opportunities to use naturally-ignited fires for ecosystem restoration could be used to justify the difficulty and cost of using prescribed fire more in the near term.

Reintroduction of prescribed and naturally ignited fire to the Ashland Creek watershed is critical to restore forest ecosystems because it supports natural, dynamic interactions between ecosystem structure and process. Wildland fire offers distinct advantages over other management options in terms of restoration of landscape structures and spatial patterning, and reflects one of the overall goals of this project, to restore wildland fire as a natural process in the watershed. The most appropriate places to implement landscape-scale fire restoration treatments include roadless areas and large blocks of lightly roaded areas where risks to human life and property are low, such as the lands outside of the wildland - urban interface in the Ashland Forest Resiliency planning area,

At this time, the Rogue River National Forest's Fire Management Plan (FMP) covering the project area does not provide for use of naturally-ignited fire for resource benefit, or Wildland

Fire Use (WFU). The high probability of stand replacing wildfires was considered inconsistent with certain objectives, agreements, and standards and guidelines. Yet, the Forest recognizes that continued exclusion of wildland fire "will lead to increased conifer mortality and increased risk of large-scale stand-replacing fires" (USDA 1996, 48). Instead, the current FMP calls for a Level 1 suppression response to all wildland ignitions regardless of location or environmental conditions. Since 1960, nearly 75 lightning ignitions in the watershed have been suppressed, with only four fires that burned more than an acre (1973, 350 acres; 1987, 13 acres; 1988, 60 acres; and 2003, 15 acres) (Upper Bear Assessment, 2003).

In light of the fuels reduction and structural restoration proposed in this plan, a renewed assessment of the modeled fire behavior and severity of effects at different times of the year, and the perception of inconsistencies with other management objectives, guidelines, and agreements, could identify opportunities for appropriate implementation of WFU. Managing naturally ignited fires burning in relatively mild weather conditions, in favorable topographic locations with pre-planned boundaries could benefit biota directly, conserve financial resources, reduce fire hazard to workers, reduce the cumulative impacts of systematic fire suppressions, and temper the both the severity of fire and the urgency to suppress fire in the future.

This proposal encourages the Forest Service to update the FMP for the Mt Ashland Late Successional Reserve, North Zone FMP with appropriate prescriptions, fire management units and authorization for line officers and incident commanders to use wildland fire and appropriate fire suppression strategies as conditions are restored where such actions do not threaten the critical values held for the watershed. The Ashland Forest Resiliency Project environmental impact statement is an appropriate planning document to make this change as the fuels and structural treatments proposed will facilitate such management.

Fire resilience is an elusive concept and iterative management and assessment will be required in order to determine where along the spectrum of fire resilience systems are at any one time. For this reason, this proposal offers a relatively modest adjustment of fuels and vegetation, spread out over space and time, in order to move us more closely to this idealized condition of fire resilience. It is hoped that the fuel discontinuity network forming the basis for this proposal will provide the geographic location (organized by plant association groups) of important first action.

It is understood that, at least initially, opportunities for prescribed fire and use of naturally ignited fire will be limited, such that other forms of vegetation manipulation will be required to move the project area closer to fire resilience. We view silvicultural and/or structural manipulations of vegetation as a form of pre-treatment that enhances the opportunities to use fire. The precise assessment of acres requiring silvicultural manipulations prior to application of prescribed fire must be determined on the ground on a site-by-site basis.

Noxious Weeds

Invasive nonnative species alter the composition, structure, and processes where they invade native systems. Some species already are established in the project area, particularly, hedge hog dogtail grass (*Cynosurus echinatus*), scotch broom (*Cytisis scoparius*), bull thistle (*Circium vulgare*), dalmation toadflax (*Linaria dalmatica*), among others. Weed species may spread by taking advantage of disturbed habitat adjacent to or in the proximity of existing colonies. Roads and vehicle use can be an important vector for the spread of weeds. Informing implementation plans with the location and extent of existing weed colonies, along with control actions prior, during and after treatment can help avoid spreading them to new areas.

Owl Activity Centers

"Core" areas are described around nest locations used by pairs of Northern Spotted Owl, a species listed as threatened by the USFWS. These areas, typically containing the key constituents of the species required habitat, are vital to the successful breeding of the species. Habitat connectivity also is considered important for dispersal and migration of owls and other late successional associated species. The maintenance of late seral or old growth conditions in riparian areas serve as corridors linking together other areas of preferred habitat as well as adjoining northerly aspects that often support such habitat. Management activity nearby or within owl core areas may disturb nesting pairs if conducted during the critical nesting season, and if not conducted in a sensitive manner, could reduce important habitat components. This plan intends to maintain effective or improved owl core areas, and to improve the fire resiliency in strategic locations around such areas according to landscape treatment priorities and as prescribed.

Owl "cores" are defined at two scales, within 0.25 miles of an activity center (generally a nest stand) and from 0.25 to 0.5 miles out from the activity center. The first scale is to be managed as optimal habitat for nesting and foraging, commonly defined as a stand with a high canopy closure, a complex structure, large snags and trees and a multi-storied canopy. Areas beyond this will be managed as optimal habitat where it currently exists, and may be further treated to create a fire-resilient stand. The strict "core" areas (activity center out to 0.5 miles) may be somewhat dissected by ridges that support less suitable habitat. Suitable habitat is more often found on lower slopes and riparian areas and less often located on upper one third slopes and southern exposures, areas that historically supported more open and less suitable habitat.

Riparian Areas

Riparian areas are dynamic portions of the landscape shaped both by disturbances characteristic of upland ecosystems (e.g., fire, windthrow, erosion and landslides) and those unique to stream systems (e.g., lateral channel erosion, flood and debris flow deposition). Important ecological functions that must be conserved include storage, processing and delivery of organic materials into the stream; maintenance of bank stability and shading; delivery of large wood to streams and to riparian areas; establishment of riparian microclimate; maintenance of water quality (particularly as it relates to temperature and sediment); provision of wildlife habitat; and moderation of hydrologic disturbances. Riparian habitat conditions, and as a consequence aquatic habitat conditions and water quality, are susceptible to degradation by management. Even fuel reduction treatments may alter the hydrologic function of the watershed by contributing to chronic disturbance, and or elevated rate of disturbance that exceeds the rate of recovery. These impacts to long-term aquatic ecosystem integrity can be greater than would result from a wildfire burning through the system. Where riparian and aquatic habitat has been degraded by past timber harvest and is not recovering naturally, however, management in and around riparian habitat can be used to restore conditions.

As a consequence, those portions of the landscape necessary for protection of riparian function will not be subjected to ground disturbing activities so as to avoid disruption of riparian processes and functions. Except for previously harvested areas, where special considerations are provided below, riparian area protections will include:

- areas dominated by riparian vegetation, We also have added 50 foot no treatment buffers outside of the areas of riparian vegetation. The buffers won't be treated either.
- lands important to the recruitment pathway of large woody debris (both directly to the stream as well as to the riparian area) and sediment, and
- headwater riparian zones.

Previously Harvested Areas

Extensive acreage, yet unmapped or quantified, has been subject to various styles and intensities of partial cutting. Harvested areas have had a relatively recent disturbance compared to the watershed as a whole, which has not been disturbed in approximately the last 100 years. In some situations, management of previously harvested areas has potential to develop stand structures that resemble more fire resilient, late seral conditions. Partial cutting has to varied degrees, helped create structures and density conditions more similar to the historic forests that were subject to more frequent fires. These areas fall into our Category 2 lands. These thinned areas may confer some degree of current fire resiliency and are priorities for thinning and maintenance of logging slash and early seral vegetation. Such areas are scattered around the watershed.

Just over 900 acres within the watershed have been clearcut and reestablished as plantations. Plantations are listed in Category 3, priority 3 in the treatment table (8.1). Plantations are considered a fire hazard in their current dense condition and threaten nearby surrounding uncut stands with increased potential for delivery of more intense fire. However, due to their early seral condition, stand management in plantations could contribute to rapid development of stand trajectories that encourage development of late seral, fire resilient conditions, by a combination of no treatment and multiple thinning regimes within the same unit.

Stand Density

Inventories completed on both City of Ashland and USFS lands indicate that in most situations stand densities are high to extreme, with relative densities[4] of 0.6 to 1.0 (a range that brackets the beginning stage of competition-related mortality and the theoretical maximum) very common. These conditions result in increased stress and reduced vigor and growth among the trees of the stand increasing their susceptibility to the effects of insects, parasites, and fungi. These conditions result in a disadvantage for shade intolerant, fire tolerant species. In the absence of fire, and with increasing duration of the fire free period the increasing proportion of the watershed in this density range increases the potential and concern about a rapid widespread wave of insect mediated mortality that will disproportionately affect the oldest cohort of trees.

It is suggested that identified stands within this range be prioritized for treatment in order to improve retained tree vigor, particularly of preferred larger trees of preferred species. Thinning should be "from below", creating stand structure that facilitates return of natural disturbance processes and creates fire resiliency. It is suggested that in many cases, this thinning should be done in stages to slowly release stands from the excessive densities that have existed for many years and to minimize detrimental effects on soil productivity. This strategy has been successfully employed on City of Ashland lands in the watershed, with staged removal of non-

[4] Relative Density Index is a method to measure quantitative differences in stand densities.

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

commercial and commercial size classes determined on a stand-by-stand basis. Coupled with ensuing slash treatment, this strategy has both improved vegetation (stand) vigor and reduced wildfire potentials on an area-wide basis. It is also important to retain untreated portions of the landscape to encourage important structural variation, wildlife habitat, and other important values; maintaining and/or promoting heterogeneity of the vegetation throughout the project is a critical project-level goal.

Stand Structure

Of the three characteristics that traditionally describe forested stands, density, structure, and composition, structure is the most important of the three affecting fire behavior and severity. The diverse set of stand structures within the project area makes prescription development to achieve wildfire management benefits difficult. Nonetheless, in order for this approach to succeed, existing, desired, and future stand structure must be effectively described in order to assess the effectiveness of proposed treatments. Description of stand structure can be facilitated by delineating each of the various sizes/ages/layers of vegetation in a stand, typically referred to as cohorts. In the project area, combinations of three general cohorts tend to occur as classified below (AWSA 1999):

<u>Cohort #1 - Older, mature cohort</u>

1. Generally 25 to 50+ inches DBH, 150 to 300+ years

2. Tend to be spatially dispersed, occurring singly or more commonly in small aggregations, thereby creating a clumpy horizontal stand structure.

3. Were generally initiated and developed in the pre-settlement era when disturbance patterns were of a more frequent, low to moderate intensity type, creating a greater diversity of age classes.

4. More common in topographical areas that act as fire refugia such as gentle ridgelines and riparian areas.

5. The most common species:
   Oregon White Oak PAG: Oregon white oak, Ponderosa pine, Douglas-fir
   Ponderosa Pine PAG: Ponderosa pine, Douglas-fir
   Douglas-fir PAGs: Ponderosa pine, Douglas-fir
   White Fir PAGs: Sugar pine, Ponderosa pine, Douglas-fir, Shasta red fir

<u>Cohort #2 - Intermediate cohort</u>

1. Generally 10 to 25 inches DBH, 80 to 140 years.

2. Tend to be more spatially and structurally uniform, typical of more even-aged stand structures.

3. Typically initiated following moderate to high-intensity disturbance, such as the 1901 or 1910 wildfire events.

4. Not having been thinned by subsequent fire, this cohort often currently is at excessive stand densities more typical of the stem exclusion stage of stand development, and rapidly declining in growth and vigor.

5. Common species:
   Oregon White Oak PAG: Oregon white oak, Ponderosa pine, Douglas-fir
   Ponderosa Pine PAG: Ponderosa pine, Douglas-fir, California black oak
   Douglas-fir PAGs: Ponderosa pine, Douglas-fir, white fir
   White Fir PAGs: Sugar pine, Ponderosa pine, Douglas-fir, Shasta red fir, white fir

<u>Cohort #3 - Young cohort</u>

1. Generally 1 to 10 inches DBH, 10 to 50 years old.

2. Typical of the stand initiation or understory re-initiation stage of stand development.

3. Tend to be spatially and structurally uniform (e.g. plantations) typical of even-aged stands; a younger example of cohort #2.

4. Most noticeable in stands with recent disturbance history

5. Common species:
   Oregon White Oak PAG: Oregon white oak, Ponderosa pine, Douglas-fir
   Ponderosa Pine PAG: Ponderosa pine, Douglas-fir, California black oak
   Douglas-fir PAGs: Ponderosa pine, Douglas-fir, white fir
   White Fir PAGs:Sugar pine, Ponderosa pine, Douglas-fir, Shasta red fir, white fir

In all stands and treatments described below, the intention is to primarily leave trees that were part of the stand prior to fire exclusion, the first cohort, and to reduce the abundance of younger recruits in the third and second cohorts grown over the last 80 to 100 years.   To maintain diversity of ages and inclusion of multiple regeneration events, and to ensure ongoing stand development, it is important that none of the cohorts are completely removed,

Species Composition

Due to fire exclusion in the watershed, tree species composition has shifted. In those areas of the watershed that historically were typified by vegetation adapted to frequent fire, absence of fire has provided a competitive advantage for the tree species that are both more shade tolerant and fire intolerant. These have displaced recruitment of species that are both shade intolerant and fire tolerant which typically prosper when fires occur more frequently.   As a result, white fir is now more abundant on sites that would have supported Douglas-fir (in White Fir PAGs) and Douglas-fir has moved onto sites where frequent fire favored dominance by pine and occasional oak and madrone (Oregon White Oak and Ponderosa Pine PAGs).   To remedy this change in species composition, pine and hardwood retention will be favored over Douglas-fir retention, and

Douglas-fir retention will be favored over white fir retention in the Douglas-fir and White Fir PAGs.

Historically, both white and black oak is thought to have been more abundant throughout the project area, particularly at low elevation and hot dry aspects.

Without disturbance, black oak is eventually crowded out of the best sites and remains only as scattered remnants in mixed-conifer forests. It rarely exists as an understory tree, especially beneath a closed canopy (McDonald 1990). Retention and promotion of tree form black oak is an objective for the Ashland watershed. White oak tends to occur in soil and aspect setting with a lower potential for sustaining conifers. Nevertheless, Douglas-fir has encroached and overtopped many such oak settings. This plan promotes removing young encroaching conifers except pine and cedar species from the white oak sites.

A species hierarchy is presented for each PAG, favoring those species that are generally part of the first cohort and for which recruitment has declined in abundance with changes in disturbance history over the last 150 years. All of the prescriptions below are designed in part to promote and maximize retention of Cohort 1 trees throughout the project area. Among the second and third cohorts, the largest (height, DBH, or crowns) trees, and large, limby trees that developed in a more open, windy environment will be the priority for retention. Thinning will retain those trees best suited to withstand the more open conditions that will result from the thinning and modified group selection[5].

Inventoried Roadless Area

The technical team made assessments and planned management based primarily on ecological attributes, but adjusted consideration and sensitivities based on social values as well. When mapping areas for treatment, we discovered some of the priority settings included limited acreage within the McDonald Peak Inventoried Roadless Area. The team recognized that treatments in the McDonald Peak Roadless Area would be particularly controversial. Therefore, we minimized the nature of management actions on these lands to prescribed fire and limited "light touch" hand work on small diameter (under 7 inch dbh) understory fuels and vegetation.

General Prescription Categories

The overall objective of the prescriptions proposed is to maintain and restore diversity – structural, compositional, and functional – at all spatial scales. Each of the prescriptions is intended to serve as a starting point for PAG-specific treatments of lands identified as a priority for treatment. Prior to any implementation, an inventory of existing conditions is necessary for each operational unit. Site-specific data is necessary to develop individual unit prescriptions.

Suggested prescriptions in this proposal include Forest Service proposed Ashland Forest Resiliency prescriptions 1, 4, 6, 7 through 14, and 19.

[5] Modified group selection creates growing space around desired reserve trees by removing less desirable trees at a distance which is a function of the crown radius of the reserve tree.

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

General Prescriptions by Analysis Issue Across all Units

REGARDLESS OF PAG, TREATMENTS IN ALL PRIORITY AREAS MUST COMPLY WITH THE FOLLOWING GENERAL PRESCRIPTIONS. When general prescriptions and PAG specific prescriptions intersect in their recommendations, the most restrictive prescription shall apply.

Snag Retention and Removal

Surveys of priority areas will be conducted during implementation to identify where snags are deficient. In such circumstances, select trees of the set not intended for live tree retention may be retained as snags in lieu of removal during thinning. Largest diameter trees not selected for retention will be considered highest priority for snag creation/retention. Snag creation can include blasting the tops, girdling, inoculation with fungi or trees with heavy mistletoe may be left for future snag retention.

If snags are determined to be in excess of the targeted maximums, they will be felled to meet down wood objectives first then subject to evaluation criteria and review for removal (see "Large Tree Retention").

Snag levels on lower slopes will be retained within the upper one third of the range for snags for that PAG as described in the 2003 Upper Bear Ecosystem Assessment. Greater retention on lower slopes will help offset reductions required in areas that are a high priority for wildfire control such as ridge tops and other strategic locations.

Along ridges and upper slopes, snag levels will be retained at current levels (i.e. no additional snags will be created) unless their retention will create a wildfire control hazard. Snags that increase fire hazard will be felled and left on site unless that, in turn, increases wildfire hazard. Snags should be retained as high as possible on slopes.

Snags that extend above the primary canopy, but do not extend above the level of the ridgeline will be priorities for retention.

Areas around clusters of three or more snags are a priority for understory vegetation slashing and pruning. Activity fuels will be hand piled and burned to reduce the potential for ignition around snag clusters.

Down Wood

Maintain existing down wood within the upper one third of the range for down logs for that PAG, with emphasis on greater abundance of wood retained in riparian areas and on northerly aspects (2/3 of total retained) than on southerly slopes (1/3 of total retained).

Where standing green trees are felled, they will be left in place as needed to meet down wood, water quality, wildlife, and/or soil objectives.

Noxious Weeds

A list of target species of concern will be developed. Prior to treatment, Invasive weeds will be mapped, and entered into a GIS database. Treatment of noxious weed populations is required within 250 feet of treatment prior to new disturbance. Treatment plans will prescribe entry routes to avoid weed patches. Vehicle and equipment will be washed prior to entering project areas after any use in other areas with potential for supporting invasive weeds. Post-treatment monitoring is required to detect the spread of existing or invasion of new noxious weed populations. A spreading or a new population shall be treated so it can be controlled or eliminated.

In areas prone to weed invasion, a seed mix of native species will be sown where ground disturbance took place during management activities. Site specific species will be determined and local collections will be made to meet seeding needs.

Soil Conservation

Given the highly erosive nature of the soils in the project area, the following general prescriptions will be imposed (to ensure long-term soil productivity is maintained) on any vegetative treatment.

Machinery use such as tracked and rubber tired equipment can be detrimental on these soil units except on existing roadways without site specific mitigation measures designed to protect the soil productivity and water resources. Their use may be mitigated and some potential mitigation opportunities are:

1. Slopes less than or equal to 20 percent will be the upper limit for ground based equipment on these types of soils. We do not support the use of a "Slashbuster" tracked machine as an appropriate tool for brush or tree thinning anywhere in the project area.
2. Slopes below 20 percent may require one or more of the following mitigation measures which will be included after evaluating site specific conditions:
    a. Use of skid pans.
    b. Skid on the contour.
    c. Remove blades from equipment so that no dozing occurs.
    d. Line to a designated skid trail w/extra coarse woody or large woody debris placed on the trail after operation. Do not water-bar.
    e. Other opportunities may occur depending on site-specific conditions.

No ground-based equipment will be used on slopes between 20% and 75%

1. Slopes 0 to 20 percent: Mechanical use on existing roadways is valid with the prescriptions addressing soil standards and guidelines for the Municipal Watershed. Areas exposed and not having effective ground cover must be protected before the winter weather begins.

2. Slopes 20 to 65 percent: Hand treatments will be used on these slopes. In areas of resource conflicts, mitigation measures designed for soils may be developed.

3. Slopes 65 to 75 percent: No treatment except with site specific rationale. For this slope range the site specific rationale must be developed by geologists in the case of slope stability concerns or soil scientists in the case of soil productivity and surface erosion concerns.

4. Slopes above 75 percent: No treatment areas.

Hand piling of slash intended to be burned will be minimized under the canopy (drip line) of standing green trees to protect feeder roots within the topsoil and important soil humus.

If treatment on a steep slope would otherwise be considered necessary to restore ecological integrity or protect homes, a site specific rationale must be developed to justify any treatment on that site and must incorporate measures to protect soil productivity, water quality and address erosion and slope stability concerns. Such rationale and mitigations of treatments proposed for steep slopes, up to 75 percent, or ground based equipment up to 20 percent will be developed by geologists in the case of slope stability concerns or soil scientists in the case of soil productivity and erosion concerns.

Although site-specific tailoring of prescriptions during implementation is necessary, there are eight soil/landtypes within the project area that require the following different prescriptions.

Specific Soil Prescriptions

Group 1 – Soil Landtypes 890 and 88

These units have soil depth, erosion and slopes concerns. Soil/Landtype Unit 80 includes units that occur on smooth to slightly dissected slopes that range 45 to 80 plus percent. Soil/Landtype Unit 88 includes units that occur as colluvial deposits on steep to very steep, midslope postions below rock outcrops and sharp ridges. Slopes range from 50 to 80 plus percent.

On the slopes greater than 65 percent there will be no treatment. Where treatment is determined necessary on areas with slopes below 65 percent, coarse woody material in the size category of 6 inches plus must be left and felled on the contour with surface contact and randomly on over 10 percent of the area treated. This prescription also will require the maintenance of duff and litter and/or fine woody material (less than 1 inch) over 70 percent of the area treated. Hand-piling slash (material greater than 1 inch) can occur, if piles are kept to 10 percent of the areas or less of the area treated. This may require treatments and hand piling and burning to take place in more than one season or require piles be fed from adjacent piles during active burning. The objective is to prevent the removal of soil humus and duff which is key to the maintenance of the soils productivity and surface stability.

Group 2 – Soil/Landtypes 82, 85 and 89

These units have soil depth, erosion and slope plus dissection concerns. Soil/Landtype Unit 82 includes units that are slightly to moderately dissected slopes ranging from 60 to 80 percent. Soil/Landtype Unit 85 includes units that occur on short, steep slightly to moderately dissected slopes of 35 to 70 percent. Soil/Landtype Unit 89 includes units that are highly dissected on steep to very steep straight side slopes with slopes ranging from 50 to 80 plus percent.

On the slopes greater than 65 percent there will be no treatment. Treatments in these units on slopes below 65 percent will require leaving coarse woody material in the size category of 6 inches plus felling on the contour with surface contact and randomly over 15+ percent of the area treated. This also will require the maintenance of duff and litter and/or fine woody material (less than 1 inch) over 85 percent of the treated area. Hand-piling slash (material greater than 1 inch) can occur if piles are kept to 5 percent of the area or less. This may require treatments and hand piling and burning to take place in more than one season or require piles be fed from adjacent piles during active burning.

Group 3 – Soil/Landtypes 81 and 86

These units have erosion concerns. Soil/Landtype Unit 81 includes units that are very deep on toe slopes of 20 to 40 percent. Soil/Landtype Unit 86 includes units that occur on smooth gently sloping rounded surfaces, toe slopes, and slope wash deposits with slopes from 15 to 35 percent.

Leave coarse woody material in the size category of 6 inches plus and fell on the contour with surface contact and randomly over 5 percent of the area treated. This also will require the maintenance of duff and litter and/or fine woody material (less than 1 inch) over 75 percent of the area treated. Hand-piling slash can occur if kept to 20 percent of the treatment area or less.

Group 4 – Soil/Landtypes 83 and 84

These units have soil depth and erosion concerns. Soil/Landtype Unit 83 includes units that are relatively shallow but occur on smooth to gentle and rounded ridges with slopes of 10 to 35 percent. Rock outcrops can be common. Soil/Landtype Unit 84 includes units that are similar to Unit 83, however they are slightly deeper soils and occur on mid and lower slopes. Slopes range from 10 to 35 percent.

Leave coarse woody material in the size category of 6 inches plus and fell on the contour with surface contact and randomly over 5 percent of the area treated. This also will require the maintenance of duff and litter and/or fine woody material (less than 1 inch) over 80 percent of the area treated. Hand-piling slash can occur if kept to 15 percent of the treatment area or less.

Group 5 – Soil/Landtypes 92 and 94

These are Riparian and wetland areas. Soil/Landtype Unit 92 includes units that consist of Alder glades and rare riparian areas. Soil/Landtype Unit 94 includes units that are perennial wet meadows and marshlands.

Because of the risk to long-term soil productivity and water quality, these riparian units will receive no treatment.

Group 6 – Soil/Landtypes 52 and 55

These units have soil depth, erosion and commonly wetness concerns. Soil/Landtype Unit 52 includes units that are associated with rounded, gentle to moderately steep, smooth, glacial depositional surfaces with slopes ranging from 15 to 45 percent. Soil/Landtype Unit 55 includes

units that are associated with flat to gently sloping surfaces associated with glacial trough bottoms and slopes ranging from 10 to 40 percent. Wet areas are common within this unit due to the compacted till material underlying the soil.
Leave coarse woody material in the size category of 6 inches plus and fell on the contour with surface contact and randomly over 5 percent of the area treated. This also will require the maintenance of duff and litter and/or fine woody material (less than 1 inch) over 70 percent of the area treated. Hand-piling slash can occur if kept to 20 percent of the treatment area or less. **Machinery cannot be allowed** on this unit due to internal and external drainage conditions.

Group 7 – Soil/Landtypes 53 and 54

These units have soil depth, erosion and slope shape concerns. Soil/Landtype Unit 53 includes units that occur on compacted bedrock/till material and occur on smooth sideslope glacial depositional surfaces associated with steep, concave cirque basins and headwall areas. Slopes range from 45 to 70 percent. Soil/Landtype Unit 54 includes units that occur on compacted bedrock/till material and occur on moderately to highly dissected and very steep glacial trough walls of 60 to 90 percent slopes. These units are subject to landsliding and require geologic input to the prescriptions.

Slopes greater than 65 percent will receive no treatment. This basically eliminates any activity on Unit 54 due to the small areas of slopes less than 65 percent. Any areas treated within Unit 53 and the rest of Unit 54 will use the prescription for Group 2.

Group 8 – Soil/Landtypes 93 and 95

These miscellaneous landtypes have various concerns due to erosion, soil depth, slope steepness, etc. Soil/Landtype Unit 93 includes units that consist of Rock outcrops and associated talus fields. The will receive no treatment. Soil/Landtype Unit 95 includes units that are seasonally dry meadows and scabland. They are unforested and support grasses, forbs and/or shrubs.

Treatment on areas within this unit will need to be designed after determining site specific needs due to the various physical conditions that occur, such as slopes, aspects and positions that they can occur on. Maintenance of ground cover is extremely important due to the erosive nature of the soils occurring here as well as their very shallow depths. Unit 95 conditions often are the result of past management actions that did not address the soil erosion hazard, and as a result, the soils were severely eroded.

As was indicated above, within all eight Soil/Landtypes protection of long-term soil productivity is dependent upon site-specific tailoring of prescriptions.
Complex Soil/Landtype map units that occur within this area are listed below with their major components. When these complexes are encountered in the field they need to be separated into the individual units for prescription accuracy.

Map unit no.	%	Unit no.	%	Unit no.	%	Unit no.
800	60%	80	40%	92		
802	60%	80	40%	82		
804	60%	80	40%	54		
815	50%	81	50%	55		
820	60%	82	40%	80		
822	40%	82	40%	80	20%	92
828	60%	82	40%	88		
829	60%	82	40%	89		
843	40%	80	40%	54	20%	93
888	50%	80	50%	88		
892	60%	89	40%	82		
898	50%	89	50%	88		

Owl Activity Centers

Treatments within 0.25 miles of owl activity centers will be highly limited unless undergrowth is considered excessive to provide for protection and/or restoration of existing habitat. This situation exists where undergrowth inhibits owls from accessing ground-dwelling prey species over 50 percent or more of any particular stand of 40 acres or more. In all cases, at least 25 – 35 percent of a unit will remain untreated to provide habitat for prey species. Treatments will concentrate on small diameter shrub and tree species that preclude meeting the 50 percent target.

Prior to treatment of owl activity centers, site-specific treatment plans will be developed in consultation with a wildlife biologist knowledgeable in habitat characteristics, and needs of spotted owls and other late-successional dependent species.

Treat only ladder fuels within approximately 0.25 miles around known nest sites (approximately 125 acres per site).

From 0.25 to approximately 0.5 miles from known nest sites (approximately 377 acres per site) other treatment options are possible. As noted in the issue section, the strict “core” areas (activity center out to 0.5 miles) may be somewhat dissected by ridges that support less suitable habitat. Within these areas, based on PAG or slope position, there are a number of different prescriptions identified. The prescription below takes precedence over those prescriptions unless otherwise stated. Variable density thinning around retention pine and hardwoods is a potential treatment in upland areas (upper 1/3 slopes) and on slopes with southern exposures where habitat is not currently suitable for spotted owls. Retain characteristics of suitable habitat and avoid canopy reduction within currently suitable habitat, particularly along riparian corridors and on north slopes. Thinning prescriptions by PAG and aspect can be utilized around leave trees with the following restriction. Relative density treatment within these areas will be at or above the highest relative density identified in the prescription.

In areas without retention pine or hardwood, high pruning, slashing, light understory thinning, and a prescribed fire treatment are recommended. Where appropriate, and only where necessary to meet ecological objectives, general PAG prescriptions may be employed. However, note the canopy and habitat restrictions above. Canopy may be retained in any canopy layer above 20 feet in height and can be composed of any conifer or hardwood species. Within areas that would provide for connectivity between nest sites, such as northerly aspects and riparian corridors, avoid reduction in canopy closure and retain other habitat characteristics generally considered to be important for spotted owls. Retain a multi-storied canopy where it is available.

Douglas-fir Dwarf Mistletoe

Management of Douglas-fir infected with dwarf mistletoe is complicated by its inherent tendency to both promote important late-successional values (e.g., spotted owl nesting sites) while exacerbating processes (e.g., increased wildland fire intensity) and/or successional trends (species composition change) that can detract from project goals.

Several features of dwarf mistletoe can be used to develop successful management practices that may promote goals outlined for the project. First, mistletoe is an obligate parasite that requires a living host to survive. Second, it is generally confined to a single host species. Third, dwarf mistletoe has a long life cycle and generally slow rates of spread. Fourth, dispersal of dwarf mistletoe seed is generally limited to short distances, typically about 10 feet. And fifth, dwarf mistletoe infected trees usually are easy to visually detect.

Potential management practices include:

- Killing infected trees by girdling or cutting them.
- Retaining non-host tree or shrub species between infected and uninfected Douglas-fir trees to prevent or slow spread of the parasite.
- Selecting infected trees for removal in thinning of younger, lightly-infected stands.
- Pruning infected branches, although seldom effective in eliminating the disease due to latent infections, can diminish parasite abundance while raising crown base heights to address fire hazard. This is particularly effective in vigorous trees and stands with low levels of infection.
- Clumping the distribution of infected trees into small groups widely separated from each other, thereby reducing spread.
- Cutting heavily-infected trees that can easily facilitate the movement of fire from the ground surface into tree crowns, particularly in stands that have other large trees of preferred species in close proximity.
- Utilizing potential barriers to dwarf mistletoe spread, such as roads, meadows, rocky outcrops, creeks, species composition changes, etc.

Management of dwarf mistletoe-infected trees can be avoided at lower slope positions where reduced spread rates and spotted owl nest sites tend to occur. A much lower priority for management exists in relatively vigorous even-aged stands that feature limited Douglas-fir understories or understories dominated by non-host species. Treatments generally are more appropriate at upper two-thirds slope positions and in multi-layered stands with infected overstory trees.

From a fire management perspective, dwarf mistletoe management can reduce vertical fuel continuity through broom pruning or felling of heavily-infected trees. Management also can reduce horizontal fuel continuity through felling or removal of infected trees in small created openings subject to the retention preferences discussed above.

Thinning around vigorous, lightly infected trees also can promote long-term availability of wildlife nesting trees. Infected trees with branches able to support large brooms are particularly important features to retain for potential spotted owl nest sites (Marshall et al. 2003).

The complicated nature of Douglas-fir dwarf mistletoe management, particularly given the multiple and sometimes conflicting goals of the project, necessitates decision-making on a site-by-site basis during the implementation phase. The decision-making process will require a spatially explicit inventory of mistletoe infections at a landscape scale to support assessment of the need for treatment at a stand scale. Projections for long-term availability of dwarf mistletoe infected trees with large brooms, and subsequent protection and/or promotion of such features, should guide decision-making.

Treating Activity Fuels

The type of prescribed fire application is a function of road access. There are approximately 39 miles of road in the Ashland watershed. Areas within 1,000 feet of a road (downhill side) and with a consistent aspect are candidates for broadcast underburning. This is estimated at approximately 4,700 acres. Site conditions may permit underburning on units further than 1,000 feet from roads. Areas without road access should have activity fuels less than 6 inches in diameter hand piled and the piles burned. The actual extent of broadcast burning as a tool to treat activity fuels will be determined at the implementation phase of the project. Conditions may permit underburning on units further than 1,000 feet from roads. Areas without road access should have activity fuels less than 6 inches in diameter hand piled and the piles burned. The actual extent of broadcast burning as a tool to treat activity fuels will be determined at the implementation phase of the project.

Hand-piling slash (material greater than 1 inch) can occur, consistent with the general prescriptions for soil conservation, and to the extent that piles do not exceed 5 to 20 percent of the area (Appendix 8.1). This may require hand piling and burning to take place in more than one season or piles fed from adjacent piles during active burning. The objective here is to limit the area where soil humus and duff are removed, a key to maintaining soil productivity and surface stability.

Riparian Areas

Default widths established by the Northwest Forest Plan delineated Riparian Reserves that in some places are wider and in others narrower than the area that ecologically functions as a riparian area. As a consequence, during implementation we propose that the riparian area delineation be tailored to reflect site-specific characteristics throughout the watershed. In general, these riparian areas and an additional 50-foot buffer will not be treated. Above the no treatment zone in areas identified as priorities for fuel reduction, treatments gradually will increase in intensity so that they will receive the same treatments as northerly aspects for that PAG.

Within the riparian areas, restoration treatments will occur only where past timber harvest and management activities (including establishment of plantations) have encroached into the riparian area and natural recovery is not occurring. Such treatments will address problems associated with the past timber harvest. In such circumstances, recruitment of large woody debris may have been impaired and therefore, likely will need to be supplemented.

Inventoried Roadless Area

Management in the McDonald Peak Inventoried Roadless Area will be limited to prescribed fire and hand work on small diameter understory fuels and vegetation under 7 inches DBH.

Large Tree Retention

This prescription is designed to promote and maximize retention of Cohort 1 and larger cohort 2 trees throughout the project area. This project proposes to reduce fuels and the density of the smaller trees. Cohorts 2 and 3 would be thinned from below to establish desired more open forest structure and, to the extent possible, the largest trees of all species in the stand would be retained. Specific justification will be required for felling and/or removal of trees in cohorts 1 and 2. Justification protocols are discussed below.

Around Cohort 1 trees, stand density reduction will be employed in priority areas identified for treatment to improve vigor, reduce susceptibility to attack from bark beetles and/or disease, and reduce the potential for damage from wildfire and/or prescribed fire - that is, to maximize their potential for long-term retention. Stand density reduction should focus on smaller Cohort 2 and 3 trees first within the immediate vicinity of the retained Cohort 1 tree and out to a radius equal to 2 crown radii. Complete tree and/or vegetation removal within this crown radii is not the intention; rather, an overall reduction in stand basal area not to exceed 50 percent of existing basal areas, or a specified basal area target (100 square feet per acre in Ponderosa Pine and Douglas-fir PAGs; 150 square feet per acre in White Fir PAGs), whichever is greater. **Basal area targets in all PAGs are intended as guides to facilitate site-specific evaluations. Where management is necessary, thinning will start first with the smallest trees on the site. Conversely, the largest trees on the site will be reserved first. Trees identified for thinning will be used to satisfy snag and down wood targets (largest first).** Density and spacing of trees left after stand density reduction can be ordered, clumped, or variable, ideally with vegetation and tree felling and removal greatest in downhill directions (or in the direction of expected spread in a wildfire event). Ladder fuels within the crown radius of the preferred Cohort 1 tree are also a priority for removal. In the treatment area around the preferred Cohort 1 tree, retention of the most vigorous Cohort 1 or 2 trees is desired to reach target basal areas, with pines and hardwoods particularly preferred.

100 Feet of Basal Area

Tree Diameter in Inches	Feet of Basal Area / Tree	Number of Trees / 100 Feet Basal Area
20	2.2	45
30	4.9	20
40	8.7	11
50	13.6	7
60	19.6	5

150 Feet of Basal Area

Tree Diameter in Inches	Feet of Basal Area / Tree	Number of Trees / 150 Feet Basal Area
20	2.2	68
30	4.9	30
40	8.7	17
50	13.6	11
60	19.6	7

In stands within priority areas identified for treatment where greater than 50% of basal area is in trees between 25 to 50+ inches (cohort 1) there has to be site specific rationale for cutting trees or creating snags with trees over 25 inches. Cutting means trees are left on site to satisfy habitat or soil objectives. Once density targets, snag recruitment, down wood, and soil management objectives are satisfied, felled trees are considered available for removal. A transparent validation process with integral involvement by City designated representatives is required for removal of trees over 25 inches DBH.

In stands where greater than 50% of BA is in trees 10-25 inches DBH (cohort 2 dominated) there has to be site-specific rationale for cutting and then removing (defined above) site trees over 17 inches, or creating snags, when all objectives are met. The transparent validation process discussed above, with integral involvement by City designated representatives, is required for cutting and removal of trees.

The technical team agreed in principle that certain rationales, such as meeting pine retention prescriptions, could justify felling of some larger trees. However, the team has not discussed specific rationale that might justify removal of such trees.

***It is very important that the Technical Team or other designated representatives of the City of Ashland and the community be involved during the verification process to ensure that the intent of these prescriptions are faithfully implemented on the ground.*

Prescriptions by Plant Association Group

This plan considers the Plant Association Group the key determiner of the proposed prescription and prescriptions are therefore described by PAG. The implementation of prescriptions across treatment setting types (Category/priority) must identify and map the PAG, because the treatment setting types contain a mix of plant association groups in most cases. The general guidelines provided here are meant to apply in most situations where we propose treatment. Stand level inventory should be used to develop site specific prescriptions during the implementation phase. Individual site differences may suggest slight prescription changes to more accurately reflect the inherent heterogeneity of site conditions within and among the treatment units arrayed across the watershed.

Oregon White Oak PAG

Oregon white oak - Hedgehog dogtail plant association

This plant association may be in a resilient condition that represents Category 1, but most stands within those priority areas of the watershed identified for treatment occur as inclusions within the Dry Douglas-fir PAG, and most likely will need to be treated.

Reduce the density of conifers and other vegetation around reserve pine and hardwood species. There will be cases where trees of the same species are growing closely together and functioning as one tree. Where this occurs the clump will be treated as a single tree and be a priority for retention.

During selection of trees to thin, reserve white oak and black oak greater than 6 inches DBH. Reserve madrone greater than 16 inches DBH. Reserve intermediate and overstory ponderosa pine with live crown ratios greater than 25 percent. Remove small diameter (7"DBH) Douglas fir and white fir within two crown radii of reserve trees. Keep the largest and most vigorous trees regardless of distribution.

> Exception 1: Some pines or large hardwoods with a live crown ratio less than 15 percent will have vegetation reduced within 2 crown radii. These trees are candidates for future snag recruitment if additional snags are perceived to be needed in the future.
>
> Exception 2: Douglas-fir greater than 16 inches DBH, representing individuals that may be part of Cohort 1 in this setting, with greater than a 40 percent live crown ratio will be retained.

Other vegetation greater than 1 inch in diameter at 1 foot above ground level will be cut (slashed). Shrub species and residual Douglas-fir will be slashed except as needed for soil cover and habitat considerations. Retain pine less than 7 inches dbh. To maintain structural, species, age class and habitat diversity, occasional untreated patches of various sizes up to 5 percent of the area can be retained in those areas that do not compromise wildfire management goals and/or potential future application of prescribed fire. Spacing guidelines will be developed on a site specific basis at the time of implementation.

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

Treat existing fuels and activity fuels with a broadcast burn wherever possible. If a broadcast burn is not possible, hand pile and burn. In broadcast burn areas, use ignition pattern that reduces flame intensity near smaller hardwoods and pine. Do not hand pile (where possible) within 10 feet of retained hardwoods and pines.

Restore native grass component. Roemer's fescue, prairie junegrass, and California fescue recommended.

A second vegetation treatment may be needed within 5 years. To the extent possible, schedule prescribed fire to maintain fire resiliency.

Ponderosa Pine PAG

Ponderosa pine - Douglas-fir plant association

Desired relative density: 0.2 to 0.4

This plant association may be in a resilient condition that represents Category 1, but most stands within those priority areas of the watershed identified for treatment are in a Category 2 condition, with stands in selected treatment priority areas occurring as inclusions within the Dry Douglas-fir PAG. This PAG is a valuable part of the Category 2 priorities in our fuel discontinuity network. Maintenance of the veteran pine and opening and re-establishing horizontal discontinuity of tree crowns is desired.

Reserve white oak and black oak greater than 6 inches DBH. Reserve madrone greater than 16 inches dbh. Reserve intermediate and overstory pine species and incense cedar with live crown ratios greater than 25 percent. Remove small diameter (7"DBH) Douglas fir within two crown radii of reserve trees. Reduce the density of Douglas-fir within four crown radii of reserve conifers and four crown radii of reserve hardwoods, if this can be done without damaging the reserved tree. Trees in cohorts 3 and 2 will be prioritized for removal. Keep the largest and most vigorous trees regardless of distribution.

> Exception 1: Some pines or large hardwoods with a live crown ratio less than 15 percent will have Douglas-fir removed within 2 crown radii if a future need for snags is perceived.
>
> Exception 2: Douglas-fir with greater than 40 percent live crown ratio will be retained.

Thin "from below" to a relative density of 0.2-0.4 based on stand characteristics, soil cover and topography.

Slash shrub species and residual Douglas-fir except in those areas retained for habitat and soil considerations. Retain pine less than 7 inches dbh. To maintain structural, species, age class and habitat diversity, occasional untreated patches of various sizes up to 5 percent of the area can be retained in those areas that do not compromise wildfire management goals and/or successful application of prescribed fire. Spacing guidelines will be developed on a site-specific basis at the time of implementation.

Treat existing fuels and activity fuels with a broadcast burn wherever possible. If a broadcast burn is not possible, hand pile and burn. In broadcast burn areas, use ignition pattern that reduces flame intensity near smaller hardwoods and pine. Do not hand pile (where possible) within 10 feet of retained hardwoods and pines.

Restore native grass component. Roemer's fescue, prairie June junegrass, and California fescue recommended.

In areas where shrubs are not desired, a second vegetation treatment may be needed within 5 years. To the extent possible, schedule prescribed fire to maintain fire resiliency.

Dry Douglas-fir PAG

Douglas-fir-Incense cedar/Piper's Oregon grape plant association
Douglas-fir-Ponderosa Pine/Poison oak plant association
Douglas-fir/Dry shrub plant association

1. Southerly and Westerly Aspects

Desired relative density: 0.3 to 0.5

This PAG is an important part of our fuel discontinuity network, extensively represented in high priority treatment settings of Category 2 (priority 4). Maintenance of the reserve pine and Douglas-fir in these stands, and opening and re-establishing horizontal discontinuity of tree crowns is desired.

Reserve black oak greater than 6 inches DBH, and ponderosa and sugar pine, incense cedar with live crown ratios greater than 25 percent. Douglas-fir with crown ratios over 30 percent also are reserved. In priority areas selected for treatment, remove small diameter (7"DBH) Douglas fir within two crown radii of reserve trees. Reduce the density of Douglas-fir within three crown radii of reserve conifers and two crown radii of reserve hardwoods if this can be done without damaging the reserved tree. Target basal area around reserve trees is 100 sq. ft./acre. Trees in cohorts 3 and 2 will be prioritized for removal, as needed to meet this prescription. Keep the largest and most vigorous trees regardless of distribution.

> Exception 1: Some sugar pine, incense cedar, or large hardwoods with a live crown ratio less than 15 percent will have Douglas-fir and white fir removed within 1 crown radius if a future need for snags is perceived. These trees are candidates for future snag recruitment.
>
> Exception 2: Douglas-fir greater than 16 inches DBH, representing individuals that may be part of Cohort 1 in this setting, with greater than a 40 percent live crown ratio will be retained.

Thin "from below" to a relative density of 0.3-0.5 based on stand characteristics, soil cover and topography. When thinning Douglas-fir, thin from below. Spacing for leave trees will be the result of analysis of stand data collected in the field from individual units. Thin to retain the

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

largest trees and trees with the best live crown ratios that will most rapidly occupy the site, and trees growing in microsites that may confer a degree of protection from a ground fire. There will be cases where trees of the same species are growing closely together and functioning as one tree. Where this occurs the clump will be treated as a single tree and be a priority for retention. Clumping of leave trees is permitted as long as canopy closure exceeds 40 percent on south slopes.

Slash shrubs, white fir, and other residual conifers except in those areas retained for habitat and soil considerations. Retain unthinned patches (up to 5 percent of the area) in areas where they will not preclude meeting prescribed burning operations or in places where wildfire suppression objectives would be compromised. Recommended areas for shrub retention are areas that are to be handpiled and burned or the lower portion of broadcast burn areas.

2. Northerly Aspects

Desired relative density: 0.4 to 0.6

Thinning in stages may be particularly appropriate in priority areas selected for treatment with vegetation in this PAG... Dense stands that have good vertical discontinuity have wildfire management benefits if they can be retained without significant density and bark beetle mortality.

Hardwoods, pine and cedar will be treated as described above for southerly aspects. When thinning Douglas-fir, trees in cohorts 3 and 2 will be prioritized for removal, as needed to meet this prescription. Keep the largest and most vigorous trees regardless of distribution.

3. All Aspects

Retain pine less than 8 inches dbh. Slash other vegetation less than 7 inches dbh.

In priority areas selected for treatment, treat existing fuels and activity fuels with a broadcast burn wherever possible. If a broadcast burn is not possible, hand pile and burn. In broadcast burn areas, use ignition pattern that reduces flame intensity near smaller hardwoods and pine. Do not hand pile (where possible) within 10 feet of retained hardwoods and pines.

Seed burnpiles and disturbed soil with native grasses. . California fescue and western fescue are recommended.

Moist Douglas-fir PAG

Douglas-fir-White fir plant association
Douglas-fir-white fir/Creeping snowberry plant association
Douglas-fir-Canyon live oak/Poison oak plant association

Plant associations in this PAG follow a moisture gradient from dry to moist and can be identified with a field inventory at implementation:

Douglas-fir-white fir/Creeping snowberry plant association

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

Douglas-fir-Canyon live oak/Poison oak plant association

Recommended treatments in priority areas selected for treatment are the same for this PAG as for the dry Douglas-fir PAG. Douglas-fir is a priority for retention over white fir.

Douglas-fir-White fir plant association

This plant association is characterized by a mix of species, including a low cover of white fir, often in a multi-layered canopy structure and a relatively dense shrub layer including high percent-cover of dwarf Oregon grape.

1. Southerly Aspects

Desired relative density: 0.3 to 0.5

Reserve hardwoods, except madrone, greater than 8 inches dbh. Madrone greater than 16 inches dbh is reserved. Overstory sugar pine, ponderosa pine, and incense cedar with live crown ratios greater than 25 percent also are reserved. In priority areas selected for treatment, remove small diameter (7"DBH) Douglas fir and white fir within two crown radii of reserve trees. Reduce the density of Douglas-fir and white fir within two crown radii to 100 sq. ft./acre basal area if this can be done without damaging the reserved tree. Trees in cohorts 3 and 2 will be prioritized for removal, as needed to meet this prescription. Keep the largest and most vigorous trees regardless of distribution.

> Exception 1: Some pines or large hardwoods with a live crown ratio less than 15 percent will have Douglas-fir and white fir removed within 1 crown radius. These trees are candidates for future snag recruitment if additional snags are perceived to be needed in the future.
>
> Exception 2: Douglas-fir greater than 16 inches DBH, representing individuals that may be part of Cohort 1 in this setting, with greater than a 40 percent live crown ratio will be retained.

Thin "from below" to a relative density of 0.3-0.5 based on stand characteristics, soil cover and topography.

Slash shrubs, white fir, and other residual conifers except in those areas retained for habitat and soil considerations. Retain unthinned patches (up to 5 percent of the area) in areas where they will not preclude meeting prescribed burning operations or in places where wildfire suppression objectives would be compromised. Recommended areas for shrub retention are areas that are to be handpiled and burned or the lower portion of broadcast burn areas.

2. Northerly aspects

Desired relative density: 0.4 to 0.6

Hardwoods, pine and cedar in priority areas selected for treatment will be treated as described above for southerly aspects. When thinning Douglas-fir or white fir, trees in cohort 3 and 2 will

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

be prioritized for removal, as needed to meet this prescription. Keep the largest and most vigorous trees regardless of distribution.

3. All Aspects

Retain pine less than 8 inches dbh. Retain madrone greater than 16 inches dbh. In priority areas selected for treatment, slash other vegetation less than 7 inches dbh. Treat existing fuels and activity fuels with a broadcast burn wherever possible. If a broadcast burn is not possible, hand pile and burn. In broadcast burn areas, use ignition pattern that reduces flame intensity near smaller hardwoods and pine. Do not hand pile (where possible) within 10 feet of retained hardwoods and pines.

Dry White fir PAG

White fir-Douglas-fir/Baldhip rose plant association
White fir/Creeping snowberry plant association

This plant association can be identified by the presence of large overstory pine and Douglas-fir, and golden chinquapin as an understory tree. Forests in this plant association have a higher potential than warmer and dryer PAGs to support habitat for late-successional dependent species such as the spotted owl and retain this habitat over time. These forests were also more likely to experience patches of high severity fire events.

In priority areas selected for treatment, manage for higher site occupancy by Douglas-fir compared with white fir unless precluded by mistletoe considerations.

Retention of large hardwoods other than chinquapin will become more difficult in higher elevations due to snow load.

1. Southerly Aspects

Desired relative density: 0.3 to 0.6 (0.3 in areas of higher wildfire management priority or to promote pines).

Reserve golden chinquapin greater than 8 inches dbh. Sugar pine, ponderosa pine, with live crown ratios greater than 25 percent also reserved. In priority areas selected for treatment, remove small diameter (<7" DBH) Douglas fir and white fir within 2 crown radii of reserve trees. Reduce Douglas-fir and white fir within two crown radii to a basal area density of 150 sq. ft./acre if this can be done without damaging the reserved tree. Trees in cohorts 3 and 2 will be prioritized for removal, as needed to meet this prescription. Keep the largest and most vigorous trees regardless of distribution.

> Exception 1: Some pines or large hardwoods with a live crown ratio less than 15 percent will have Douglas-fir and white fir removed within 1 crown radius. These trees are candidates for future snag recruitment if additional snags are perceived to be needed in the future.

Exception 2: Douglas-fir greater than 16 inches DBH, representing individuals that may be part of Cohort 1 in this setting, with greater than a 40 percent live crown ratio will be retained.

Thin "from below" to a relative density of 0.3-0.5 based on stand characteristics, soil cover and topography.

Slash shrubs, white fir, and other residual conifers except in those areas retained for habitat considerations. Retain unthinned patches (up to 5 percent of the area) in areas where they will not preclude meeting prescribed burning operations or in places where wildfire suppression objectives would be compromised. Recommended areas for shrub retention are areas that are to be handpiled and burned or the lower portion of broadcast burn areas.

2. Northerly Aspects

Desired relative density: 0.4 to 0.6

Hardwoods, pine and cedar will be treated as described above for southerly aspects. When thinning Douglas-fir or white fir in those priority areas identified for treatment, trees in cohort 3 and 2 will be prioritized for removal, as needed to meet this prescription. Keep the largest and most vigorous trees regardless of distribution.

3. All Aspects

Retain pine less than 8 inches dbh. Retain madrone greater than 16 inches dbh. In priority areas identified for treatment, slash other vegetation less than 7 inches dbh. Broadcast burn wherever possible. If a broadcast burn is not possible, hand pile and burn. In broadcast burn areas, do not light near smaller hardwoods hardwoods and pine. Do not hand pile (where possible) within 10 feet of retained hardwoods and pines.

Moist White fir PAG

White fir-Incense cedar/Western starflower plant association
White fir/Dwarf Oregon grape plant association
White fir/Dwarf Oregon grape/Western twinflower plant association

These forests were more likely to experience at least patches of high severity fire events. Forests in this PAG have the potential to support habitat for late-successional dependent species such as the spotted owl and retain this habitat over time. Forests in this PAG also have the potential for a high severity fire event.

Retention of large hardwoods other than chinquapin will become more difficult in higher elevations due to snow load.

1. Southerly Aspects

Desired relative density 0.3 to 0.6

Reserve black oak and white oak greater than 8 inches DBH and sugar pine and incense cedar with live crown ratios greater than 25 percent. In priority areas identified for treatment, remove small diameter (<7" DBH) Douglas fir and white fir within 2 crown radii of these trees. Reduce Douglas-fir and white fir within 2 crown radii to a basal area density of 150 sq. ft./acre if it can be done without damaging the retention tree. Trees in cohorts 3 and 2 will be prioritized for removal, as needed to meet this prescription. Keep the largest and most vigorous trees regardless of distribution.

> Exception 1: Some sugar pine, incense cedar, or large hardwoods with a live crown ratio less than 15 percent will have Douglas-fir and white fir removed within 1 crown radius. These trees are candidates for future snag recruitment if additional snags are perceived to be needed in the future.
>
> Exception 2: Douglas-fir greater than 16 inches DBH, representing individuals that may be part of Cohort 1 in this setting, with greater than a 40 percent live crown ratio will be retained.

2. Northerly Aspects

Treatments are not being proposed for this landscape setting.

3. All Aspects In priority areas identified for treatment, retain uncut patches of shrubs (up to 5 percent of the area) where they will not preclude meeting prescribed burning operations or in places where wildfire suppression objectives would be compromised. Pacific yew is reserved. Areas containing Pacific yew and Pacific dogwood are candidates for no treatment. Areas that are to be handpiled and burned would be favored for shrub retention or the lower portion of broadcast burn areas.

Retain incense cedar and pine less than 8 inches dbh. Slash other vegetation less than 7 inches dbh. In broadcast burn areas, do not light near smaller hardwoods and pine. Do not hand pile or light near Pacific yew. Do not hand pile (where possible) within 10 feet of retained hardwoods and pines. Broadcast burn where road access permits, otherwise hand pile and burn the piles.

Cool White Fir PAG

White fir-Shasta red fir/Common prince's pine-Threeleaf anemone plant association

Desired relative density: 0.4 to 0.7

This plant association can be characterized by the beginning emergence of Shasta Red Fir as an integral part of existing stands, particularly as an overstory species. Shasta Red Fir is more tolerant of frequent, low-to-moderate intensity fire than its primary vegetation associate in this PAG, white fir, due to characteristics such as thicker bark, elevated foliage, large size, greater longevity and increased resistance to root disease common in these plant associations.

The absence of fire has compromised the long term viability of some large overstory Shasta Red Fir and occasional large sugar and ponderosa pines that occur on upper south and west slopes. Plot data suggests that over twice as many trees per acre (largely white fir) occur in this PAG as in any other PAGs in the project area. Retention of large hardwoods other than chinquapin will become more difficult in higher elevations due to snow load. South and west aspects and ridgelines in this PAG, designated priority 6 in the treatment grid, are the highest priority for treatment. Northerly aspects in this PAG will not be treated.

1. All Aspects

Reserve golden chinquapin greater than 8 inches dbh and Shasta red fir and pine with live crown ratios greater than 25 percent. In priority areas identified for treatment, reduce Douglas-fir and white fir within 2 crown radii of these trees to a basal area density of 150 sq. ft./acre if this can be accomplished without damaging the retention tree. Trees in cohorts 3 and 2 will be prioritized for removal, as needed to meet this prescription.
Spacing for thinning will be determined on a site-specific basis at the time of implementation. Shasta red fir, pines and Douglas-fir are priorities for retention over white fir. Keep the largest and most vigorous trees regardless of distribution.

> Exception 1: Some sugar pine, incense cedar, or large hardwoods with a live crown ratio less than 15 percent will have Douglas-fir and white fir removed within 1 crown radius. These trees are candidates for future snag recruitment if additional snags are perceived to be needed in the future.
>
> Exception 2: Douglas-fir greater than 16 inches DBH, representing individuals that may be part of Cohort 1 in this setting, with greater than a 40 percent live crown ratio will be retained.

Thin "from below" to a relative density of 0.4-0.7 based on stand characteristics, soil cover and topography. Understory thinning should be heaviest on the downhill side of preferred overstory Shasta red fir and pines in order to minimize impacts during a wildfire event. Retain uncut patches of shrubs (up to 5 percent of the area) where they will not preclude meeting prescribed burning operations or in places where wildfire suppression objectives would be compromised. Pacific yew is reserved. Areas containing Pacific yew and Pacific dogwood are candidates for no treatment. Areas that are to be handpiled and burned would be favored for shrub retention or the lower portion of broadcast burn areas.

Retain Shasta red fir, incense cedar, and pine less than 8 inches dbh. Slash other vegetation less than 7 inches dbh. In broadcast burn areas, do not light near smaller hardwoods and pine. Do not hand pile or light near Pacific yew. Do not hand pile (where possible) within 10 feet of retained hardwoods and pines. Broadcast burn where road access permits, otherwise hand pile and burn the piles.

Small Diameter Thinning and Surface Fuels Reduction

Previously Harvested Areas (Clearcuts and plantations)

Plantations, priority 3 among the treatment settings, were considered strategic areas to thin within Category 3. Individual project areas should be subdivided into four units, each representing a variation in spacing: 30 percent regular spacing, 30 percent wide spacing, 30 percent variable spacing, and 10 percent no treatment. Each will have to be flagged on the ground.

Regular spacing will thin conifers on a 15-foot by 15-foot spacing and hardwoods on a 20-foot by 20-foot spacing. Criteria for hardwood spacing will be as follows:

Sprouting hardwood stumps with more than 3 sprouts shall be cut back to three sprouts. Criteria for selecting which 3 sprouts to leave shall be prioritized as follows:

1. Largest diameters at 2 feet above ground level.
2. Best-formed, straightest, and with the best developed crowns.
3. Originates closest to ground level.

Wide spacing will thin conifers on 30 by 30 foot spacing and hardwoods on 40 by 40 foot spacing. Wide spacings ideally should be placed on the gentler/ more stable slope locations.
Other treatments will be as listed for regular spacing. Hand pile and burn all activity fuels.

Any vigorous pine (ponderosa or sugar) or hardwoods greater than 12 inches dbh will have all vegetation within their drip lines slashed. Vigorous pine is defined as pine with at least 30 percent live crown ratio. Vigorous hardwoods are those with a minimum of 25 percent live crown ratio.

All other vegetation greater than 1 inch in diameter at 1 foot above ground level will be slashed, piled, and the piles burned.

<u>Understory Treatments (partial cut areas, including shaded fuel breaks)</u>

Understory cohorts in previously logged areas will be retained where they occur as a result of a canopy gap. Treatments will be the same as listed for young stand management. Where understory cohorts are not associated with a canopy gap, ladder fuels will be removed over time and burned as per soils recommendations. Many of these areas currently have wildfire management benefits and are listed as high priority for treatment. To the extent possible, schedule prescribed fire to maintain fire resiliency.

Specific Management Recommendations

Either trees to be removed or trees to be taken will be marked on the ground.

The no-treatment areas in the Riparian Reserve will be flagged, posted, and painted.

Preferred retain trees of any species, are reserved contractually. A damage clause for these trees should be made part of the timber sale contract.

The Ashland Watershed Protection Project should be completed prior to initiation of activities under this proposal.

Monitoring

We feel that monitoring is of the utmost importance. Adaptive management is the only strategy that makes sense for this watershed.

Some preliminary thoughts on monitoring are included as Appendix 8.4. Much more effort will be incorporated into the monitoring plan, and a final plan will be developed over the next few months.

References

Amaranthus, Michael P., Raymond M. Rice, Nicholas R. Barr, and Robert Ziemer, 1985. Logging and Forest Roads Related to Increased Debris Slides in Southwest Oregon, Journal of Forestry, April 1985 pages 229-233.

Ashland Forest Lands Commission 2003, City Forest Lands Restoration Project Phase II, 36 p.

Ashland Watershed Stewardship Alliance 1999. Draft Comment and Proposal for the Ashland Watershed Protection Project, 114p.

Lindenmayer, D.B. and J.F. Franklin. 2002. *Conserving Forest Biodiversity: A Comprehensive Multiscale Approach*. Island Press. Washington, D.C.

McDonald, Philip M. 1990. California Black Oak: in Silvics of North America. Volume 2 Hardwoods. Agriculture Handbook 654 Washington DC: U.S. Department of Agriculture. Pages 661 -671.

Rothermel, R.C. 1983. *How to Predict the Spread and Intensity of Forest and Range Fires*. USDA For. Serv. Gen. Tech. Rep. INT-143. Ogden, UT.

USDA Forest Service. 1996. *Mount Ashland Late-Successional Reserve Assessment*. Rogue River and Klamath National Forests. Medford, OR, and Yreka, CA.

Appendix 8.1

CITY OF ASHLAND

April 30, 2004

Linda Duffy, District Ranger
Ashland Ranger District
645 Washington Street
Ashland, Oregon 97520

RE: Scoping comments for Ashland Forest Resiliency Project with a recommended Community "Third" Alternative, and Phase I Ashland Community Wildfire Protection Plan

Dear Ms. Duffy:

The Ashland Forest Lands Commission and the undersigned organizations and individuals submit the following scoping comments for the Rogue River-Siskiyou National Forest's proposed *Environmental Impact Statement for the Ashland Forest Resiliency Project (AFR)*. As part of our comments, we offer an alternative that we urge you to accept for consideration and analysis as a third alternative.

Each of us are vitally interested in land management decisions on National Forest System lands administered by the Forest Service, particularly those located within the Upper Bear Assessment area. We are pleased that the agency has decided to prepare an Environmental Impact Statement rather than relying on an Environmental Assessment on this proposed action. We concur with the Forest Service's determination that both the scale and scope of the potential impacts of this proposal constitute a major federal action that is likely to significantly affect the quality of the human environment.

The City of Ashland would like to be more closely involved in the planning, decision making and implementation of management activities in the Ashland Watershed. The City has clearly shown its ability to act collaboratively and produce sound professional outcomes on the ground. Our recent experience with the City Forest Lands Restoration Project - Phase 2 produced a project that is both ecologically sound and economically efficient. The City has a long history of committed public involvement in forest land issues and this is reflected in the significant professional expertise within its paid staff, volunteers, and committed citizens. A revitalized arrangement between the City and the Forest Service is needed that integrates this reality in a way that can improve forest management in the watershed, build social capital, foster a sense of responsibility and ownership within the community, and enhance workable connections with a sometimes distant federal land manager.

Fuel reduction considerations in the Ashland Watershed must address many interrelated issues. The naturally high levels of variation in forest conditions, the elevated and reduced fire hazard due to successional dynamics and past management actions, increased ignition sources, critical wildlife habitats and other biodiversity considerations, the imperative to protect water quality, and the uncertain effects of various management actions are all important. In recognition of these entwined factors, we believe the conceptual alternative outlined below offers a scientifically sound basis for meeting the AFR purpose and need.

Our recommended "third" alternative was developed in a collaborative process involving the Ashland Forest Lands Commission, City of Ashland, Headwaters, Klamath-Siskiyou Wildland Center, Ashland Watershed Stewardship Alliance, World Wildlife Fund, as well as independent local consultants. We drew upon the understanding developed during past community collaborations.

This proposal meets the stated Purpose and Need of the Ashland Forest Resiliency Project. The stated **Need** is “for urgent reduction of large-scale, high intensity wildland fire in the Upper Bear Analysis Area.” The stated **Purpose** “…is to protect values at risk, reduce crown fire potential and obtain conditions that are more resilient to wildland fires.”

This proposal meets the Purpose and Need by creation of more open stand structure and reduction in vertical continuity (i.e. ladder fuels) in areas most appropriate (based on plant associations) for this type of treatment. It proposes stand density reduction to create a more fire resilient landscape while maintaining a high level of structural heterogeneity across the landscape.

Our proposal offers a different approach to restoring fire in the project area - the establishment of fire resistant patches to restore landscape-scale resiliency. Implementation of our recommended management approach would result in an immediate reduction in the risk of large-scale, high intensity wildland fire in the project area. Our proposal tackles head-on the landscape homogenization of fuels that has resulted from past management activities. Its underlying design concept is restoration of heterogeneity in the watershed.

We propose to reestablish landscape-scale habitat patchiness through a "fuel discontinuity network” (FDN), rather than creation of swaths that pass through a mix of stand conditions and plant associations (i.e., DFPZs). We believe this strategy will offer significantly more positive ecological benefits than would the proposal outlined in your scoping notice. The estimated acreage and locations to be treated pursuant to our proposal easily can be approximated with access to Forest Service proprietary GIS data (see attachment A). However, a complete spatially explicit inventory, as discussed below, will be necessary for development of an implementation plan.

The legal time constraints imposed by the current process, while well-intentioned, have made the proper compilation of this community proposal a challenge. Even though there may be an element or two that is deficient, there has been an outstanding level of good science and dutiful hard work by some very able members of our community. We would hope that this unprecedented collaboration would not be negated by some minor process requirement.

Recommendation for a Third Alternative

I. Complete a spatially explicit inventory of vegetation and soil conditions in the Ashland Watershed

First and foremost, ecologically sound planning in the Ashland Watershed requires a much better site-specific inventory of vegetation, potential fuels, and soil conditions than currently is available. We believe a spatially explicit inventory must be conducted before an informed proposal can be placed on the ground. It is not necessary to do an intensive inventory with fixed plots. Air photo interpretation can identify similar stand types and a walk-through inventory with trained personnel would be sufficient for characterizing each polygon. Critical data to be collected include plant association, stand structure, relative density, species composition by canopy class, basal area, shrub and herbaceous cover, as well as anthropogenic ignition sources (such as roads, homes, trails, campgrounds, etc).

Completion of this inventory need not preclude timely implementation of this project. A preliminary time estimate for this work is roughly 140 field day equivalents and another 70 day equivalents for analysis and development of GIS layers. This equates to approximately 12 work months. A crew of four qualified individuals could accomplish the fieldwork this summer (June, July, and August), complete the office work by the end of October, and the detailed design for on-the-ground treatments could be completed by the end of this year. Implementation could begin in early 2005. Ground truthing is essential for this project. Data obtained from satellite imagery and aerial photos are not sufficiently accurate, unless coupled with a walk-through inventory.

II. Focus inventory and treatment on the dry plant associations (ponderosa pine, dry Douglas fir, and dry white fir series)

The Ashland watershed includes a diverse array of vegetation types and stand conditions. Some areas currently are outside the natural range of variability in terms of fuel loadings, stand structures and other forest attributes, whereas others have changed relatively little. However, fire regimes in the region have not been shown to have a central tendency, so condition class concepts are questionable. In general, the drier plant associations - those in the ponderosa pine and dry Douglas-fir series - should be the first priority for inventory and treatment. These sites are most at risk from high severity fire, and therefore are the highest priority for strategic fuels reduction work.

Inventory and analysis described in item I (above) also should cover the more productive moist plant associations (white fir series) located at middle elevations (approximately 3,000 to 5,000 feet elevation). While treatment priorities should be heavily weighted toward areas within dry plant associations, particular circumstances may warrant immediate action in strategic locations in the moist forest types as well. For example, where remnant stands of large/old fire-resistant pines are found to be at high risk of loss to fire or insects, attempting to control these disturbances may become a high priority. Work may be necessary in moist plant associations determined to be outside natural variability range, however careful planning is critical and must recognize that mesic plant associations, naturally are dense and adapted to a different fire regime. Last, our proposal would focus work within the Ashland Municipal Watershed before moving into other areas covered in the 2003 Upper Bear Assessment. The Ashland Municipal Watershed is the priority.

III. Establish a Fuel Discontinuity Network (FDN)

While compartmentalization may be an appropriate conceptual approach for fire hazard reduction in the Ashland Watershed, we believe it should be based to the greatest extent possible on natural landscape and vegetative features rather than artificially engineered linear swaths that pass through a mix of stand conditions and plant associations. This approach would take advantage of the existing heterogeneity in the watershed, and where necessary, create additional discontinuity in fuels (both horizontally and vertically) to establish a fuel discontinuity network (FDN) and thereby reduce landscape-scale fire hazard. Such an approach would achieve variability in fuel density across the landscape while treating the least number of acres necessary in order to address the purpose and need effectively. In establishing the FDN, we propose a design using the following principles:

1. Identify and use all features that currently have lower potential for crown fire as the initial starting or anchor points for compartmentalizing fuels in the watershed. This may include natural openings, meadows, relatively open ridgetops, moist riparian areas, and areas where management has temporarily reduced crown fire potential. These areas would serve as the cornerstone for re-establishing more landscape-level patchiness in fuels and vegetation conditions, assuming adequate maintenance occurs.

2. Identify and implement fuel reduction treatments in those areas where relatively little resource investment may be able to create relatively fire-resistant stand conditions. This may include low-productivity sites with relatively little encroachment of small trees, dry plant associations on south and west aspects, open stands dominated by large conifers or hardwoods. Targeting initial work, as needed, in these areas will maximize the area to be treated with available funds and personnel, and thereby provide the greatest opportunity to quickly reduce fuels and restore ecosystem function at larger spatial scales.

3. Identify and implement treatments in those areas that occupy a strategic geographic position in the landscape relative to #1 and #2 sites, and/or are in close proximity to areas of high resource value that are at high risk of loss due to disturbance processes (e.g., sensitive species locations, key wildlife habitats, areas determined by risk assessment to have high ignition potential, etc.) Strategic selection of these areas to include in the fire-resistant network of patches is based on their ability to disproportionately influence wildfire spread or the risk of losing key resource values to fire or other disturbance. Included in these areas are excessively dense stands that are at high risk of insect-related mortality. Density reduction through thinning of intermediate and suppressed trees that act as ladder fuels can build stand resistance while increasing vertical discontinuity of fuels.

The outcome of strategically prioritizing fuel reduction work in these areas would be a network of fire-resistant patches in dry and moist plant associations that provide fuel discontinuities across the project area, thereby reducing the landscape risk of crown fire without imposing undue risk to currently important habitats and remaining high-integrity areas.

IV. Where landscape-scale fuel reduction is determined to be most strategic (i.e., those sites identified pursuant to III, above), plan treatments that recognize and foster natural variability, pose the least risk to resource values and facilitate the restoration of fire as a key ecosystem process.

Both thinning and prescribed fire are potentially legitimate tools for fuels reduction - each has its own set of risks, limitations, and benefits. While thinning may be successfully used to reduce potential fire hazard at the stand level, it cannot replicate many of the important ecological effects of fire. Where it can be employed with acceptable levels of risk, prescribed fire should be considered the preferred tool in creating more fire-resilient stand conditions. Furthermore, fire prescriptions should be designed to maximize ecological benefits and should be sensitive to soils resources (e.g., broadcast burning over approaches that concentrate effects on soils, and fall burning to reduce the impact on ground layer species critical to soil retention). Careful use of seasonal opportunities during which weather conditions precludes the possibility of crown fire can expand the options for use of fire as a primary treatment. However, we believe that many areas will need thinning or other fuel treatment before fire safely can be introduced. Once some fuels reduction further reduces the risk of crown fire, then prescribed fire should be used to maintain more fire-resilient conditions across the landscape.

Decisions about the use of mechanical treatments must be based on site-specific conditions and weighed against the potential for short-term impacts and the long-term likelihood of accomplishing overall objectives. It is clear, however, that mechanical treatments will be most appropriate in areas where: 1) reintroduction of fire is infeasible or likely to be detrimental, and 2) the risks of adverse environmental impacts associated with mechanical treatment are relatively low. Within these areas, we suggest the following as a basis for this alternative:

- Focus on removal of small, suppressed and intermediate trees, particularly of shade tolerant species that have become more abundant as a result of fire suppression and past logging. Tree removal should be based on the twin goals of reducing the likelihood of crown fires and opening prescription windows such that fire subsequently can be more safely applied.

- Protect large and old trees. This could be achieved by managing for higher stand occupancy by pine species, hardwoods and large Douglas-fir. These important legacies are disappearing rapidly from the landscape and are biologically valuable from a variety of perspectives. Stand density reduction with subsequent slash treatment around healthy large pines should be a high priority, particularly below 5000 feet elevation.

- In those areas where thinning or other fuels reduction (e.g., broadcast burning, chipping, pile burning) are desired, create more open stand structures in those forest types and topographic settings where such conditions would be expected under a natural disturbance regime (e.g., dry plant associations on south and west aspects, upper third slope positions and other low productivity sites) so as to contribute to the landscape-scale restoration of habitat heterogeneity in the watershed.

- Vertical discontinuity should be encouraged through light thinning-from-below of intermediate and suppressed trees. To maximize effects on reducing crown fire potential, understory treatment should focus on reducing high rates of surface heating.

- Manage for naturally high levels of heterogeneity by tailoring prescriptions to different plant associations. Tree density, species composition and other key attributes range widely between different forest types and even within associations. This natural variation should be recognized and incorporated into development of prescriptions. ***No single prescription or treatment should be applied widely in a uniform fashion.***

- Snag and down log numbers need additional analysis. The current proposal says the Forest Plan will be followed. The Northwest Forest Plan objectives for the Klamath Province still officially are set at 120 feet of down wood per acre, everywhere, all the time. Snag and down log numbers are not constant across plant communities; rather, they are a function of site productivity and the disturbance regime. They are different in different plant series. The target numbers must reflect this ecological reality, the needs of specific indicator species, and the important contribution made by coarse woody material to maintenance of soil stability.

- Balance the goal of more open forest structures with the protection of existing late-seral forests. For example, late-seral stands in the drier plant associations most likely will not have high canopy closures as they will be dominated by pine and hardwoods. Whereas, forests in more productive plant associations will have high canopy closures.

- Reduce fuels generated as a result of mechanical treatments. Surface fuels should be reduced with prescribed fire, pile burning, and chipping rather than machine crushing or piling (which are more likely to result in adverse effects).

- Protect and enhance soil resources by employing low-impact silvicultural systems. Standards should be implemented that avoid compaction, and maintain soil cover and organics through the use of down logs. Prevent invasion of exotic species by ensuring equipment does not introduce seed to the site. Achieving these goals should be given serious consideration as a core part of the planning of treatments.

- Protect ecologically sensitive areas, including areas with highly erosive or unstable soils, steep slopes, riparian areas and rare/unique communities. These sites are more likely to be adversely affected by mechanical treatments and often are local hotspots for biodiversity.

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

V. Incorporate research and monitoring as essential components of this alternative.

There are substantial areas of uncertainty - both in theory and practice - surrounding the restoration of fire-adapted ecosystems and reduction in crown fire potential. We have a great deal to learn about the ecological effects of various restoration treatments and how they can be most effectively implemented to produce desired outcomes. Thus, well-designed multiparty monitoring programs [pursuant to HFRA section 102(g)(5)] should be built into this proposal so that we can learn as we go. Quantitative monitoring should be ongoing to assess project layout and implementation and evaluate treatment effects across a variety of different stand types (similar to how the City has discussed "landscape units" in its planning).

While much can be gained from a well-designed program of monitoring, some basic research also is critically important. Research programs should be developed to study the effectiveness of fuels reduction treatments. Where possible, projects should be designed as experiments with replicates and controls to test alternative hypotheses. New understanding resulting from these efforts should then be used to adjust subsequent restoration activities, enabling an adaptive management approach. Our proposal would take advantage of the Ashland Research Natural Area as an excellent opportunity to monitor experimental and ecologically sensitive forest management strategies designed to restore more fire resistance and resiliency. To maximize the opportunities for such research it may be necessary to update the RNA plan.

In addition, it is critical that the Forest Service elevate priority for action in this project to the highest level. This means is it critical that the project receive priority in terms of funding not only for implementation, but also for the inventory, research and monitoring necessary to ensure that the implementation plan effectively provides for ecologically sound, rapid action to restore fire resiliency to the watershed.

Relationship to Community Wildfire Protection Plan

With passage of the Healthy Forest Restoration Act, there is guidance from Congress to local communities regarding development of a Community Wildfire Protection Plan (CWPP). The community of Ashland has been working collaboratively for years to develop community consensus on fuel hazard reduction in the Ashland Watershed.

The City of Ashland's commitment to forest health and wildfire safety is well documented. Since 1994, the City's Water Fund has been used to pay for fuels reduction on 600 acres of municipal watershed lands. Please see the timeline within our Phase I Ashland CWPP (attachment B) to review the history of wildfire management and collaboration amongst the community and agencies.

Most recently, in 2002, the City contracted out and received a wildfire hazard analysis for over 2,600 private and municipal acres of wildland urban interface. This report and map have been used to conduct an extensive fuels reduction program. To date Ashland has been awarded $542,000 of National Fire Plan grant funds through the Oregon Department of Forestry. In 2002, the City was awarded a two-year grant from Jackson County of Secure Rural Schools and Community Self Determination Act Title III funds. Using this award, a Forest Work Grant Coordinator position is operated through Ashland Fire and Rescue and tasked with grant coordination, fuels reduction, and community fire planning. The Coordinator implements the priorities established in the Interface Management Plan, oversees grant administration and fundraising, and conducts homeowner education in the wildland-urban interface. Over 150 acres across 133 properties have been treated inside the city limits with the cooperation of local residents, Ashland Parks Department, and the City.

The Ashland Watershed Stewardship Alliance, a group of community stakeholders, formed during the NEPA process for the Forest Service's Ashland Watershed Protection Project and provided the impetus for the establishment of a City-sponsored Interagency Watershed Coordinator's Group in 2001. This group meets at least quarterly for the purpose of communication and coordination of management efforts and long-term fire planning for the entire watershed.

Given the Forest Service's action to place the Ashland Forest Resiliency project under HFRA and its requirement for a Community Wildfire Protection Plan (CWPP), the City of Ashland has taken steps to combine our work and modify format to ensure compliance with CWPP structure. The Phase I Ashland CWPP contains the documents and work produced collaboratively in Ashland primarily addressing private and municipal ownership in the Wildland-Urban Interface. The City used the work of the California Fire Safe Council, regional planning efforts (Trinity County Fire Plan, Applegate Partnership) and the *Preparing a Community Wildfire Protection Plan Handbook* in creating the Phase I Ashland CWPP.

> Included in our Phase I Ashland CWPP is the alternative approach suggested herein for consideration as a "third" alternative in the Ashland Forest Resiliency Project (AFR) Draft Environmental Impact Statement. This element of our CWPP is essential to refining the definition of the Wildland-Urban Interface based on ecosystem characteristics and outlines our community's desired management strategy for federal lands in the AFR project area.

The Ashland Forest Lands Commission, working collaboratively with other entities in the community, anticipates finalization of the CWPP in July/August 2004. Formal approval of the Plan by the City of Ashland, Jackson County, Ashland Fire Department, and Oregon Department of Forestry will be sought in August. County level government is identified in HFRA as a key jurisdiction for community fire planning. We anticipate merging our efforts in Ashland with a future county-wide planning effort, however Jackson County is in the early stages of establishing the organizational infrastructure to formulate a county-wide CWPP. Therefore, the city and community of Ashland have sole responsibility for creation of the CWPP. Because the timeline for completion of our CWPP nearly mirrors the Forest Service timeline for the Ashland Forest Resiliency Project, it is our belief that any benefits to the community that would accrue to the City of Ashland for possessing a CWPP should be granted to our community.

We appreciate the opportunity to provide scoping comments on the Ashland Forest Resiliency Project. The Healthy Forest Restoration Act directs the agency to consider an additional alternative if it is proposed during scoping [section 104(c)(1)(C)(i)], meets the purpose and need [Pursuant to section 104(c)(1)(C)(ii), and if the proposed action does not implement the recommendations regarding general location and basic treatment methods contained in an "at risk" community's community wildfire protection plan. Our recommendation is being offered as part of scoping. We believe it meets the urgent need to reduce the risk of large-scale, high intensity wildland fires while protecting values at risk.

Finally, section 104(f) of the Healthy Forest Restoration Act encourages meaningful public participation and directs the agency to facilitate collaboration. This section of the law specifically mentions local governments, community-based groups, and other interested persons, among others. The group that developed our recommended alternative involved members of these entities. We hope that the Forest Service will allow fine-tuning work to continue on our proposal. The groups of individuals who collaborated on this proposal, including in particular the members of the Ashland Forest Lands Commission, are proud of the consensus we were able to develop and are available to provide further input to the Forest Service in the ensuing decision-making process.

Sincerely,

Stephen Jensen
Chair
Ashland Forestlands Commission

Cate Hartzell
City Councilor
City of Ashland

Signing on behalf of:

Frank Betlejewski
Richard Brock
JoAnne Eggers
Anthony Kerwin
Bill Robertson
Diane White
Members
Ashland Forest Land Commission

Keith Woodley
Fire Chief
Ashland Fire & Rescue

Cindy Deacon Williams
Conservation Director
Headwaters

Joseph Vaile
Campaign Coordinator
Klamath-Siskiyou Wildland Center
John DeVilbiss Ashland Watershed
Stewardship Alliance

Dominick DellaSala
Klamath-Siskiyou Regional Program Director
World Wildlife Fund

Attachment A. Mapping The Community Alternative

The following outline can be used to develop a spatial representation of this community alternative for analysis purposes. Of course, a fully detailed map cannot be rendered until after an accurate inventory of the watershed (Step 1 of this Alternative) is completed (as is also true of the Forest Service Proposed Alternative). The GIS layers needed are:

- Plant association (currently only a coarse “Plant Association Group” layer is available, so it will have to suffice)
- Digital Ortho Quads

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

- Aspect and Elevation
- Stand Structure
- Spotted Owl Core areas and habitat features
- Other Element Occurrences
- Geo Hazard Zones

1. Identify areas that currently have low potential for carrying fire. These become "anchor points" for the "Fuel Discontinuity Network".
2. Identify areas with naturally occurring low stand density where relatively little resource investment may be able to create relatively fire-resistant stand conditions. These will most likely be low-productivity sites, dry plant associations on south and west aspects, and open stands dominated by large conifers or hardwoods. These are priority fuel reduction treatment.
3. Stratify by PAG; White Oak, Dry Douglas-Fir, Ponderosa Pine and Dry White Fir form one strata; Moist Douglas-Fir, Moist White Fir form a second; Cool White Fir and Hemlock form a third strata. In the Community Alternative, as inventory is completed, plant associations would be used rather than the more coarse PAG's.
4. In the dry PAG on south and west aspects there is a high likelihood that stand density reduction would be warranted to create more open stand structures in those forest types where such conditions would be expected under a natural disturbance regime. Large pines (and other species) would be maintained through density reduction as well as excessively dense stands that are at high risk of insect-related mortality. In addition many of these areas occupy a strategic geographic position in the landscape relative to other nearby Fuel Discontinuity Zones. Stand density reduction with around healthy large pines should be a high priority below 5000 feet elevation.
5. In the dry PAG's on north and east aspects there is a moderate likelihood of stand density reduction being prescribed. Priority would be given to areas that 1) are in close proximity to areas of high resource value that are at high risk of loss due to disturbance processes or 2) have excessively dense stands that are at high risk of insect-related mortality, or 3) occupy a strategic geographic position in the landscape relative to other nearby Fuel Discontinuity Zones.
6. In the moist PAGS on all aspects there is a lower likelihood of stand density reduction being prescribed. Treatment would occur in areas similar to in 5.
7. In the high elevation PAG's very little stand density reduction would occur.

Appendix 8.2

REFERENCE CONDITIONS FROM THE OREGON AND CALIFORNIA REVESTMENT NOTES.

The attached table presents a summary of the data collected during inventories of railroad lands that would be revested to the United States. Summary descriptions of the conditions are offered below.

<u>Reference Condition In The Interface Forest (Circa 1920)</u>

Area inventoried total 1300 acres, including: 39S-1E-7 - 80 acres, 39S-1E-17 - 120 acres, 39S-1E-19 - 600 acres, 39S-1E-21 - 460 acres, 39S-1E-29- 40 acres. These tracts were inventoried in 1916 and 1917 except for 39-1E-29 which was inventoried in 1921.

Vegetation and management:

Review of the data show that 66% (860 acres) of the surveyed tracts were in the Douglas-fir series of plant associations 31% White fir (400 acres), and 3% Ponderosa pine (40 acres). Late Seral conditions (greater than 10,000 board feet/acre) occurred on 12% (160 acres), 9% (120 acres) in the white fir series, and 3% (40 acres) in the Ponderosa pine series. The Dominant tree species were Pacific madrone is listed on 80% of the parcels - 920 acres, sugar or ponderosa pine also occurs on 80% of the parcels - 920 acres. Sugar or ponderosa pine are the first or second most common species on 57% of the parcels; 680 acres. Pine species and madrone were very common in this part of the watershed.

Timber was harvested on 160 acres in section 21, and the conditions on 93% (1100 acres) of the tracts were recommended for grazing

Wildfire:

Fire evidence included 40% (480 acres) reported burned, comprised of 30% (360) acres in the white fir series, and 10% (120) acres in the Douglas-fir series.
Most of the acreage, 60% (720 acres) had no signs of a recent burn. No 40 acre parcels was reported as completely destroyed by fire. Some portion always remained unburned although it could be small; in one instance 38 acres burned and only 2 acres were untouched. Where fire did occur, 2/3s of the time it was stand destroying.

<u>Reference Condition In The Montane Forest (Circa 1920)</u>

Two parcels were inventoried in Montane forest areas in 1920: 40S-1E-19 - 120 acres, and 40S-1E-21 – 160 acres,

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

Vegetation and management:

Review of the data show that 71% (200 acres) was in the Mountain Hemlock (referred to in the notes as “Larch”), while 29% (80 acres) occurred as Open Glades. Late Seral conditions (greater than 10,000 board feet/acre) occurred on 29% (80 acres). The Dominant and single tree species reported was mountain hemlock.

All 160 acres listed in section 21 had Christmas trees sold from them, and the reports recommended for grazing for the entire acreage inventoried (280 acres).

Wildfire:

No acres were recorded as burned, however, the ridgetops were generally open and 6 of the 7 parcels were completely or partially open glades.

GENERAL LAND OFFICE O & C REVESTMENT NOTES FOR TRACT IN THE ASHLAND WATERSHED.

Legal	Survey Date	Volume / Acre (MBF)	Volume % by Species	NSO Habitat	Series	Burned	Human Presence	Remarks
39S-1E-7								
SWNE	10/9/16	0.3	100% DF (small)	NO	DF	NO	NO	A lot of madrone and buckbrush; good grazing
NWNE	10/9/16	0.1	100% DF (small)	NO	DF	NO	NO	A lot of madrone and buckbrush; good grazing
39S-1E-17								
NWSW	10/8/16	6.0	79% DF, 21% PP (small)	NO	DF	NO	NO	A lot of madrone and buckbrush; very good grazing
SWNW	10/8/16	0.5	100% DF (small)	NO	DF	NO	A farm, 15 ac peaches, fenced with roads	Madrone, buckbrush, DF
NWNW	10/8/16	0	-	NO	-	NO	Road	A lot of madrone, good grazing
39S-1E-19								
SESE	9/4/17	**22.2**	62% DF, 23% WF, 11% PP, 4% SP	**YES**	WF	NO	Abandoned cabin	steep
NWSE	10/7/16	7.0	44% WF, 42% DF, 7% SP, 7% PP (small)	NO	WF	**YES, 10 ac, north side**	NO	Covered with madrone, buckbrush, **high intensity fire**, good grazing
NESE	10/7/16	6.3	60% DF, 26% WF, 10% PP, 4% SP (small)	NO	WF	**YES, 23 ac, west side**	Road	Covered with madrone, buckbrush, **high intensity fire**, good grazing
SESW	9/4/17	8.7	71% DF, 29% PP, cordwood	NO	DF	NO	Abandoned cabin	Ridgetop, $2.50/ac, for goat grazing, $6.50 for cordwood
SWSW	9/4/17	**13.8**	100% PP	**YES**	PP	NO	Trail to the east	Ridgetop, $2.50/ac for goats
NWSW	10/7/16	5.6	41% WF, 36% DF, 23% PP	NO	WF	**YES, 8 ac, east side**		A little madrone and buckbrush, timber not badly burnt, good grazing
NESW	9/5/17	**18.8**	87% DF, 13% WF	**YES**	WF	NO	NO	$2.50/ac for goats, steep, rocky, brushy
SENW	10/8/16	2.3	63% DF, 37% WF (small)	NO	WF	**YES, 20 ac, west side**	Trail	Main ridge, madrone and buckbrush, **high intensity fire**
SWNW	10/8/16	3.5	45% DF, 37% WF, 18% PP (small)	NO	WF	**YES, 38 ac**	NO	A lot of madrone, “sweet” (black?) oak, **high intensity fire**, good grazing
NWNW	10/8/16	4.5	40% DF, 38% WF, 22% PP	NO	WF	**YES, 24 ac, east side**	NO	A lot of madrone and buckbrush, “sweet” oak, **high intensity fire**,

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

			(small)					good grazing
NENW	10/8/16	**10.7**	72% DF, 18% PP, 10% WF	**YES**	WF	**YES, 8 ac, southwest corner**	Trail	A lot of madrone and buckbrush, **high intensity fire**, ridgetop,
SENE	10/8/16	8.8	48% DF, 21% SP, 19% WF, 12% PP	NO	WF	**YES, 2 ac, southeast corner**	NO	Good grazing, dbh avg: PP 30", WF 28", SP 24", DF 24"
SWNE	10/8/16	7.2	57% PP, 26% SP, 17% DF (small)	NO	DF	**YES, 10 ac, southeast corner**	NO	A lot of madrone and buckbrush, **high intensity fire**, good grazing
NWNE	10/8/16	5.0	61% DF, 33% WF, 5% PP, 1% SP (small)	NO	WF	**YES, 25 ac in center**	NO	A lot of madrone and buckbrush, good grazing, **high intensity fire**
NENE	10/8/16	6.5	55% DF, 35% WF, 10% PP (small)	NO	WF	NO	NO	A lot of madrone and buckbrush, good grazing
39-1E-21								
SESE, W1/2	5/26/17	3.3	92% PP, 8% DF	NO	DF	NO	NO	Poor soil, brushy, primarily grazing
SWSE	5/26/17	4.0	50% PP, 50% DF	NO	DF	NO	NO	Rocky, poor soil, brushy, primarily grazing
NWSE	10/6/16	2.6	75% DF, 25% PP (small)	NO	DF	NO	Phone to powerhouse at Ashland creek.	Madrone, buckbrush, manzanita, white oak(?), grazing land,
NESE	10/6/16	3.8	100% DF (small)	NO	DF	NO	Road on creek	Madrone, buckbrush, manzanita,
SESW	10/6/16	6.5	61% DF, 39% PP (small)	NO	DF	**YES, 2ac on the north line**	Past harvest, road	Ridgetop, grazing, madrone, manzanita, buckbrush,
NESW	10/6/16	1.9	65% PP, 35% DF (small)	NO	DF	**YES, 12 ac on the south side**	Road	Grazing, madrone, manzanita, buckbrush
SENW	10/6/16	2.3	100% DF (small)	NO	DF	NO	Road, phone line, DF and PP felled for harvest USFS	Grazing, madrone, buckbrush, manzanita, white oak?
NENW	10/6/16	3.1	86% DF, 14% PP (small)	NO	DF	NO	Phone line to power plant	Grazing, madrone, buckbrush, manzanita, white oak?
SENE	10/6/16	4.2	100% DF (small)	NO	DF	NO	Road	Grazing, madrone, buckbrush, manzanita, white oak?
SWNE	10/6/16	4.9	96% DF, 4% PP	NO	DF	NO	Road, phone line to power plant	Grazing, madrone, buckbrush, manzanita, white oak?

NWNE	10/6/16	5.5	86% DF, 14% PP (small)	NO	DF	NO	Road, timber harvest, DF and PP	Grazing, madrone, buckbrush, manzanita, white oak?
NENE	10/6/16	5.4	83% PP, 17% DF (small)	NO	DF	NO	Road, timber harvest, DF and PP	Grazing, madrone, manzanita
39S-1E-29								
SWNW	11/27/21	1.0	56% PP, 44% DF	NO	DF	NO	NO	Grazing, brushy
40S-1E-19								
NWNE	10/9/20	**15.0**	100% Larch (**Mt. hemlock)**	**YES**	MH	NO	Trail in SE corner	Fair grazing land, rock cliffs on S side of tract, open glades on NW side of trail along ridge, logs 24" @ butt, 5 logs/tree
SWNE	10/9/20	0	-	NO	-	NO	Trail in NW corner	Rock cliffs, open glades, on summit
NENW	10/10/20	4.4	100% Larch (**Mt. hemlock)**	NO	MH	NO	NO	Fair grazing land, rock cliffs open glade W side, timber E side
40S-1E-21								
NENE	10/13/20	8.2	100% Larch (**Mt. hemlock)**	NO	MH	NO	Xmas tree selling area	Fair grazing land, open glades, surface rock, logs 24" @ butt, 4 logs/ tree
NWNE	10/13/20	**10.0**	100% Larch (**Mt. hemlock)**	**YES**	MH	NO	Xmas tree selling area	Open glades, logs 24" @ butt, 5 logs/tree
NENW	10/14/20	1.8	100% Larch (**Mt. hemlock)**	NO	MH	NO	Xmas tree selling area	Fair grazing land 3 logs 24" @ butt, 4 logs/ tree months/year,
NWNW	10/14/20	0	-	NO	-	NO	Xmas tree selling area	**Top of Mt. Ashland,** N side reforesting to scrub "larch" , S half open

Appendix 8.3
John B. Leiberg's 1899 Observations on the Forests and Fire in and around the Ashland Forest Reserve and the Ashland Creek Watershed.

by Darren Borgias M.S., Southwest Oregon Stewardship Ecologist, The Nature Conservancy, September 2004
Submitted to the Ashland Fire Resiliency Community Alternative Technical Committee.

Ecosystem management and the restoration of long term ecological viability in natural systems can be informed by reference to historic observations of past conditions in those systems. Such assessments are especially critical in systems that have been impacted by management over time and for which natural processes are believed to have been altered (Noss 1985). Such records reveal how ecosystems have been expressed, providing a valuable perspective on the background range of natural variability and suggest part of the potential range of future expressions for that system. Historic observations of the forests and forest processes in and around the Ashland watershed reveal the type and magnitude of changes that have occurred in the structure, composition, and functioning of the forests there that have followed roughly 100 years of management that emphasized wildfire suppression.

Forest Conditions in Western Oregon and the Rogue Basin During Euro-American Settlement and Later

Early observations of the region, from just prior to settlement to 50 years after, document the prevalence of fire that influence the pattern of grassland, savanna, woodland and forest on the landscape. Lightning commonly strikes the upland areas to ignite fire on an annual basis. The historic areas burned by wildfire likely depended on daily weather conditions, particularly fuel moisture (humidity) and wind, and the pattern of previous burns that modified fuel loading and fuelbed structure. Aboriginal burning conducted for numerous reasons greatly increased the prevalence of fire. Multiple purposes for aboriginal burning are documented (LaLand 2002). In 1830, David Douglas observed multiple aboriginal burns in the Willamette and Umpqua Valleys which were said by his Indian interpreters to be set to improve hunting by creating isolated green islands in which game would congregate (Davies 1980). The overland party of the United States Exploring Expedition reported observing numerous fires while traversing the interior valleys between the Columbia River and the San Francisco Bay late in the summer of 1841 (Wilkes 1849). Their notes reported "Scorched prairies", "charred forest", "air thick with smoke", and columns observed in the distance on numerous days. Hurrying through the Rogue Valley in September, afraid of the notoriously hostile Takelma Indians, the party camped in burned prairie and then climbed out of the valley the next morning. Ascending the grade toward the Siskiyou Pass, they observed "an old squaw" igniting grass and brush using a large fire brand. Concentrating on her effort, she did not notice the group of forty men on horseback until they were almost upon her.

Historical accounts in the region depict the earliest changes in the structure and extent of vegetation resulting from the curtailment of Native American burning. The Wilkes Expedition noted the role of fire in keeping down undergrowth and the rapidity with which the undergrowth became established where settlers precluded fires. The effect of precluding fires was also observed by General Joseph Lane, who commanded Fort Lane near Lower Table Rock during the 1850's (Walling 1884). Looking back only thirty years after his assignment there, Lane notes:

> *The hilltops now covered by dense thickets of manzanita, madrone or evergreen brush were then devoid of bushes and trees because of the Indian habit of burning over the surface to remove obstructions to their seed and acorn gathering*.

The fire history of the Rogue Valley appears to have been important in impeding succession to more dense stands of vegetation. The background fire regime, mediated by both meteorological and pre-Columbian anthropogenic ignition maintained the pattern of grasslands, woodland, chaparral, and forest of the Rogue River Basin (Franklin and Dyrness 1988, Wright and Bailey 1982).

Forest Conditions in 1899

The United State Geological Survey (USGS) reported in 1900 on a systematic, Township by Township, inventory of the forest resources within the newly established Ashland Forest Reserve that included the Ashland Creek watershed (Leiberg 1900). John B. Leiberg (1853 - 1913), was a botanist and forester whose career with the federal government spanned many of the western States[6]. Leiberg's notes were published in a lengthy, detailed inventory and assessment of the condition of the forests in the Ashland and Cascade Forest Reserves. His 290 page report provides a valuable, detailed and a comprehensive account of vegetation in southwestern Oregon at the turn of the century. The document describes the forests across the region and then provides a township by township accounting of the forest composition and condition. He also described at length and in numerous points throughout the document the prevalence of fire and its effects on forests. I have selected excerpts from his report, providing emphasis on certain points with bold typeface, underline, and sometimes both, and commented separately on his observations.

Leiberg provided a somewhat more detailed set of observations specifically for the Ashland Watershed within the Ashland Forest Reserve, because of its important designation as a municipal water supply. He points out that while the

> *The forest consists of stands of alpine-hemlock, red-fir, and yellow pine types. The alpine-hemlock type occurs on the summit of the peak, and is composed almost wholly of noble fir. The others have the ordinary composition of their respective types elsewhere.*

[6]http://www.oregonflora.org/ofn/v6n2/Leiberg.html

Fires have marked most of the forest, but have not burned in the reserve within the last ten or twelve years to any great extent, except on the summit of the range, at the base of the peak, where the timber on 300 or 400 acres has been almost totally destroyed.

The mill timber in the reserve is of good quality, except in the eastern portion, where fires, years ago, badly seared the most of it. It is generally difficult of access for logging operations. But whether easy or difficult of access, it is obvious that the maintenance of the Ashland Creek water volume is prohibitive to lumbering operations in the reserve.

The areal and timber estimates are as follows:

Forested and other areas in Ashland Forest Reserve, Oregon.

	Acres.
Area forested -	*20, 000*
Area naturally nonforested -	*1,700*
Area deforested by fires of modern date -	*300*

To understand the "ordinary composition" of the forests in 1899, is important to review how Leiberg described the regional vegetation in general, specific types and subtypes, as well as his observations on the ongoing and changing processes for those forest. Leiberg classified the forests by three major climatic zones, the semi-arid, subhumid, and humid. He associated the Ponderosa Pine Type with what he called the "semi-arid" region, an area generally below 3000' in elevation but extending up to 4000' on the southwest slopes of Grizzly Peak, and to 4800' on similar slopes of the Applegate Valley. His observations of forest conditions led him to believe that the semi-arid conditions were expanding, advancing northward, hypothesizing that the cause was climatic change.

…these have their origin in the relief of the country, and possibly in slow climatic changes taking place over the entire western slope of the Cascades and connecting ranges along the coast. They are permanently semiarid, and, if the climatic hypothesis be true, they are gradually enlarging their area.

Leiberg's "subhumid region" accounted for most of the Region and the Ashland Forest Reserve, ranging from 3000 to 6000 feet but starting higher on southwest facing slopes as noted above. In contrast to the semi-arid ponderosa pine, forests of subhumid region were "moderately heavy to dense" stands dominated by Douglas-fir (referred to as "red fir" by Leiberg). For the higher elevations, Leiberg, described the "alpine hemlock" (mountain hemlock) forests of the Humid Region.

Ponderosa Pine Forests

Ponderosa pine type forests covered nearly 24% of the forested acreage west of the Cascades in the Cascade and Ashland Forest Reserves. Leiberg pointed out that while the ponderosa pine had a capacity to occur at elevations between 1,300 and 6,000 feet, that the species reached "its best

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

development" between 4,000 and 5,500 feet." He classified and described six subtypes within the Ponderosa Pine forest.

Leiberg described the open nature of the Ponderosa Pine Type, particularly the paucity of seedlings and saplings, and distinguished the pine forests west of the Cascade divide from those on the east for having greater abundance and variety of understory species and having a greater abundance of Douglas fir mixed in.

> *The yellow-pine type west of the Cascades, as already remarked, averages a smaller percentage of yellow pine in its composition than is the case east of the range. Rarely is it as high as 70, more often it is 60, and more frequently it falls below the standard here considered as representing the type*[7].
>
> *<u>The aspect of the type is that of an open forest with a minimum of undergrowth and seedling or sapling growth</u>. The forest on the eastern side of the Cascades is more conspicuous in this respect than the forest on the western, owing to less variety in the frutescent flora of the former and, in general, to a smaller precipitation. <u>But the open character of the yellow-pine type of forest anywhere in the region examined is due to frequently repeated forest fires more than to any other cause</u>*

Leiberg described six subtypes for the Ponderosa Pine Type forests. The prevalence of madrone and oak stands around the lower fringes of the Ponderosa Pine Type, were associated with the "semi-arid" conditions of the interior valley, much as is found today, including parts of the Ashland area and the Ashland Creek Watershed. Four Ponderosa Pine Subtypes dominated by either Douglas-fir or white fir or a combination occurred in areas extending into the "sub-humid" conditions at higher elevation. These occurred in small stands situated in hollows, depressions, and north slopes, their location and extent dependant only on the requisite soil moisture, and bearing no evident relationship to surrounding seed trees.

> *SUBTYPES WEST OF THE CASCADES*
>
> *The madrona rarely forms groups by itself. Usually it is scattered throughout otherwise nearly pure stands of yellow pine, where it forms a sort of undergrowth…*
>
> *The two species of oak peculiar to the region often constitute the larger percentage of arborescent growth on the lower areas of the yellow-pine forest. They form open growths, sometimes with a great deal of underbrush composed of (*Ceanothus cuneatus *and other* ceanothi*, service berry, hawthorn, and the like; at other times the oak stands are entirely free of undergrowth of any sort. … At higher elevations with greater ratios of precipitation and soil moisture they run from 40 to 60 per cent oak, the balance consisting of pine and fir or of madrona and other species of broad-leaved trees.*
>
> *The subtypes formed by aggregations of red* [Douglas-fir] *and white fir are more common and characteristic than any of the others. They are scattered almost*

[7] Leiberg set the standard for inclusion in his types at 50% of the stands trees greater than 4" DBH.

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

everywhere throughout the stands of the type. ***They are never singly of large extent, from a half acre to one acre being an average size****. The ratios in which the species occur are greatly varied, but the following proportions predominate in the majority of instances:*

Proportion of species forming yellow-pine subtypes.

Percent[8].

1.		*2.*	
Red fir	*60*	*Red fir --*	*50*
White fir	*35*	*White fir*	*50*
Yellow pine	*5*		
3.		*4.*	
Red fir	*35*	*Red fir*	*80*
White fir	*45*	*White fir*	*20*
Yellow pine -	*20*		

The subtypes occur, as a rule, in or along hollows or depressions in the general level, on northern slopes, or on low inequalities of the ground, in short, where the required degree of soil moisture exists. *Neither the presence nor absence nor relative abundance of seed trees of the species on adjacent areas has any influence upon the formation of these subtypes or aggregations. Nor do the tolerance ratios of the different elements that compose them operate in any way to change their composition between the sapling and the veteran stage.*

Of the other elements which constitute the yellow-pine type the most prominent are the sugar pine and the incense cedar. They rarely form any considerable groups or aggregations together or singly, being found mostly as scattered trees among the other species….

For the Ponderosa Pine Type he observed a paucity of duff and litter on the forest floor and its relationship to the prevalence of fire:

The forest floor in the type is covered with a thin layer of humus, consisting entirely of decaying pine needles, or it is entirely bare. The latter condition is very prevalent east of the Cascades, where large areas are annually overrun by fire. But even on the western side of the range, where the humus covering is most conspicuous, it is never more than a ***fraction of an inch*** *in thickness, just enough to supply the requisite material for the spread of forest fires.*

Douglas Fir Forests

[8] Proportions based on abundance of trees > 4” DBH.

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

Leiberg described the Douglas-fir type, ranging from 3,800' to 6,200' and finding its best growth at 4000 to 5800 feet in elevation. He determined that Douglas-fir forests occupied 58% of the forested acreage west of the Cascades. He noted the extremely varied and diverse composition of the forest, incorporating species from the ponderosa pine forests below and the subalpine species at higher elevation. Leiberg did not recognize a forest type for white fir.

> *The red-fir* [Douglas-fir] *type is never a pure type here. In not a single place in the entire region were as much as 200 acres carrying a pure growth of red fir found in one body. While the red-fir component often overwhelmingly outnumbers all the other elements in any particular stand there always is a sufficient quantity of the other species present to make the admixture conspicuous. … Along and between the 5,300- and 5,900-foot contours the red fir predominates. Below these lines are found greater quantities of the species characteristic of the yellow-pine type, while above occur species more or less closely identified with the alpine-hemlock type.*
>
> *Along the lower and middle limits of the red-fir type are seen the effects of the semiarid and subhumid conditions advancing through the yellow-pine type in a diminished density of stands and smaller dimensions of the trees. There is in consequence a broad belt of red-fir type lying adjacent to the yellow pine which naturally could not produce a forest of any but a medium density.*
>
> *…As exhibiting the composition of the red-fir type at lower elevations, or where humidity conditions approach those which determine the yellow-pine type, the following may be taken as representative:*
>
> *Composition of forest in T40S., R 1 W., Oregon* [Upper Applegate and Upper W. Fork of Ashland Creek].

	Percent
Yellow pine	*25*
Sugar pine	*5*
Red fir	*55*
White fir - .	*5*
Incense cedar	*2*
Oak and madrona	*8*

Note: the description above includes a portion of the upper elevations within the West Fork of Ashland Creek. Of particular interest is the very low proportion of white fir, a species that currently overwhelms the composition on a stems per acre basis in many stands.

> The percentage of red fir in stands of the type varies from 50 per cent, which here is considered the lowest ratio for stands representative of the type, to 75 and in some cases to 85 per cent. A characteristic stand, and one which is typical of much of the red-fir forests of the region, contains about 60 per cent of red fir, the balance being made up of varying ratios

of white fir, sugar pine, yellow pine, and occasional trees of incense cedar.

While many contemporary foresters and ecologists in the west point to the influx of Douglas-fir and true firs into ponderosa pine types, including such forests within the Ashland Watershed, at the turn of the century, Leiberg observed the opposite dynamic in the Douglas-fir forests of the Ashland and Cascade Forest Reserves—ponderosa pine advancing under Douglas fir. The cause of this shift may have been the relatively dryer and warmer conditions following the "little ice age", or, conceivably, a period of increased use of fire by the Native Americans just prior to his observations. Such shifts have been recently documented by paleo-ecologists studying pollen deposits in lake sediments.

> *… The tendency of the red-fir type here is always toward added or greater ratios of the species requiring less moisture for their growth. In other words, throughout the region examined west of the Cascades there is every-where a clearly marked extension of the Yellow-pine type elements into the areas of the red-fir type, where they are slowly but surely supplanting the species that need a high degree of soil and atmospheric humidity with species which require a smaller ratio of these factors of growth.*
>
> *… I should say that the red-fir species is, on the whole, assuming minor proportions in the general composition of the type, giving way chiefly to increasing percentages of yellow pine and white fir. The change is slow and gradual, but is steadily progressing, at least on areas of low elevation along the upper limits of the yellow-pine type.*

Leiberg also commented on the structure of Douglas fir forest he observed—relatively densely stocked compared to other forest types, yet shrubs of many species filled the understory beneath the canopy. Compared to the ponderosa pine forests, humus and litter were more abundant.

> *In the red-fir type the forests in these regions reach their maximum density. This holds good for the mature timber as well as for the seedling and sapling growth. The type never has the open aspect which characterizes stands belonging to the yellow-pine type. Except on areas where heavy stands of mature timber effectually shade the ground there is a good undergrowth of many species of shrubs.*
>
> *Humus and litter in stands of the type are moderately abundant. On ground where fires have not run for one hundred to two hundred years humus covers the forest floor to a depth which varies from .3 to 5 inches. The litter consists of broken trees and branches. It is enormously increased in quantity when a fire, even of low intensity, sweeps through the forest.*

Leiberg was cognizant of the numerous varied stand compositions, and dynamics within stands due to the variable effects of fire and the site potential determined by the moisture available. Leiberg's perception was limited in part by his classification which contained a very broad Douglas-fir type and only a white fir subtype within it. Within Douglas fir stands, Lieberg attributed reproduction dominated by white fir events to disturbance by relatively more severe fire. He believed that white fir that was established in such events "dwindled" over time,

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

eventually giving way to Douglas fir. Leiberg did not recognize the role of low or moderate-severity fire in mediating this transition to Douglas fir.

> *The lesser groupings of the species which form the general red-fir type are very numerous, but* ***mostly of small areal extent in any one locality****. The most common subtype in our region is one in which white fir forms the chief component. In every case the ascendancy of this species can be traced to the effect of forest fires.*
>
> *Where fires have ravaged*[9] *the stands, the red fir will come again as the primary and principal seedling growth, provided the fire was one of low or moderate intensity. Where the stands have been totally destroyed or the destruction amounts to 75 per cent and upward red fir may come as the chief growth if the local seepage is sufficient to maintain the requisite degree of soil humidity.*
>
> *The stands of the white-fir subtype furnish in their numbers, extent, and ratios of composition unfailingly guides for the estimation of the extent and age of fires in the red-fir type before the advent of the white man.*
>
> *It is rare, however, to find the white-fir stands maintaining their numerical superiority into maturity. It is more often the case that a white-fir stand or reforestation which starts in the seedling stage with a ratio of 70 to 80 per cent has dwindled by the time it has reached a well-advanced sapling stage to a ratio of 20 to 35 per cent of white fir, the balance being red fir principally.*

Leiberg described the occurrence of ponderosa pine subtypes within the Douglas-fir Type, largely considered successional expressions that would give way to Douglas fir. He also describes the relatively minor role of sugar pine widely spread through the type.

> *The yellow pine occasionally forms stands and becomes a subtype. We may consider it a subtype on the grounds that on the areas here in view it is a temporary reforestation after fires, and while the particular stand may grow to a sort of "immature" maturity it will not reproduce itself in a preponderating ratio. Subtypes consisting of 10 to 80 per cent yellow pine surrounded with dense red-fir growths on the same level are found in many places. Good examples occur in the massive, veteran red-fir growths in the Rogue River Vallev… Here yellow-pine reforestations have reached maturity, are in at state of decay, and are gradually being replaced by red fir, which advances from the surrounding' forest to close the gap.*

Sugar pine occurred throughout the Douglas-fir Type, but at low abundance.

> *The sugar pine never forms stands of pure growth, nor does it ever exist among other groups in preponderating or large ratios. It is a tree that, whatever may have been the case in past times, is now decidedly deficient in reproductive*

[9] His bias against fire is evident in the statement where he described fires having "ravaged" but recognized that fires occurred with a range of low, moderate, and high severity.

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

capacity in this region. It therefore exists as scattered trees among the mass of red fir and other species of that type.

Again, Leiberg described a very broad Douglas-fir type that extended to and included species typically associated with more subalpine settings. He included both the western white pine found at higher elevation, its few and declining numbers, and also some noble fir stands within the Douglas-fir type. Stands where the predominance of noble fir was greater, Leiberg ascribed as a subtype to the Alpine Hemlock Type.

The white pine rarely occurs in sufficient numbers to form stands distinguishable as subtypes. It is mostly found scattered throughout mixtures of red and white fir in the middle and upper areas of the red-fir type. ... It is an open question whether the species is maintaining its present general ratio in the forests of red-fir type in the region…. Its reproductive capacity here is certainly poor. The number of veterans and standards throughout the forest is greater than the sapling growth of the species.

The noble fir is plentiful in numerous localities along the upper areas occupied by the red-fir type…. More frequently the percentages of the different species stand as follows: Red fir, 25 per cent; white fir, 20 per cent; noble fir, 55 per cent.

Ecological Processes of Fire and Succession

Leiberg commented on the successional processes of the forests—the transitions in composition he observed, attributing them to the variable influence of fire and change in soil moisture due to historic variation in climatic conditions. He described the multiple successional pathways he observed for the development of the forests. His observations provide a basis for considering a wider range of forest stand development trajectories than typically accounted for by modern ecologists.

The numerical status of a species in the early stages of growth is determined in this region by its environments as regards shade, and by the multitudinous modifications and departures from the composition of the original growth on areas undergoing reforestations after fires.

While Douglas fir was the numerical dominant, providing a greater percentage of the forest trees in the region west of the Cascades, he considered ponderosa pine the “superior” species because of its ability to endure and survive fire— what some refer to as fire resiliency. Note that here he emphasized survival of small trees in the “oft-repeated” sweeping fires.

The cause lies entirely in the oft-repeated forest fires which sweep through these wooded areas. The seedlings and young trees possessing the greatest fire resistance survive, the others die. In its capacity to endure fire and survive the yellow pine is greatly the superior of all the other conifers in this region.

Leiberg described a dynamic forest that rapidly changed through time.

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

> [The subtypes of forest] … *frequently change, sometimes two or three times in a generation. Forest fires are fertile causes for inducing such rapid changes. But even when left undisturbed a subtype rarely persists in any particular locality for more than 250 or 300 years.*

He described the fire mediated dynamics of forests at lower elevations, particularly encroachment of Douglas fir into ponderosa pine and the opposite.

> *…West of the Cascades the yellow-pine tracts in some places barely hold their own. Along their upper and higher limits there is occasionally a decided tendency toward a larger proportion of red fir* [Douglas-fir] *as the coming forest.*
>
> *There are cases observable in many localities along the upper limits of the yellow-pine type where stands of red fir are slowly replacing yellow pine. These are not due to extensions of red-fir areas, but are merely cases in which the red fir is again asserting its supremacy on tracts whence it was driven by forest fires long ago.*
>
> *In the middle elevations of its range yellow pine is often found to have supplanted tracts of nearly pure red-fir stands. This shifting about is due chiefly to forest fires. On areas where yellow pine has replaced red fir there has been a decrease in the ratio of soil humidity necessary to the maintenance of the red-fir preponderance. The same condition has existed along the upper limits of the type where now red fir shows a coming ascendancy over the yellow-pine element, due to a return to higher soil-moisture ratios.*

Patterns in Fire Intensity and Extent

Under a section referred to as "AMOUNT AND DISTRIBUTION OF COMMERCIALLY VALUABLE TIMBER", Leiberg describes at length the effects of fire in the region, concerned as he was about the use of the resource. Despite his bias against fire, he provided a great deal of insight into the ecological functioning of fire. He documented fire evidence in every township to varied degrees. He interpreted the evidence of fire and provided some insight into the fire history. His observations led him to believe that fires prior to settlement were typically smaller than during the settlement era, and less frequent.

> *EXTENT OF FIRES-- Fires have widely ravaged the region examined. There is not a single forested township either on the west side or on the east side of the range in which the timber is not more or less fire marked.*
>
> *TIME OF FIRES-- …But, on the other hand, the great diversity in the age of such stands as show clearly their origin as reforestations after fires, proves that the fires during the Indian occupancy were not of such frequent occurrence nor of such magnitude as they have been since the advent of the white man.*
>
> *The fires were more numerous and devastated much larger areas in the early days of the settlements than they have done in later years. Much the larger*

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

percentage of what may be classed as modern burns date back twenty-five to forty years. As time has passed, the frequency of forest fires in the region has much diminished.

Along with decreased incidence of intentional and negligent ignition, and outright suppression, he emphasized the role that previous fires played in moderating fuel accumulation which controlled extent and the intensity and severity of future fires. He did not directly account for the contribution of understory vegetation and small trees as ladder fuels.

This [decreased incidence and extent of fires after early settlement] *is owing to a variety of causes, chief of which are* ***<u>the numerous fire breaks caused by the earlier burns</u>****<u>;</u> the gradual extinction of the game and consequent diminished number of hunting parties and lessened risk from unextinguished camp fires; the acquisition of valuable timber claims by private parties throughout the heavily forested sections and the measure of protection, prompted by self-interest, bestowed on their property and incidentally on adjoining areas, and, lastly,* ***<u>the destruction of the humus layer, the chief factor in the spread of forest fires in this region, by the earlier conflagrations and the insufficient accumulations of this material since then to support hot, large, and destructive fires</u>.***

Leiberg noted that evidence of burning in the region prior to settlement indicated small fires, and cited an example of a large fire at 5000 acres. Leiberg was unlikely to be able to discern if some of the small fires may have been small patches, severely burned, within a matrix of low severity fire on a larger scale. Benefiting from first-hand local knowledge about fire behavior and fuels, the Native Americans may have been able to intentionally control to some degree the extent of fires, but that control was likely largely predicated upon use of previously burned area.

The age of the burns chargeable to the era of Indian occupancy can not in most cases be traced back more than one hundred and fifty years. Between that time and the time of the white man's ascendency (sic), *or, between the years 1750 and 1855, small and circumscribed fires evidently were of frequent occurrence. There were some large ones. Thus, in T. 37 S., R. 5 E., occurs a growth of white fir nearly 75 percent pure covering between 4,000 and 5,000 acres.*

Larger, more recent post settlement fires were documented. Leiberg sited a burned area covering nearly 59,000 acres in seven townships (161,280 acres in total) north of Mount McGloughlin ("Mount Pitt"). A burned area of 60,000 acres was documented east of the Cascades that showed the remains of lodgepole stands that followed burned and killed ponderosa pine forests. Fire intensity and severity were variable.

Much of the region under examination is composed of high subalpine regions which naturally carry light stands of timber. Extensive fires have devastated them at various times. Reforestations of all ages and differing in composition cover them. … In other places fires have destroyed a certain percentage of the forest. The damage may vary from 10 to 60 per cent or higher. The destruction has not been all in one place or body. The fire has run through the forest for miles, burning a tree or a group of trees here and there.

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

Reforestations after fires at middle elevations on the western slopes of the Cascades… are extremely varied and complex.

Post-Fire Forest Development

Leiberg described forests in the Cascades that were much like forest currently found in parts of the Ashland Watershed. Areas with veteran Douglas fir, sugar pine, and ponderosa pine with the understory reproduction dominated by white fir.

Fires in the mixed growth or in timber stands where the red fir predominates are frequently followed by great masses of white-fir seedlings, which develop into heavy and dense forest stands, and occupy the ground for a century or more. An example of this kind occurs in T. 37 S., It. 5 E. We here have a forest composed almost wholly of white fir, in the midst of which rise here and there huge veterans of red fir 400 to 500 years old. The white fir is a reforestation, a hundred years old, following a burn which destroyed a mixed growth in which red fir largely predominated. Notwithstanding the fact that large numbers of seed trees of red fir escaped destruction, this species was quite unable again to occupy the ground as the first forest growth after the fire.

Leiberg emphasized that forest regeneration following fires depended most importantly on soil moisture characteristics of the site. He did not distinguish how the eventual success of a reproductive event might be affected by subsequent low intensity fires.

The tendency of all reforestations after fires in the humid and subhumlid forest types is to form pure-growth stands of the species naturally occurring in the region, the condition or ratio of soil humidity, an ever-varying factor, determining the particular species. The abundance or scarcity of seed trees and the degree of tolerance possessed by the various species are factors of trifling importance.

Soil erosion following fire was observed by Leiberg, but he considered it not very conspicuous except in the pumice soils of the Cascades.

The effects of forest fires in their relation to the accelerated transfer of soil and rock debris from higher to lower levels are noticeable everywhere throughout the region, but are not very conspicuous outside the pumice-covered areas [in the Cascades].

It is perhaps noteworthy that Leiberg generally did not observe or notice signs of disease, pathogens, or parasitic plants among the forests, except for a few incidental comments on trees with rotten cores in some instances (white fir, cedar, oak) induced by fire sears and scars.

Observations Specific to the Townships Covering the Ashland Creek Watershed

Leiberg provided general descriptions of the setting and forest character on a large scale for each Township in the Forest Reserve. His notes reveal that much of the forest had already been partially logged, and that most areas had been burned to varying degrees.

The first township description covers the area centered on the current City of Ashland up to the confluence of the East and West Forks of Ashland Creek (figure 1). His summary of the composition of the forests is compiled in Table 1.

> *TOWNSHIP 39 SOUTH, RANGE 1 EAST.*
>
> *The extreme western portions of this township consist of low, sparsely timbered slopes, with heavier stands in the ravines; the central portions comprise agricultural and grazing lands while the eastern mainly include semiarid, rocky, nonforested slopes* [below Grizzly Peak]. *The forest is of poor quality throughout. Since the first settlement of the region* [Ashland] *it has been culled and burned repeatedly. Private holdings have conserved some of the better portions. In general the timber is of little commercial value.*
>
> *TOWNSHIP 39 SOUTH, RANGE 1 WEST.*
>
> *This township comprises steep rocky slopes, draining partly into Applegate Creek, partly into Bear Creek. Originally of good proportion, the forest has been culled during many years and stripped of its best timber, only a trace remaining. Fires have wrought great havoc and have transformed many of the slopes into great brush heaps with thin lines of half-dead trees in their midst.*

In the next township, centered on Mt Ashland, the importance of ponderosa pine and sugar pine and the lack of a mention for white fir for the upper Ashland Watershed is remarkable, given the prevalence of white fir there now. His map for the range of white fir points to lower elevation positions for the species (Figure 2) and the wide ranging distribution of ponderosa pine in the Watershed (Figure 3).

> *TOWNSHIP 40 SOUTH, RANGE 1 EAST.*
>
> *This township consists chiefly of high rocky combs and ridges culminating in Siskiyou Peak* [Mt Ashland]. *It forms the larger portion of the Ashland Forest Reserve* [including most of the upper Ashland Watershed]. *Along the higher slopes the forest occurs in scattered stands, largely composed of noble fir. The lower areas bear good stands of yellow and sugar pine. The red fir is mostly of small growth. Fires have run throughout the forest in the township. The summit of the ridge near Siskiyou Peak has been burned to the extent of 75 per cent within the last two or three years. Although a forest reserve for the purpose of supplying the town of Ashland with pure water, sheep are permitted to graze on the high slopes, defiling the water.*
>
> *TOWNSHIP 40 SOUTH, RANGE 1 WEST.*

> *This township consists of high slopes and summits of the Siskiyou Range. The highest slopes are largely nonforested, either bare, rocky expanses or grassy glades predominating* [south slopes Wagner Butte]. *The lower elevations bear moderately heavy stands of fair quality. The forest is seared by fire in all of its parts, and is generally difficult of access. A portion of the township forms part of the Ashland Forest Reserve* [Upper West Fork of Ashland Creek].

The table provides clear portrayal of the minimal role of tree species in the forest within and surrounding the Ashland Creek Watershed during the 1899 inventory. Ponderosa pine dominated in the watershed from the forks of the Ashland Creek downstream. Douglas fir was secondary in importance. At higher elevation, Douglas fir, ponderosa pine and noble fir dominated in the upper settings above the confluence of the forks and over the summit. Sugar pine played an important role in the forests at the time. The table clearly portrays the minor role played by white fir in any of the forests in the townships covering the Ashland Watershed. These conditions are notably different from what is observed today, with white fir the prevalent species in terms of trees per acre over much of the watershed at middle elevations.

Altered Fire Regime

The background fire regime has been altered in terms of the characteristic fire intensity, duration, periodicity, and scale, and the severity of effects on vegetation. A significant proportion of the landscape at low and middle elevations historically had greater capacity to support and a larger expression of relatively "open", complex, mixed-conifer stands dominated by large fire-tolerant ponderosa pine and Douglas fir. These systems were maintained by a fire regime characterized by relatively frequent low intensity/severity fire with small patch inclusions of moderate and severe effects. Overlapping and interacting with this background disturbance were more random events with larger expression of severe effects mediated by climatic events and feedback with variation in the low intensity fire frequency. With recurrent low severity fire, seedlings and saplings were periodically killed, and recruitment of individual trees and clumps was metered out over decades or centuries to create multi-age stands. Variation in the interval between fires, and in the intensity and severity of fires, contributed to the patch dynamics and complexity within and among stands.

Currently, most ignitions of fire are extinguished quickly after they cover a small area. Slow moving and less intense fire, typically backing down hill or up wind, or burning in the relatively moist end of the weather spectrum are the most easily suppressed and the potential acreage they could influence, untrammeled, is truncated. Fire breaks such as roads, ditches, and other development augment suppression efforts to reduce the overall scope of lower intensity burns.

Shortly after Euro-American settlement, in the relative absence of frequent low intensity fire, and followed by increasingly effective suppression of moderate severity fire into the late decades of the 20th Century, stand densities and fuels generally increased. In the absence of recurrent fire in low and middle elevations, entire cohorts of young recruits grew up with their density without thinning by fire. Relatively shade-tolerant species followed in some settings— Douglas fir or white fir, in natural succession, increasing the landscape expression of mid-seral closed canopy stands, changing the diversity of structures, species, and fire behavior within stands and among stands across the landscape at various scales. Increased density of retained regeneration increases

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

the intensity and severity of fires, depending on the age and structure of recruits within the stand. Compared to fuel beds regularly reduced by recurrent fire, forest stand with dense tree reproduction lower the threshold of weather conditions necessary to generate severe effects. Landscapes with greater continuity of such fuelbeds contribute to the potential for extensive spread of flaming fronts with severe effects generated under severe fire weather (e.g. Hayman, Rodeo-Chedeski, Biscuit, et al.) . The ground covered by such intense, fast moving fire fronts with more severe effects has arguably increased in area within and among fire events due to the accumulation and continuity of potential dead and live fuel within and among stands.

Concern has been raised in particular about the ability to retain intact late-successional habitats and large, old stands of fire-maintained pine forests which have already been reduced through a 150-year history of timber harvest, especially in the lower and middle elevations.

Conclusion

John Leiberg's 1899 assessment of the Forest Reserves in southern Oregon, including the Ashland Creek watershed, reveals the highly dynamic forests occupying the landscape at the time. The development and condition of forests depended on the recurring and variable influence of fire to mediate recruitment events and subsequent differential survival of individual trees based in the species' relative tolerance to later fires. Leiberg highlighted the pervasive role of fire in forests across the landscape, yet also how the spread of individual fires were reduced where wildfire encountered areas burned earlier. He noted how the fuel accumulated and changed fire behavior after only several decades, and that the size of fire events varied with the patterns in the frequency of fire for the region. The highly varied and dynamic forest development for this region was mediated by a fire regime that combined the effects of frequent fire of low intensity and more randomly occurring mixed and high severity fire events.

His observations bring to light the dramatic changes in the composition and functioning of the forests that have occurred in the last 100 years. Specifically for the Ashland Creek Watershed, the presence of relatively open ponderosa pine was greater in extent and abundance, and white fir was remarkably lower in abundance at the turn of the last century. Leiberg's detailed and comprehensive observations on forests and fire provide the basis for managers and society to open wider their concepts of forest development to include multiple pathways and a wide range of potential for this landscape.

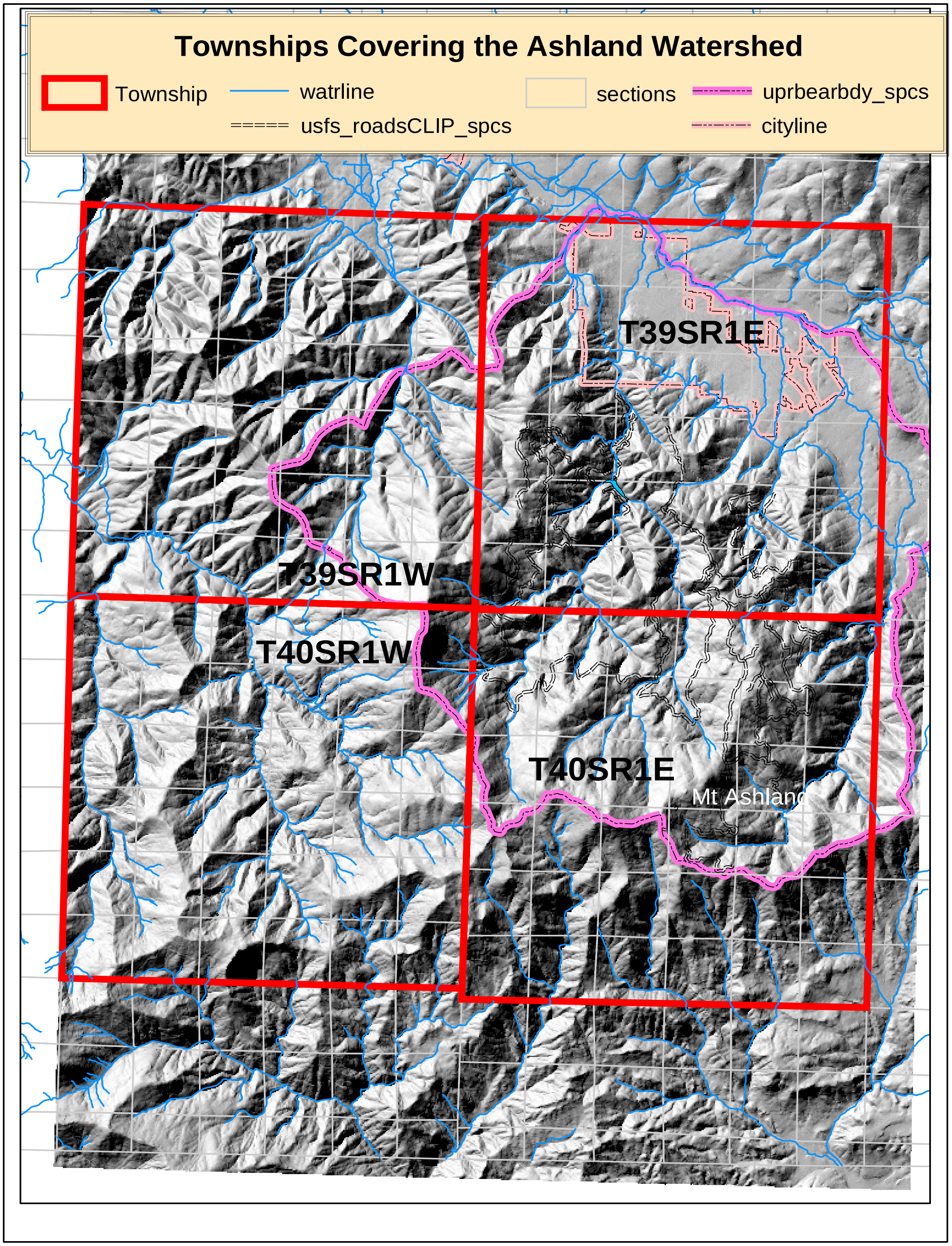


Figure 1: Townships covering the Ashland Watershed

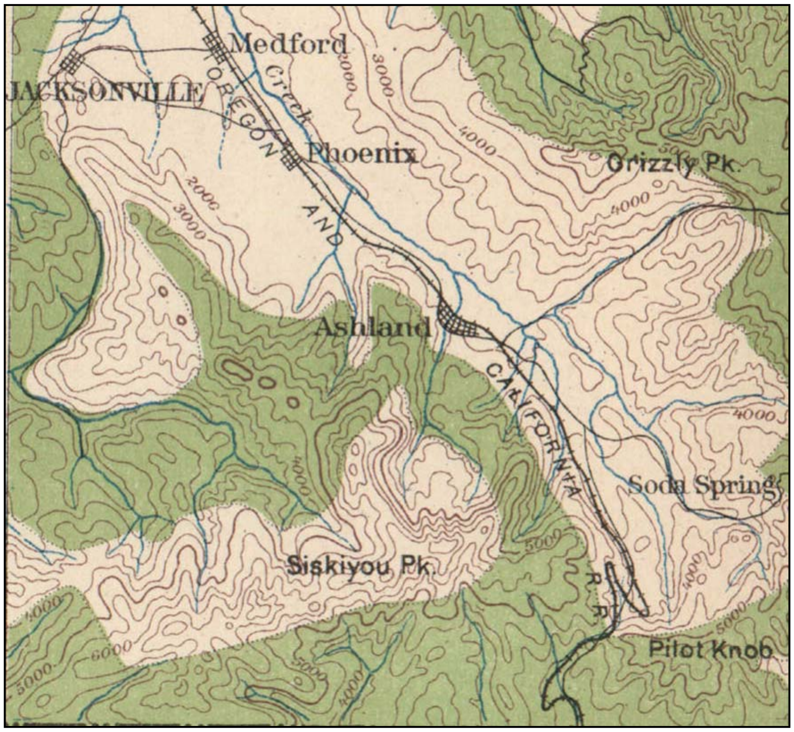


Figure 2. Part of Southern Oregon Showing the Distribution of White Fir (green shading). From Leiberg, 1900, USGS, 21st Annual Report, plate LXXX. Siskiyou Peak was the former name of Mt Ashland.

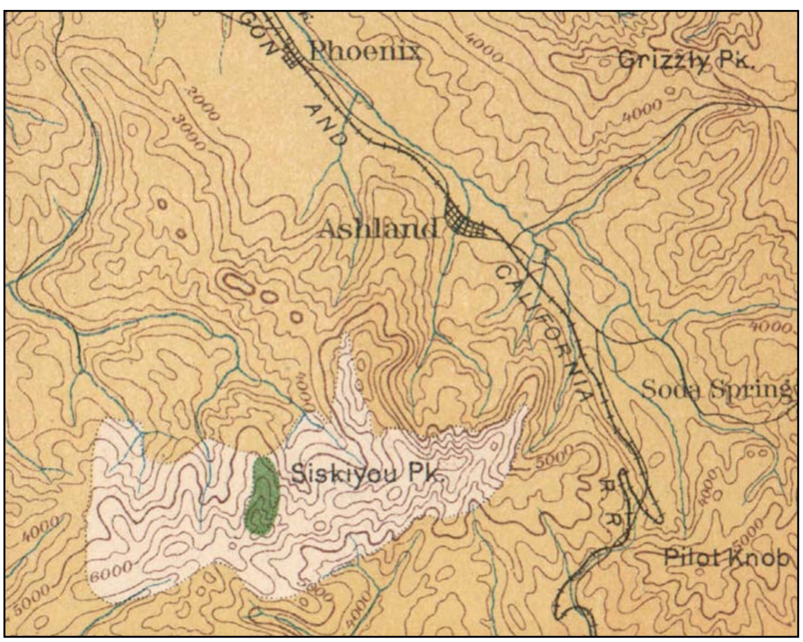


Figure 3. Part of Southern Oregon Showing the Distribution of Ponderosa Pine (in tan shadding), and Whitebark Pine (green shading). From Leiberg, 1900, USGS, 21st Annual Report, plate LXXXII. Siskiyou Peak was the former name of Mt Ashland.

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

Table 1. Summary of forest inventory statistics from Leiberg (1900) for the Townships covering the Ashland Creek Watershed and nearby.													
							Forested Stand Composition (percent of trees >4") by species						
Township and description	**Forested Acres**	**Non Forest Acres**	**"badly" burned Acres**	**Forest Burned %**	**Logged Acres**	**culled %**	**Ponderosa pine**	**Sugar pine**	**Douglas fir**	**Incense cedar**	**Madrone and oak**	**White fir**	**Noble fir**
40SR1E Branches of Ashland Creek above and south over the Mt Ashland summit.	18540	4500	2200	12	500	0	23	10	30	2	5	5	30
39SR1E Ashland Watershed from the forks of Ashland Creek north over Bear Creek	8040	15000	see note in text	see note in text	8040	50	60	15	20	-	5	-	-
40SR1W Wagner Butte, Upper Applegate	17040	6000	6200	36	0		20	3	50	3		3	12
40SR2W Applegate River Valley	19240	3800	4300	22	1800	65	40	2	45	0.5	9.5	-	3
39SR1W Middle Bear Cr, south into the Upper Applegate	17240	5800	3100	18	17240	45	70	8	20	-	2	-	-

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

Literature Cited

Davies, J. 1980. Douglas of the Forests: The North American Journals of David Douglas. University of Washington Press, Seattle.

Franklin, J. F., and C. T. Dyrness 1988. Natural Vegetation of Oregon and Washington. Oregon State University Press, Corvallis Oregon.

LaLande:

Lane, J. 1884. History of Southern Oregon. Portland, OR, A.G. Walling, editor. p. 316, 334.

Leiberg, J.B. 1900. Cascade Range and Ashland Forest Reserves and adjacent regions. in United States Geological Survey, 21st Annual Report, 1899 - 1900 Part 5, Forest Reserves, pp 211-498.

Noss, Reed F. 1985. On characterizing presettlement vegetation: How and why. Natural Areas Journal v. 5(1) pp. 11.

Walling A. G. 1884. History of Southern Oregon. A. G. Walling, Portland, OR, p. 316, 334.

Wilkes, C. 1849. Narrative of the United States Exploring Expedition during the years 1838, 1839, 1840, 1841, 1842. Volume V pages 215-250.

Wright, H.A. and A.W. Bailey, 1982. Fire Ecology: United States and southern Canada. A Wiley Interscience publication, New York. 501 pp.

.

APPENDIX 8.4

WILDLAND FIRE RESTORATION

Submitted to the AFRCA technical team by Jay Lininger, Conservation Fellow, University of Montana

Wildland fire is critical to ecosystem function

Fire is an essential natural disturbance in forest ecosystems of the Siskiyou Mountains (Agee 1993, Atzet and Wheeler 1982, Frost and Sweeny 2000, Taylor and Skinner 1998). Indigenous species and communities evolved with periodic fire disturbances, and the life history characteristics of some require fire for persistence (Sawyer et al. 1977, Martin 1997). It follows that biodiversity conservation in Siskiyou forests depends on the extent to which land managers allow natural fire to play its keystone role in the ecosystem (Hardy and Arno 1996). Further, Lindemayer and Franklin (2002) observe that naturally regenerated and maintained early-successional forests, with their richness of coarse woody structure and non-woody vegetation, may now be the scarcest of all habitats in the Pacific Northwest due to many decades of fire suppression and post-fire salvage logging.

Federal policy demands wildland fire use for ecosystem restoration

Recognizing that wildland fire is "a critical natural process [that] must be reintroduced into the ecosystem," the 1995 Federal Wildland Fire Management Policy and Program Review and the 2001 Review and Update of the Federal Wildland Fire Policy ("Federal Fire Policies") commit agencies to shift away from systematic fire exclusion and to use prescribed and natural wildland fire for restoration of fire-adapted ecosystems (IWG 2001). The change in policy to use fire for resource benefits, and Congressional authorization to use suppression funds to manage wildland fire without attacking it, have resulted in more lightning-ignited fires burning on national forest land in the Sierra Nevada, the Rocky Mountains and elsewhere.

Management-ignited prescribed fire can sustain ecological functions with trade-offs

Use of management-ignited prescribed fire can help to sustain ecological functions that have been limited or rendered dormant by fire exclusion, and it has been used effectively in the restoration and maintenance of wildlife habitat (Arno 2000, McMahon and deCalesta 1990). Use of prescribed fire should vary in frequency and scope of application depending on the natural role of fire on specific portions of the landscape (USDI 1998).

Prescribed fire probably cannot replicate all of the ecological functions of lightning-ignited fires that burn in a full range of environmental conditions. Federal land managers in the Siskiyou Mountains typically ignite prescribed fires during the wet season (late fall through spring) to minimize smoke production and risk of escape (Chandler 2002). It is

Public Works Tel: 541/488-5587
20 E. Main Street Fax: 541-/488-6006
Ashland, Oregon 97520 TTY: 800/735-2900
www.ashland.or.us

hypothesized that, in many cases, wet season burning can negatively affect plants and microorganisms due to more efficient heat conductivity deeper into soil layers than would occur in the dry season (Agee 1993).

A key problem with use of prescribed fire during the wet season is its incompatibility with the natural life histories of indigenous plants. Research has shown that moistening seed of chaparral plants that are not hard-seeded (i.e. species other than *Ceanothus* and most legumes) causes them to completely lose their heat tolerance (Sweeney 1956, Parker and Roger 1988). These seeds take up moisture seasonally, and as they dry out in summer, they become tolerant of high levels of heating. Seeds are likely to be especially vulnerable to burning after soils have been moistened in fall, but before fuel moisture has risen appreciably, because considerable heat could still be generated by fire at this time. Thus, burning under these conditions is likely to produce unnaturally high seed mortality and result in artificially low seedling emergence (Parker and Roger 1988). This would have adverse, long-term impacts in stands lacking resprouting species.

On the other hand, if soils are very moist at the time of fire, and fireline intensity is low, little soil heating will occur (DeBano et al. 1979). In this situation, hard-seeded species may not receive sufficient heat shock to germinate, resulting in a similar scenario of high seed mortality and low seedling emergence. Thus, wet season burning in areas dominated by non-sprouting shrubs (*Arctostaphylos viscida*, *Ceanothus integerrimus, C. velutinus* and *C. prostratus*) may have poor regeneration of shrubs and other fire-recruiting species. Populations will be reduced as a result, and seed banks will be depleted. These species are not likely to be resilient to these effects (Odion 2002).

Another factor that can contribute to reduced post-burn shrub recruitment is spring burning followed by rainfall sufficient to induce germination of surviving seeds. Seedlings that establish from such late germination have been found to have greater mortality during their initial summer (Moreno and Oechel 1993).

Furthermore, burned areas of poor shrub regeneration will be more prone to invasion by yellow star thistle, cheat grass or other annual grasses. The fine fuel of these annual grasses can carry fire and allow for a reburn before shrubs begin to produce seeds (Odion 2002). Mortality of young resprouts can occur during such short-return fire events, and shrubs may become too depleted to resprout again. Thus, successive, short-rotation (< 5 years apart) fires can largely eliminate chaparral (Zedler et al. 1983). The shallow-rooted and quickly curing grass and weed vegetation that replaces chaparral under such type conversion will ignite more easily over a longer portion of the year, spread fire more rapidly, make slopes vulnerable to a future regime of more frequent fire and disturbances related to reduced slope stability in the absence of deep rooted shrubs.

Prescribed fire effectively reduces fire hazard

Prescribed fire is by far the most effective means to calm wildland fire behavior, but other fuel reduction methods including tree cutting are more widely used (USDI 1998).

Stephens (1998) characterizes application of prescribed fire as "the most effective treatment for reducing fire behavior in mixed conifer ecosystems." Computer simulations run by Stephens (1998) and van Wagtendonk (1996) show significant reductions in fire heat energy output and rate of spread following prescribed fire.

The amount, continuity, porosity and moisture content of fine and intermediate-sized fuels (< 3 inches in diameter) influence the heat energy released by the flaming front as well as the rate at which it spreads (Rothermel 1983). The ability of prescribed fire to consume fine and intermediate fuels smaller than three inches in diameter is a unique advantage over other fuel reduction methods that focus on larger, less flammable fuels. Prescribed fire consumes dead surface fuels and reduces the continuity of both dead and live ladder fuels that may facilitate vertical movement of fires from the ground into tree crowns (Carey and Schumann 2003, Graham et al. 2004).

Prescribed fire is practical and cost-effective

Use of prescribed fire may be a viable fuels treatment option on terrain where steepness or accessibility might limit mechanical treatments (Chandler 2002, Weatherspoon 1996). Existing roads often can be useful as control lines along with other natural and managed landscape features.

Prescribed burning costs significantly less than other fuel reduction treatments. Average investments of $300 per acre may be adequate to burn several hundred acres at a time, even on topographically complex landscapes such as the Ashland Creek watershed (Chandler 2002). Depending on the size of burn units, distance from the nearest road, and topographic complexity, service contract costs in the Ashland Creek watershed have ranged from $32.96/acre to $634.48/acre. This does not include the preparation of burn plans, which can range from $360.50/acre to $772.50 /acre (Betlejewski 2004). Financial costs increase if pre-treatment is required to reduce ladder fuels and enhance worker safety. In contrast, operating costs for mechanical fuel treatments typically start at $800 per acre and can reach $2,100 per acre on challenging terrain (USDA 2001).

The financial benefits of fire hazard reduction using prescribed fire also can be measured by savings in future suppression costs and decreased resource losses (Cleaves and Brodie 1990). Fuel modifications resulting from prescribed fire can reduce wildland fire impacts and make future control efforts or burning operations less dangerous and expensive.

Constraints on use of prescribed fire

Several factors including risk of escape, air quality and sensitive habitats complicate the use of prescribed fire:

- Risk of escape

Initial burns in forests with high fuel loading may pose a risk of escape, especially if inexperienced planners and crews implement them. In areas where surface and ladder fuel loading is high, some form of pre-treatment may be necessary to create desired forest structure and in turn facilitate safer fire use (Brown 2000). Manual fuel reduction treatments including pile-and-burn and ladder fuel pruning can effectively prepare a site for burning without significantly impacting soils or wildlife habitat (Graham et al. 2004, Keyes and O'Hara 2002).

- Air quality restrictions

Air quality regulations and public resistance can seriously limit the use of fire for ecological restoration (Shelby and Speaker 1990). Cooperation between air quality regulators, land managers and the public is essential if fire is to be viably used as a management tool. It will be necessary for land managers educate the public about the benefits of using prescribed fire to reduce fuel loadings and wildfire hazard, with its attendant benefits of decreased suppression costs and smoke emissions.

- Sensitive habitats

If prescribed fire is a preferred means of restoring fire-adapted forest ecosystems where use of naturally-ignited fires is not an option, success may require sequential entries before desired conditions are realized, especially in dense stands with heavy fuel loads (Weatherspoon 1996). Several workers recommend staggered burn treatments over five-to-eight years (e.g., Agee et al. 2000, DellaSala et al. 1995). However, depletion of multi-layered forest structure can degrade habitat for associated species like northern spotted owl and northern goshawk. Prescribed fire therefore should not be implemented in sensitive habitats over wide areas in the same vicinity over a single decade (Agee 1993). Rather, burns should be conducted under conditions where important structural habitat elements, such as larger old trees, can be protected (Agee and Huff 1986). Periodic monitoring should follow burning treatments to determine whether restoration goals have been met and when such activities should cease or be repeated (DellaSala et al. 1995).

Fire management planning is critical to use wildland fire for resource benefit

The Federal Fire Policies require development of fire management plans (FMP) covering every acre of federal land with flammable vegetation. FMPs offer the strategic framework for the full range of fire management actions including hazardous fuel reduction and forest restoration, use of wildland fire, as well as fire prevention campaigns and fire suppression incidents. The primary barrier to use of naturally-ignited fire is the lack of an approved FMP that provides for it. Without such provisions, plans require land managers to aggressively attack every fire to minimize its size. A lack of interagency planning across political boundaries also hampers the use of fire across landscapes (USGAO 2001).

Over the ridge from the Ashland Creek watershed, the FMP for the Klamath National Forest portion of the Mount Ashland Late-Successional Reserve ("South Zone FMP") permits the use of naturally-ignited wildland fires and modified suppression strategies under prescribed conditions stating, "the importance of an ecosystem response to fire is the intensity of the fire, not the area covered" (USDA 1996a, 73). This is consistent with the Federal Fire Policies.

In contrast, within the Ashland Creek watershed, the FMP covering the Rogue River National Forest portion of the LSR ("North Zone FMP") mandates a Level 1 suppression response to all wildland ignitions regardless of location or environmental conditions (USDA 1996a, D-22 to D-24). This is despite the plan's recognition that continued exclusion of wildland fire from the ecosystem "will lead to increased conifer mortality and increased risk of large-scale stand-replacing fires" (USDA 1996a, 48). This is not consistent with the Federal Fire Policies because reintroduction of natural fire process to the landscape is precluded.

The social demand for a municipal water supply from the Ashland Creek watershed obviously accounts for the difference between the two plans. Indeed, the Forest Service states that it cannot let natural fires burn in the North Zone of the Mount Ashland LSR because

> 40 to 90 years of live and dead vegetation build up (due to missed fire cycles and fire suppression activity) has created a situation with a high probability of a wildfire escaping management suppression capabilities, which would likely result in stand replacing wildfire… The use of [fire] under current conditions, with the high probability of stand replacing wildfires, would be inconsistent with Late-Successional Reserve objectives of the Northwest Forest Plan, and with the Cooperative Agreement between the Forest Service and the City of Ashland for the protection of water quality (USDA 2003, pp. 3-33 to 3-35).

The Forest Service confines itself in a circular and self-reinforcing paradox in which fire exclusion is the only acceptable option because the effects of fire exclusion have made fire exclusion the only acceptable option. Watershed planning must recognize the significant and long-term costs of fire suppression, and strive to minimize the range of indirect and cumulative environmental impacts that result from it. Systematic fire exclusion puts the Ashland Creek watershed at severe risk of chemical and sediment pollution during required fire suppression operations (Backer et al. 2004) and prolonged susceptibility to very intense fires (USDA 1996a).

This proposal encourages the Forest Service to update its North Zone Mount Ashland LSR Fire Management Plan to empower line officers and incident commanders to use wildland fires along with appropriate fire suppression strategies in specified weather conditions and topographic settings. Fire Suppression should be tempered by opportunities for reintroduction of fire in mild weather conditions and favorable topographic locations when use of natural ignitions can benefit biota, conserve financial resources and protect worker safety. **The Ashland Forest Resiliency environmental impact statement (EIS) is an appropriate planning document to make this change.**

Wildland fire use restores key ecosystem functions

Uncontrolled wildland fires offer distinct advantages to the restoration of landscape structures altered by fire suppression because no other management option mimics the spatial patterning of natural fire effects (Baker 1994, 1989). Reintroduction of fire is critical to restore forest ecosystems because it supports natural, dynamic interactions between ecosystem structure and process (Kaufmann 2004, McIver and Starr 2001). Fire should be reintroduced at a landscape scale, thereby allowing natural ecological processes to shape ecosystem structure and composition over time. The most appropriate places to implement landscape-scale fire restoration treatments include roadless areas and large blocks of lightly roaded areas where risks to human life and property are low (DellaSala and Frost 2001). In the Ashland Forest Resiliency planning area, this would include all lands outside of the wildland-urban interface where intermix settlements do not exist.

The relatively short period of effective fire suppression in the Siskiyou Mountains (~50 years) and the similarity of fire severity patterns in recent wildland fire events compared to historical events argue for wider use of naturally-ignited fires in less-than-extreme weather conditions (DellaSala and Frost 2001, Frost and Sweeny 2000, Odion et al. 2004, Taylor and Skinner 1998). The Klamath NF concluded that most of the Dillon LSR met standards as functioning late-successional habitat after the 1994 Dillon Creek fire, suggesting that wildland fire use is compatible with biodiversity conservation (USDA 1996b).

Wildland fire use promotes safety and conserves financial resources

Use of naturally-ignited wildland fire to benefit resources and accomplish ecosystem management objectives promotes worker and public safety, and it conserves limited financial resources that otherwise could be devoted to large and inefficient suppression operations. The Report language in the FY 2005 Senate Interior Appropriations bill on hazardous fuels includes the following statement, which supports this proposal to amend the North Zone FMP:

> As a further method of reducing costs, the Committee strongly believes that the Forest Service should complete Fire Management Plans as quickly as possible, as provided in the agencies' Federal Wildland Fire Management Policy (1995). Fire Management Plans provide guidance on use of prescribed fire and other treatments, and response to naturally-ignited wildfires, taking into account the safety of nearby communities and ecological considerations. In particular, the Committee believes the Agency should, where appropriate, include Wildland Fire Use (management of naturally-ignited fires) in Plans, and implement Plans in a way that utilizes Wildland Fire Use, consistent with

safety and other concerns. The Committee recognizes that Wildland Fire Use often costs much less per acre than suppression, and may have significant forest health benefits. Agencies should also coordinate across Agency boundaries in developing Fire Management Plans, using the interagency Fire Program Analysis system.

REFERENCES

Agee, J.K. 1993. *Fire Ecology of Pacific Northwest Forests*. Island Press. Covelo, CA.

Agee, J.K., B. Bahro, M.A. Finney, P.N. Omi, D.B. Sapsis, C.N. Skinner, J.W. van Wagtendonk and C.P. Weatherspoon. 2000. The use of fuelbreaks in landscape fire management. *Forest Ecology and Management* 127: 55-66.

Agee, J.K., and M.H. Huff. 1986. Structure and process goals for vegetation in wilderness areas. Pp. 17-25 in: *Proc. Ntnl. Wilderness Res. Conf*. USDA For. Serv. Gen. Tech. Rep. INT-212. Boise, ID.

Arno, S.F. 2000. Fire in western forest ecosystems. Pp. 97-120 in: J.K. Brown and J.K. Smith (eds.). *Wildland Fire in Ecosystems: Effects of Fire on Flora*. USDA For. Serv. Gen. Tech. Rep. RMRS-42 vol. 2. Ogden, UT.

Atzet, T., and D.L. Wheeler. 1982. *Historical and ecological perspectives on fire activity in the Klamath Geological Province of the Rogue River and Siskiyou National Forests*. USDA For. Serv. R-6-Range-102. Portland, OR.

Backer, D.M., S.E. Jensen and G.R. McPherson. 2004. Impacts of fire suppression activities on natural communities. *Conservation Biology* 18: 937-946.

Baker, W.L. 1994. Restoration of landscape structure altered by fire suppression. *Conservation Biology* 8: 763-769.

_____. 1989. Effect of scale and spatial heterogeneity on fire-interval distribution. *Canadian Journal of Forest Research* 19: 700-706.

Betlejewski, F. Personal communication. September 14. Ashland Forest Lands Commission. Ashland, OR.

Brown, R. 2000. *Thinning, Fire and Forest Restoration: A Science-Based Approach for National Forests in the Interior Northwest*. Defenders of Wildlife. Washington, D.C.

Bunnell, D.L. 1995. Prescribed natural fire planning considerations: negotiating conflicting goals. Pp. 55-62 in: J.K. Brown, R.W. Mutch, C.W. Spoon and R.H. Wakimoto (tech. coords.). *Proc. Symp. Fire in Wilderness and Park Management*. USDA For. Serv. Gen. Tech. Rep. INT-GTR-320. Ogden, UT.

Carey, H. and M. Schumann. 2003. *Modifying Wildfire Behavior – The Effectiveness of Fuel Treatments: The Status of our Knowledge*. National Community Forestry Center Southwest Region Working Paper #2. Unpubl.

Chambers, M.S. and E.A. Duncan. 1995. Prescribed natural fire and air quality: identifying the real problem. Pp. 77-79 in: J.K. Brown, R.W. Mutch, C.W. Spoon and R.H. Wakimoto (tech. coords.). *Proc. Symp. Fire in Wilderness and Park Management*. USDA For. Serv. Gen. Tech. Rep. INT-GTR-320. Ogden, UT.

Chandler, G. 2002. Personal communication. February 19. USDI Bureau of Land Management Medford District. Medford, OR.

Cleaves, D.A. and J.D. Brodie. 1990. Economic analysis of prescribed burning. Pp. 271-282 in J.D. Walstad, S.R. Radosevich, and D.V. Sandberg (eds.). Natural and Prescribed Fire in Pacific Northwest Forests*. Oregon State Univ. Press. Corvallis, OR.*

DeBano, L. F., R. M. Rice and C. E. Conrad. 1979. Soil Heating in Chaparral Fires: Effects on Soil Properties, Plant Nutrients, Erosion and Runoff. USDA For. Serv. Res. Pap. PSW-145. Albany, CA.

Deeming, J.E. 1990. Effects of prescribed fire on wildfire occurrence and severity. Pp. 95-104 in: J.D. Walstad, S.R. Radosevich, and D.V. Sandberg (eds.). *Natural and Prescribed Fire in Pacific Northwest Forests*. Oregon State Univ. Press. Corvallis, OR.

DellaSala, D.A. and E. Frost. 2001. An ecologically based strategy for fire and fuels management in national forest roadless areas. *Fire Management Today* 61(3): 12-23.

DellaSala, D.A., D.M. Olson, S.E. Barth, S.L. Crane and S.A. Primm. 1995. Forest health: moving beyond rhetoric to restore healthy landscapes in the inland northwest. *Wildlife Society Bulletin* 23: 346-356.

Franklin, J.F., T.A. Spies, R. Van Pelt, A.B. Carey, D.A. Thornburgh and others. 2002. Disturbances and structural development of natural forest ecosystems with silvicultural implications, using Douglas-fir forests as an example. *Forest Ecology and Management* 155: 399-423.

Frost, E.J. and R. Sweeny. 2000. *Fire Regimes, Fire History and Forest Conditions in the Klamath-Siskiyou Region: An Overview and Synthesis of Knowledge*. Unpubl. report to World Wildlife Fund, Ashland, OR.

Graham, R.T., S. McCaffrey and T.B. Jain (tech. eds.). 2004. *Science Basis for Changing Forest Structure to Modify Wildfire Behavior and Severity*. USDA For. Serv. Gen. Tech. Rep. RMRS-120. Ft. Collins, CO.

Hardy, C.C. and S.F. Arno (eds). 1996. *The Use of Fire in Forest Restoration*. USDA For. Serv. Gen. Tech. Rep. INT-341. Ogden, UT.

Interagency Working Group (IWG) 2001. *Review and Update of the Federal Wildland Fire Management Policy and Program Review*. Boise, ID.

Kaufmann, J.B. 2004. Death rides the forest: perceptions of fire, land use, and ecological restoration in western forests. *Conservation Biology* 18: 878-882.

_____. 1990. Ecological relationships of vegetation and fire in Pacific Northwest forests. Pp. 39-52 in J.D. Walstad, S.R. Radosevich and D.V. Sandberg (eds.). *Natural and Prescribed Fire in Pacific Northwest Forests*. Oregon State Univ. Press. Corvallis, OR.

Keyes, C.R. and K.L. O'Hara. 2002. Quantifying stand targets for silvicultural prevention of crown fires. *Western Journal App. Forestry* 17: 101-109.

Lindenmayer, D.B. and J.F. Franklin. 2002. *Conserving Forest Biodiversity: A Comprehensive Multiscale Approach*. Island Press. Washington, D.C.

Martin, R.E. 1997. Fire as an integral component of Siskiyou ecology. Pp. 86-89 in: E. Jules and B. Snitkin (eds.). *Proc. Conf. on Siskiyou Ecology*, May 30-June 1: Kerby, OR. Siskiyou Regional Education Project. Cave Junction, OR.

Martin, R.E. and D.B. Sapsis. 1992. Fires as agents of biodiversity: pyrodiversity promotes biodiversity. Pp. 150-157 in H.M. Kerner (ed.). *Proc. Symp. on Biodiversity of Northwestern California*. Santa Rosa, CA: 28-31 Oct. 1991. Ctr. Wildland Res. Rep. No. 29. Univ. of California, Berkeley.

McIver, J. and L. Starr. 2001. Restoration of degraded lands in the interior Columbia River basin: passive vs. active approaches. *Forest Ecology and Management* 153: 15-28.

McMahon, T.E. and D.S. deCalesta. 1990. Effects of fire on fish and wildlife. Pp. 233-252 in J.D. Walstad, S.R. Radosevich, and D.V. Sandberg (eds.). Natural and Prescribed Fire in Pacific Northwest Forests. *Oregon State Univ. Press. Corvallis, OR.*

Odion, D.C. 2002. Chaparral and other shrub vegetation. Input to World Wildlife Fund Comment on Draft Resource Management Plan for the Cascade-Siskiyou National Monument. Unpubl.

Odion, D.C., E.J. Frost, J.R. Strittholt, H. Jiang, D.A. DellaSala and M.A. Moritz. 2004. Patterns of fire severity and forest conditions in the western Klamath Mountains, northwestern California. *Conservation Biology* 18: 927-936.

Parker V. T., and C. Rogers. 1988. *Chaparral Burns and Management: Influence of Soil Moisture at the Time of a Prescribed Chaparral Burn on the Response of the Native Vegetation from the Seed Bank.* California Department of Fish and Game. Sacramento, CA.

Parsons, D.J. and P.B. Landres. 1998. Restoring natural fire to wilderness: how are we doing? Pp. 366-373 in: T.L. Pruden and L.A. Brennan (eds.). *Fire in ecosystem management: Shifting the paradigm from suppression to prescription – Tall Timbers Fire Ecology Conf. Proc., No. 20*. Tall Timbers Res. Sta. Tallahassee, FL.

Rothermel, R.C. 1983. *How to Predict the Spread and Intensity of Forest and Range Fires*. USDA For. Serv. Gen. Tech. Rep. INT-143. Ogden, UT.

Ryan, K. 2003. Personal communication. September 24. USFS Fire Sciences Lab. Missoula, MT.

Sawyer, J.O., D.A. Thornburgh and J.R. Griffin. 1977. Mixed evergreen forest. Pp. 359-381 in: M.G. Barbour and J. Major (eds.). *Terrestrial Vegetation of California*. John Wiley and Sons. New York.

Shelby, B. and R.W. Speaker. 1990. Public attitudes and perceptions about prescribed burning. Pp. 253-260 in: J.D. Walstad, S.R. Radosevich, and D.V. Sandberg (eds.). *Natural and Prescribed Fire in Pacific Northwest Forests*. Oregon State Univ. Press. Corvallis, OR.

Stephens, S.L. 1998. Evaluation of the effects of silvicultural and fuels treatments on potential fire behavior in Sierra Nevada mixed-conifer forests. *Forest Ecology and Management* 105: 21-35.

Sweeney, J. R. 1956. Responses of vegetation to fire. *University of California Publications in Botany* **28**:143-250.

Taylor, A.H. and C.N. Skinner. 1998. Fire history and landscape dynamics in a late-successional reserve, Klamath Mountains, California, USA. *Forest Ecology and Management* 111: 285-301.

USDA Forest Service. 2003. *Upper Bear Ecosystem Assessment*. Rogue River National Forest. Medford, OR.

_____. 2001. *Ashland Watershed Protection Project Final Environmental Impact Statement*. Rogue River National Forest. Medford, OR.

_____. 1996a. *Mount Ashland Late-Successional Reserve Assessment*. Rogue River and Klamath National Forests. Medford, OR, and Yreka, CA.

_____. 1996b. *Dillon Late-Successional Reserve Assessment*. Klamath National Forest. Yreka, CA.

USDI Bureau of Land Management. 1998. *Fire Management Plan*. Medford District. Medford, OR.

US General Accounting Office (GAO). 2001. *The National Fire Plan: Federal Agencies Are Not Organized to Effectively and Efficiently Implement the Plan.* Testimony Before the Subcommittee on Forests and Forest Health, Committee on Resources, House of Representatives. GAO-01-1022T. Washington, D.C. July 31.

van Wagtendonk, J.W. 1996. Use of a deterministic fire growth model to test fuel treatments. In: *Status of the Sierra Nevada: Sierra Nevada Ecosystem Project, Final Report to Congress, Vol. II, Assessment summaries and management strategies*. Ctr. Wildland Res., Univ. of California, Davis.

Weatherspoon, C.P. 1996. Fire-silviculture relationships in Sierra forests. In: *Status of the Sierra Nevada: Sierra Nevada Ecosystem Project, Final Report to Congress, Vol. II, Assessment summaries and management strategies*. Ctr. Wildland Res., Univ. of California, Davis.

Appendix 8.5 AFR GIS Data Analysis grid

Category 1 Fire Resilient		**Category 2** Easily Made Fire Resilient		***Category 3*** Geographically, Ecologically, Logistically [suppression] & Politically Strategic Connections	
Within Public Lands (USFS) [21639.49 Acres]		Within Public Lands (USFS) [21639.49 Acres]			
Grid No / Total Acres	Description *Data Source*	**Grid No** / Total Acres	Description *Data Source*	**Grid No** / Total Acres	Description *Data Source*
1	Prior Treatment Prior underburns "treatment need TBD" *grid1_priorunderburn.shp*	**8** 1979.04	Pine (Predominant sp) buffered 30M PAG 1,2,3,4,5,8 Upper 2/3 slopes Not (sum of Category 1) Not LHZ 1 or 2 Not >65% Not spotted owls *grid8_pine.shp*	**13** 1196.18	City Interface Zone PAG 1,2,3,4,5,8 Any slope Any aspect Not (sum of Category 1) except allow RR4 Not (sum of Category 2) Not LHZ 1 (allow LHZ 2) Not >75% Not spotted owls [WUI1 *wui-1.shp* 1419.33 acres] [WUI2 *wui-2.shp* 2213.46 acres] [WUI3 *wui-3.shp* 3838.95 acres] *grid13.shp*
2 277.63	Prior Treatment Fuel break "treatment need TBD" *grid2_fuelbreak.shp*	**9** 1213.19	PAG 1,2,3,8 Upper 2/3 intersect S&W slopes Not (sum of Category 1) Not LHZ 1 or 2 Not >65% Not spotted owls Not Grid8 *grid9.shp*	**14** 166.89	Plantations\Managed Same exclusions as above Less Grid 13 *[grid14_managed 1159.14 acres]* *grid14.shp*
4 1954.46	Awpp alt6 *grid4_awpp.shp*	**10** 401.83	PAG 1,2,3,8 Upper 1/3 intersect N&E slopes Not (sum of Category 1) Not LHZ 1 or 2 Not >65% Not spotted owls Not Grid8 Not Grid9 *grid10_u1_ne.shp*	**15** 147.65	USFS Roads buffered 100' PAG 1,2,3,8 Not (sum of Category 1) Not (sum of Category 2) Not (sum of Category 3 above) *grid15.shp*
5 4739.61	Riparian Areas+ 50' (RR4 as surrogate) *grid5_rr4.shp*	**11** 410.67	PAG 4,5 Upper 1/3 intersect S&W slopes Not (sum of Category 1) Not LHZ 1 or 2 Not >65% Not spotted owls Not Grid8 Not Grid9 Not Grid10 *grid11_u1_45.shp*	**16** 1529.47	Corridors Intersect 200' buffer of riparian areas +50' (RR4 as surrogate), ¼ mile buffer around ¼ mile NSO with 200' buffer of all treatments Not (sum of Category 1) Not (sum of Category 2) Not (sum of Category 3 above) Clipped to PAG 1,2,3,4,5,8 *Clipped2Pag_Grid16 shp*

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

6 485.80	Seral Stage 6 & 7 TPA 1 & 2 combined < 50 >= 5 Acres contiguous *grid6_seral7.shp*	**12** 863.31	PAG 4,5 Upper 1/3 intersect N&E slopes Not (sum of Category 1) Not LHZ 1 or 2 Not >65% Not spotted owls Not Grid8 Not Grid9 Not Grid10 Not Grid11 *grid12.shp*	**17** 1795.76	¼ mile NSO buffers Clipped to PAG 1,2,3,4,5,8 *Clipped2Pag_Owls*
7 335.91	Natural openings: exposed soil, rock, prairie, forb/herbac, water *grid7_naturalopen.shp*			**18** <900	Riparian Areas previously logged Clipped to PAG 1,2,3,4,5,8 *Clipped2Pag_RR4.shp*
8928.77	← Individual Layer Totals	4868.04	← Individual Layer Totals	<5736	← Individual Layer Totals
8924.06	← Unioned Layer Totals *Category1total.shp*	4868.0 4	← Unioned Layer Totals *Category2total.shp*		

Appendix 8.6: Ashland Forest Resiliency Community Alternative Monitoring

Monitoring is a key aspect of project implementation and understanding. The AFCRA process stands to benefit greatly from lessons learned during and after implementation of the Ashland Watershed Protection Project. We urge the Forest Service to devote and seek out funding to implement the monitoring plan in the AWPP Record of Decision. To the degree that the City and community can partner to accomplish this, we are willing. The AWPP can serve as a living laboratory for learning given that the ecological conditions are replicated in many spots where the AFCRA proposes treatments. This information will be invaluable to decision-making and implementation of the larger project.

It is imperative that efforts not be duplicated during implementation and monitoring of the AFR/AFRCA project, regardless of the plan selected. Data gathering and ground truthing done during the preparation and implementation phases of AFR or AFRCA should contribute in some way toward monitoring at a later date.

This monitoring section is largely taken from the Ashland Watershed Protection Project final document. It has been modified to reflect the Ashland Forest Resiliency Community Alternative project. Thanks to all persons who contributed to the AWPP and AFCRA monitoring efforts.

An important addition to monitoring under this project is an inclusion of ecological trend monitoring by the Klamath Bird Observatory (KBO). The Klamath Bird Observatory will integrate an Ashland Watershed ecological monitoring effects project with its region-wide Joint Fire Sciences research and monitoring program. This effort will: 1) meet the Healthy Forests Initiative and Healthy Forests Restoration Act (HFRA) requirements to monitor the results of authorized hazardous-fuels reduction projects by establishing a collaborative multiparty monitoring, evaluation, and accountability process to assess the positive and/or negative ecological effects of fuel-reduction projects; and 2) contribute to HFRA reporting requirements by providing an evaluation of and recommendations for the project goals as they relate to National Fire Plan and National Bird Conservation Plan objectives. The KBO has received approval for partial funding of this project from the Rogue-Umpqua RAC for FFY2005.

Modifications were also made to the soils monitoring section. Soils monitoring is an extremely important yet often overlooked phase of project implementation.

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us

Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

I. INTRODUCTION

Monitoring, the periodic measurement or observation of a process or action, must be an integral part of land management. Monitoring to assess the effects of human generated actions and natural events such as flood, epidemic, fire, and wind, allows for development of land use practices that are more compatible with conservation of biodiversity and attainment of forest health. Conversely, management practices that threaten health and biodiversity can be altered or curtailed. This process of closely linking management planning with monitoring is an important aspect of Adaptive Management.

The overall goal for the management of the Ashland Creek Watershed is to continue to provide high quality drinking water for the City of Ashland, and to maintain large areas of late-successional habitat by creating a landscape that is relatively resistant to large-scale stand replacing wildfires. The *Final Environmental Impact Statement* (FEIS) includes analysis and disclosure of the proposal to manage vegetation within the Upper Bear area and addresses the underlying Purpose and Need for the Forest Service action. This Monitoring Plan is developed as an iterative tool for assessing whether watershed management is achieving its overall goals and objectives of achieving watershed health.

This plan establishes monitoring objectives and protocol for implementation, baseline, effectiveness, validation, and trend monitoring.

Implementation monitoring will track the project through layout, contract preparation, during and immediately following project implementation, to ensure that it is implemented as planned. This asks, "Did we do what we said we were going to do as outlined in the Record of Decision (ROD)?"

Baseline monitoring will be carried out in conjunction with effectiveness monitoring. Baseline data will be collected prior to project implementation to characterize the existing conditions specifically for comparison to post project conditions and will provide a basis for effectiveness monitoring.

Effectiveness monitoring will determine if the project activities were effective in achieving the stated goals and objectives based on comparison of pre (baseline) and post project conditions. Effectiveness monitoring asks, "Was the result of the project as we had planned?"

Validation monitoring determines if certain assumptions and data used in the development of this project were valid.

Trend monitoring is designed to detect changes over time, and is useful for assessing how management activities occurring throughout the watershed are affecting (positively or adversely) landscape or watershed scale processes.

The lessons learned from monitoring and data collection will be useful for modifying project plans to better meet watershed goals and objectives. If monitoring indicates laws, regulations, standards or critical objectives are not being met, the project will be modified as necessary and appropriate.

Another important concept incorporated into this Monitoring Plan is **natural resource education** opportunities for interested community members, students, and educators. It is anticipated that as monitoring is conducted, opportunities will be available for volunteer participation in data collection and analysis, communication of results, and continued development of monitoring goals and objectives. Field trips, presentations, and workshops will be scheduled to communicate progress and project monitoring results. Progress and results will also be made available through newsletter updates and posted on the Rogue River National Forest Internet website (www.fs.fed.us/r6/rogue).

II. IMPLEMENTATION MONITORING

Implementation monitoring asks the question, did we implement the project as outlined in the ROD, including consistency with land allocations guiding the implementation of management activities in the Project Area? The following specific evaluation questions will be used to complete implementation monitoring:

Evaluation Questions

1) Were treatments implemented according to design criteria including appropriate mitigation measures and management constraints outlined in the Record of Decision and associated listing of Mitigation Measures and Management Requirements? If implementation deviated from design criteria and mitigation measures, document how and why implementation deviated and whether the desired objectives as documented in the FEIS were achieved.

2) Were fire hazard reduction treatments implemented according to treatment prescription, treatment method, and as scheduled in the Record of Decision?

- ☒ How many acres were planned for implementation by treatment method, by fiscal year?
- ☒ How many acres were treated by treatment method, by fiscal year?

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

Approach

Table 1 will be used to track important checkpoints, comments, accomplishments and needs based on the Community Involvement Strategy identified in the Record of Decision (ROD page 11). This includes items such as field trips, workshops, development of silvicultural prescriptions, marking guides, unit layout, tree marking, and contract implementation.

Table -1. Implementation Tracking Chart – Community Involvement Strategy

COMMUNITY INVOLVEMENT STEPS	Check Point	Check Point	Check Point
Conduct meetings with various groups and neighborhoods upon request to discuss the Decision, address concerns and questions, and identify opportunities for continued involvement through implementation.			
Complete public notification as various aspects of the project are to begin.			
Scheduled workshop/meetings to present and discuss implementation and effectiveness monitoring plans.			
Make the Implementation Monitoring Chart available on RRNF Internet website.			
Schedule and conduct field reviews for representative units when manual and/or underburning treatments have been completed.			
Notify public with results of monitoring for pre project as well as post project conditions.			
Schedule and conduct monitoring workshop for volunteers; identified units for volunteer monitoring.			
Schedule and conduct volunteer days in selected units for community participation in data collection for monitoring.			
Schedule and conduct volunteer days for community participation in manual fire hazard reduction treatments.			
Schedule and conduct volunteer work days for demarking trees previously marked within units dropped from mechanical treatments.			
Make final prescriptions available prior to the implementation of tree marking in units planned for mechanical treatments.			
Notify public when tree marking is complete; opportunities will be announced for field review (either scheduled field trips or self guided review).			

III. EFFECTIVENESS MONITORING

Effectiveness monitoring will determine if the project activities were effective in achieving the stated goals and objectives based on comparison of pre (baseline) and post project conditions. Effectiveness monitoring asks, was the result of the project as we had planned? Effectiveness monitoring is closely tied to Baseline monitoring. Baseline data will be collected prior to project implementation to characterize the existing conditions specifically for comparison to post project conditions and will provide a basis for effectiveness monitoring.

A. Maintenance and Development of Forest Resiliency

Introduction

Across the landscape the Ashland Watershed has missed 3 to 9 fire cycles as a result of fire exclusion. The effects are varied according to aspect, slope position and elevation. In the drier sites, vegetation has changed from more open conditions, composed of fire-adapted species, to dense overstocked forest stands with an increase in shade-tolerant and fire-intolerant species. Riparian areas have changed the least but can be problematic especially in uplands. Continuous horizontal and vertical vegetation in dense stands can act as fuel ladders allowing wildfire to spread from the forest floor to the canopies of trees. Inter-tree competition for moisture and nutrients causes forested stands to self-thin leading to an increase in dead and down fuel loads. The chance for a large-scale high severity wildfire has increased dramatically since effective fire suppression began as structure and composition of watershed vegetation has changed from more open to very dense forest conditions.

The Ashland Forest Resiliency Community Alternative outlines management strategies for reducing fire hazard in Upper Bear Creek and reducing the threat of large-scale high severity wildfire for the purpose of safeguarding the quality and quantity of water delivered from Ashland's Municipal Watershed, as well as for managing long-term late-successional and old-growth forest environments.

The goal of the AFRCA project is to return the forest to a more resilient state where the re-introduction of fire as an ecosystem process is possible through restoration of landscape-scale fuel discontinuity according to ecological site conditions. The discontinuity of understory fuels and overstory density are seen as a way to control fire intensity and spread as well as provide logistical opportunities for fire use.

It is strategic to maintain the presence of fire-adapted species throughout the watershed. The management of forest composition to maintain higher proportions of fire adapted and/or fire resistant species such as ponderosa pine, sugar pine, incense cedar, Pacific madrone, black oak and Douglas-fir would contribute to a forest that would be relatively resilient to fire. The maintenance of species that quickly take over a site after fire is important as well. These species tend to hold the soil and stabilize the site, and inhibit the colonization of non-native species.

Another important factor in management of vegetation for creating and maintaining a fire safe/fire resilient forest is the extent and arrangement of fuels in the Watershed on a landscape basis. It is important to manage vegetation in areas that would provide the greatest protection given the high fire risk (high values and high probability of fire ignition).

Evaluation Questions

1) Have Ashland Forest Resiliency Community Alternative fire hazard reduction activities reduced the potential large-scale, high-intensity disturbance?

- ☒ Were surface fuels reduced, as measured by **change in tons per acre** of downed woody debris by diameter class (0 to 2.9 inch, and 3 inches plus)?

- ☒ Were ladder fuels reduced and crown base heights increased, as measured by **change in percent cover of understory vegetation** (small conifers and shrubs), and **change in crown base height—**the distance from ground level to the lower branches of the trees forming the main canopy of the forest stand? (change in crown base height measured for permanent plots only).

2) Have Ashland Forest Resiliency Community Alternative fire hazard reduction activities reduced the potential for crown fire spread?

- ☒ Were crown fuels reduced as measured by change in basal area and percent cover of trees forming the main forest canopy?

- ☒ Are forest stand conditions composed of fire-adapted and fire resistant species being maintained or encouraged as a result of Ashland Forest Resiliency Community Alternative project activities?

- ☒ What is the **change in proportions of fire adapted/resistant tree species** in forest stands treated, specifically ponderosa pine, sugar pine, incense cedar, and Douglas-fir, Pacific madrone and black oak?

- ☒ What is the **change in proportions of fire adapted shrub and herbaceous species**, specifically native species characterized as rapid colonizers following disturbance, species that dampen fire effects (higher moisture content and lower volatile oils)?

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

- Some of the resilient species that are fire adapted and quickly sprout, seed, or germinate in response to fire are: *Pinus ponderosa, Pinus lambertiana, Ceanothus integerrimus, Ceanothus prostrates, Arbutus menziesii, Quercus kelloggi, Calocedrus decurrens, Arctostaphylos patula, Arctostaphylos nevadensis, Rhus diversiloba, Ceanothus velutinus , Arctostaphylos viscida.*

☒ Are fire hazard reduction treatments maintaining or improving tree vigor within forest stands treated, as measured by **increase in diameter growth and maintenance or increase in crown ratios (portion of the tree with live crown).**

☒ At the landscape scale, is fire hazard being reduced in the highest risk areas and areas that would provide the greatest protection for high value resources?

☒ How many acres and what proportion of moderate, high, and extreme fire risk areas were treated?

Approach

The Natural Resources Information System Field Sampled Vegetation (FSVeg) Module is a database, data collection system, and set of reporting tools. It is designed to implement corporate data standards and promote effective sharing of Field Sampled Vegetation information, which includes data about cover, fuels, trees, and understory layers. Vegetation examinations using the Common Stand Exam (CSE) protocols and field procedures described in the Common Stand Exam Field Guide for Region 6, version 1.4.1 will be used to populate the database and conduct baseline and effectiveness monitoring. These protocols are consistent with the FSVeg database attribute standards.

☒ Delineate (or stratify) forest stands within units so that stands sampled have fairly uniform stand characteristics. Select stands representative of the various stand types, elevations, and aspect for establishing permanent plots, to allow long-term (10 to 20 years) monitoring from the same vantage point. For all stands collect data pre and posttreatment.

☒ Use a nested plot sample design to collect variable plot data for trees 5 inches diameter and larger (intensive plot exam design); collect fixed plot ($1/100^{th}$ acre) data for trees less than 5 inches diameter and at least 6 inches in height; and collect data for $1/5^{th}$ acre fixed plot estimating percent cover by species, life form (woody tree, woody shrub, forbs, grasses), and vegetation layer (lowest, mid, or highest level). Use Forest Simulator Model for analyzing data collected.

☒ Conduct photo monitoring as a minimum for permanent plots. Protocol to be further developed based on Draft Photo Point Monitoring Handbook (Hall 2000), and Draft Ground Based Photographic Monitoring (Hall 1999).

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

At each stand exam plot location, install one or two 50-foot transects according to protocol outlined in Handbook for Inventorying Downed Woody Material, USDA Forest Service General Technical Report INT-16 (Brown 1974). An average of 10 to 12 transects are needed for each stand.

Data Analysis and Storage

Vegetation data will be stored in the Natural Resources Information System Field Sampled Vegetation (FSVeg) is a database. Data will be analyzed using the vegetation simulation module. Coarse woody material (fuels) data will be stored and analyzed using an Excel spreadsheet program developed for use with Brown's Protocol and/or using the Common Stand Exam Program.

B. Soil Conditions

Introduction

The Project Area has been rated as severe to very severe soil erosion potential on steeper slopes and moderate potential on gentler slopes (Badura and Jahn 1977). These are qualitative terms describing the degree of surface soil erosion that could take place during intense storm events if the mineral soil is exposed (not protected by duff or ground vegetation). For the AFRCA project it will be essential to establish definitions of "steeper" and "gentler" slopes. Of equal importance is the erosion rating hazard for each vegetative condition.

Detrimental soil conditions can be expected to occur as a result of implementing the Ashland Forest Resiliency Community Alternative project. The degree, extent, and duration of resultant detrimental soil conditions within each activity area influence the magnitude of productivity loss associated with any alternative. **Degree** refers to the magnitude of change in soil properties such as increase in bulk density or decrease in macroporosity and the depth to which those changes occur. **Extent** refers to the area affected by such changes. **Duration** refers to the length of time such changes may persist on a site. We need to establish a duration which is acceptable given site conditions. This will differ in each soil/landtype condition taking into account the potential cumulative effects of future projects and upslope activities.

The Pacific Northwest Region (Region 6 or R6) has developed several policy standards for permitted amounts of detrimental soil conditions within activity areas. The policy standards are contained in Forest Service Manual 2500 - R6 Supplement, 2500-98-1 and include definitions for what constitutes soil damage and how to assess soil quality conditions and trends. These are not targets, but maximums that should not be hit if at all possible.

Standards stated in the R6 Supplement direct that the area resulting in detrimental soil conditions from new management activities will not exceed 20 percent of an activity area (a treatment unit) which includes the permanent transportation system. The Rogue River National Forest Plan has set more restrictive standards for soil compaction and surface erosion directing that no more than 10 percent of an activity area will be compacted, puddle, severely burned, or displaced upon completion of a management activity, and a maximum of 20 percent considering previous management activities. R6 soil quality standards classify an increase in bulk density of more than 15 percent at 4 to 12 inch soil depths as **detrimental soil compaction.**

Activities that can produce **detrimentally burned soils** include wildfires and all types of prescribed fire (swamper burning, hand pile and burning, and prescribed underburning. Swamper burns, handpiling and burning, and burning logs in prescribed underburns create small, unconnected areas of exposed and burned soils. The burn pile areas are generally less than 100 square feet, and by R6 soil quality standards, not considered large enough to be classified as detrimentally disturbed. For the purposes of the AFRCA, we need to define burn pile standards for each unit and soil type. Factors such as overall square footage, slope, and burn pile location are as important as an overall area limit. In prescribed underburning units, soils can be detrimentally burned beneath hotspots (places where fire burned at higher intensities due to the higher accumulation of fuels) or smoldering coarse woody debris. Regional soil quality standards consider soils to be detrimentally burned when the mineral soil surface has been significantly changed in color (oxidized to a reddish color), and the next one-half inch is blackened from organic matter charring by heat conducted through the top layer on an area greater than 100 square feet and a width of 5 feet. Soils with portions of a duff/litter layer intact have not been heated to the extent that is classified as detrimentally burned. Again, area wide determination of soil impact is important. Severely burned areas should not take up more than 10% of the unit area to maintain site quality.

Detrimental **surface erosion** has been defined in the R6 soil quality standards as the visual evidence of surface loss in areas greater than 100 square feet; the presence of rills or gullies; and/or water quality degradation from sediment or nutrient enrichment. The standards go further by stating that to meet acceptable levels of soil loss and soil management objectives, the minimum percent effective ground cover following cessation of any soil-disturbing activity should be 60 to 90 percent on very high (very severe) erosion hazard class soils and 45 to 60 percent for moderate erosion hazard classes the first year after disturbance. After the second year, the effective ground cover should be 75 to 90 percent for soils with very high erosion ratings and 40 to 60 percent for moderate ratings. For this project, the standards for minimum effective ground cover is 85 percent as stated in the Rogue River National Forest Plan.

Prescribed underburnings can increase the amount of exposed mineral soil; however, the degree and extensiveness of soil exposure are governed by several factors: the amount and type of fuels; characteristics of the fire; and the fuel, duff, and soil moisture contents at the time of the fire. Duff moisture content, especially that in the lower one-half of the duff, is the most important determinant of duff consumption (Sandburg 1980). In a series of underburning experiments under stands of Douglas-fir in Western Oregon and Washington, Sandburg found that the moisture content of the duff layer and large wood at the time of the prescribed burn correlated well to the amount of mineral soil exposed after the fire. The relationship he found was the higher the duff and fuel moistures, the less mineral soil was exposed. Fuel managers use this relationship to determine when and how to burn a site to maintain a prescribed amount of duff cover. Presence of soil moisture can further reduce the amount of bare soil exposed (Frandsen and Ryan 1986).

Impacts to soils can be minimized through project design and mitigation measures, which are documented in the Ashland Forest Resiliency Community Alternative project FEIS and Attachment B of the Record of Decision.

Evaluation Questions

1) How effective was project design including mitigation measures in minimizing soil impacts and meeting Regional and Forest Standards and Guidelines for soil protection.

☒ What is the increase in area of detrimental soil compaction within units treated with ground-based yarding systems, and what proportion of the treatment unit are soils detrimentally compacted? What is the overall impacted area including compaction, severely burned, or displaced?

☒ Is 85 percent effective soil cover being maintained in treatment units?

☒ What percent of the treatment areas resulted in detrimentally burned soil conditions?

Approach

To assess the changes in soil cover resulting from project activities, install a 100-foot transect along with each vegetation exam plot, collect the following data:

Bare Soil: For each 10-foot interval, measure the amount of bare soil encountered beneath
the tape, measure the extent in feet to the nearest 1/10.

Bare Rock: For each 10-foot interval, measure the amount of bare rock encountered beneath
the tape, measure the in feet to the nearest 1/10.

Litter Only Cover: For each 10-foot interval, measure the amount of litter

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

only cover encountered beneath the tape, measure the extent in feet to the nearest 1/10.
Live Vegetation Cover: For each 10-foot interval, measure the amount of live vegetation
encountered beneath the tape. Only include vegetation with dense mat forming characteristics with soil contact (mosses, ground covers, low mat forming woody shrubs).
Measure the extent of live vegetation in feet to the nearest 1/10.

Duff Cover: For each 10-foot interval, measure the amount of duff cover encountered beneath the tape, measure the extent in feet to the nearest 1/10.

Duff Depth/Litter Depth: At each 10-foot interval, measure the duff depth (from top of
mineral soil to bottom of litter cover) and litter depth (from top of duff to top of litter) to the
nearest 1/10 inch.

Burned soil: For each 10-foot interval, measure the amount of burned soil encountered
beneath the tape, measure the extent to the nearest 1/10.

Additionally, **Prescribed Fire Plans**, also referred to as **Burn Plans**, must be completed prior to a planned fire ignition and approved by the District Ranger. Prescribed Fire Plans guide the implementation based on site-specific unit conditions (including fuel moisture and weather conditions) at the time of planned ignition and will incorporate Mitigation Measures from ROD Attachment B, Table B - 2 for soil protection. Prescribed fire plans also provide for pre- and post-burn evaluation to monitor if the burn was carried out as planned and its effectiveness at meeting resource objectives. The Prescribed Fire Plan is an important tool for ensuring that project goals and objectives are met in a safe and carefully controlled manner. Forest Service Manual (FSM) 5140 provides direction for Burn Plan preparation.

Data Storage and Analysis

Data collected for soil conditions will be stored and analyzed using Excel spreadsheet program. Prescribed fire plans provide a more informal ocular estimate of pre and post project conditions and will be stored as text documents electronically and hard copy.

C. Water Quality, Hydrologic Function, and Aquatic Resources

Introduction

The greatest concern for impacting water quality, hydrologic function, and aquatic habitat is associated with accelerating erosion and sedimentation to streams. Ground disturbing activities associated with planned fire hazard reduction activities will increase the potential for surface erosion and sediment production during and for 1 to 2 years following implementation. The potential for increased sedimentation will taper off once ground cover and vegetation is reestablished. Monitoring described above under Soil Conditions will determine the effectiveness of project design in maintaining protective soil cover.
Mitigation measures (ROD Attachment B, Table B-2) are required during project implementation to avoid impacts altogether or minimize potential impacts to water quality, hydrologic function and aquatic resources. Implementation monitoring described above will track the implementation of mitigation measures, while this section is designed for monitoring the site-specific effectiveness of mitigation as it is implemented. Trend monitoring described below will use a water condition indicator and channel morphology indicator to evaluate over time how watershed management is affecting water quality, hydrologic function and aquatic resources.

Evaluation Questions and Approach

In conjunction with site visits by contract administrators and resource specialists, conduct photo monitoring to document on site application of mitigation measures. Organize filing system on district for storing of photo series along with other information (reports, field notes, etc.)

D. Late-Successional Reserve Integrity

Introduction

Late-Successional Reserves are designated as areas to be managed to protect and enhance late-successional and old-growth forest ecosystems. A network of Late-Successional Reserves are designated across the range of the northern spotted owl to maintain long-term connectivity of late-successional and old-growth forest ecosystems, which serve as habitat (including migratory and dispersal) for late-successional and old-growth forest related species. The Northwest Forest Plan recognizes the need to manage disturbance risks in the Oregon and California Klamath Province. Silvicultural systems proposed in reserves for the objectives of reducing their susceptibility to stand replacing fires may be appropriate. “Compartmentalized landscape units of reduced fuel allow safe access for fire suppression crews and provide strategic locations for efficient and effective fire suppression. Stands are manipulated to reduce continuity of canopies, boles are pruned on residual trees, and significant quantities of understory fuels are removed.” (USDA/USDI, 1994 p. B7-B8). Many of these treatments may reduce the quality of habitat for late-successional organisms, and a balanced approach to reduce the risk of fire while protecting larger areas of fire-prone late-successional forest must be sought

(USDA/USDI, 1994 p. B7-B8).

As required by the Northwest Forest Plan, a Late-Successional Reserve Assessment (LSRA), including a Fire Management Plan, was completed prior to planning for vegetation manipulation activities within the Mt. Ashland Late-Successional Reserve. Regional Ecosystem Office (REO) review of the LSRA was completed and documented in a September 30, 1996 memo (FEIS, Appendix B), exempting this project from further REO project level review. The Mt. Ashland LSRA documents desired conditions for compositional and structural characteristics for the Mt. Ashland Late Successional Reserve (USDA 1996 p. 15).

While vegetation management activities authorized under the Ashland Forest Resiliency Community Alternative project for the purpose of hazardous fuels reduction may reduce the quality of late successional habitat, it is anticipated that overall forest structure and composition will be maintained within the ranges identified in LSRA desired composition and structural characteristics. Monitoring is needed to determine how effective project design criteria are in developing or maintaining desired habitat characteristics.

Evaluation Questions

1) What is the change in structural and compositional forest stand characteristics, as determined by the following analysis indicators?

- ☒ Average tree diameter in forest stands treated;
- ☒ Percent cover of vegetation by forest layer (forest floor, understory, and overstory), by species;
- ☒ Number of snags per acre by species, diameter class, height, and decay class;
- ☒ Basal area per acre (the measure of the number of square feet occupied by tree stems);
- ☒ Coarse woody material as measured by tons per acre and pieces per acre in specific size and decay classes.

Approach

The approach detailed under section III, A, Maintenance and Development of a Fire Safe Forest uses the Common Stand Exam (CSE) protocols and field procedures described in the Common Stand Exam Field Guide for Region 6, version 1.4.1. Transects according to protocol outlined in Handbook for Inventorying Downed Woody Material, USDA Forest Service General Technical Report INT-16 (Brown 1974) are being collected to provide data on coarse woody material.

- ☒ Complete analysis of pre and post project vegetation data to determine changes in vegetation composition and structure (including snags).

- ☒ Complete analysis of coarse woody material transect data (pre and post project conditions) to determine changes in levels of coarse woody material.

Data Analysis and Storage

Vegetation data will be stored in the Natural Resources Information System Field Sampled Vegetation (FSVeg) is a database. Data will be analyzed using the vegetation simulation module.

Coarse woody material (fuels) data will be stored and analyzed using an Excel spreadsheet program developed for use with Brown's Protocol and/or using the Common Stand Exam Program.

E. Non-native plant Management

Introduction

Non-native plants are a serious concern in the watershed, especially where ground disturbance will create ample opportunities for non-native introduction and establishment. Non-natives have had extremely negative effects on grassland ecosystems, changing fire frequency and species composition (Brooks et al, 2004).

. MATTHEW L. BROOKS,
July 2004 / Vol. 54 No. 7 • **BioScience 679**

Evaluation Questions

1.) Has the presence and extent of noxious weeds increased

Public Works
20 E. Main Street
Ashland, Oregon 97520
www.ashland.or.us
Tel: 541/488-5587
Fax: 541-/488-6006
TTY: 800/735-2900

due to the implementation activities?

- ☒ Map extent of all noxious weed populations and monitor # of individuals, reproducing individuals.
- ☒ Propose mitigation measures for all known and new populations. Monitor population trends after treatments.

Approach
Map invasive weeds and enter population locations and descriptions into a GIS database. Treatment of noxious weed populations is required within 250 feet of treatment prior to new disturbance. Plan entry routes to avoid weed patches. Routinely require vehicle and equipment washing for contractors working in the watershed. Post-treatment monitoring is required to detect the spread of existing or invasion of new noxious weed populations. A spreading or a new population shall be treated so it can be controlled or eliminated.

Literature Cited

BROOKS, MATTHEW L. et al. ***BioScience*** *Vol. 54 No. 7 July 2004.*

IV. VALIDATION MONITORING

Validation monitoring is designed to determine if certain assumptions and data used in the development of the project are valid, or if they need adjustment for goal attainment.

A. Delayed Bark Beetle Mortality in Ponderosa and Sugar Pine

Introduction

Some amount of delayed bark beetle caused mortality of large ponderosa and sugar pine can be expected as a result of prescribed underburning. In the absence of fire, substantial mounds of decomposed needles and exfoliated bark scales (bark chip mounds) develop around the bases of pine trees. The width and depth of these bark chip mounds increase with time since the last fire, and tend to be the greatest around the larger trees. When fire is prescribed for stands where older pines are present, the duff layers around the bases of the trees can smolder. If high temperatures are maintained for a long time around the base of the trees, considerable amounts of cambium at the root collar can be killed. This can be particularly damaging if prolonged heating coincides with active cambial growth. Many large pines also produce fine rootlets that grow into duff layers; these can be killed or damaged when the duff layer burns. Investigators have found that some pines injured as a result of smoldering duff piles die two to four years after the burn due to western pine beetle, mountain pine beetle, red turpentine beetle, and/or pine engraver infestation (Flanagan 1996, Harrington and Sackett 1992, Ryan 1990, Ryan and Frandsen 1991, Swezy and Agee 1990, Thomas and Agee 1986).

Existing research literature on delayed pine mortality indicates that pine losses associated with prescribed fire are lowest where the fire duration is as short as possible and duff mounds are as wet as possible at the time when the fire occurs. Research examining the timing of spring burns in May through June, report 10 to 38 percent delayed pine mortality. Other investigations suggest that raking bark chip mounds away from the base of pines two years prior to prescribed underburning may reduce adverse effects of underburning on large pines.

Evaluation Questions

- ☒ What is the rate of mortality of large ponderosa and sugar pine in stands treated with prescribed underburning?
- ☒ How does the mortality rate compare to untreated stands (control).
- ☒ Does raking 2 years prior to prescribed underburning noticeably reduce the rate of large pine mortality resulting from underburning and subsequent bark beetle activity?

Approach

Establish plots within selected sample of prescribed underburning units; include treatment units with various combinations of treatment methods (mechanical treatments, prescribed underburning only, manual treatment followed by prescribed underburning, etc.), at various elevations and aspects.
For comparison, establish plots in untreated areas as controls. Track bark beetle infestation over the next 20 years. A proportion of pines will be selected for raking. to remove extra fuel from base of pines for protecting the fine roots. Raking will be conducted 2 years prior to underburning.

The Southwest Oregon Forest Insect and Disease Service Center will prepare an establishment report detailing the approach and objectives for monitoring delayed bark beetle mortality, and will begin installation of plots in spring 2001.

B. Effect Of Douglas-Fir Dwarf Mistletoe Infection On Survival Of Douglas-Fir Trees Following Prescribed Underburning.

Introduction

Dwarf mistletoe infection increases ladder fuels in the crowns of infected trees and the concentration of ground fuels around the base, resulting in more severe fire behavior (Hawksworth and Wiens 1996). Research in southwestern ponderosa pine has shown that heavily infected trees had lower probability of survival after burning than healthy trees (Harrington and Hawksworth 1990). Similar observations have been reported for mistletoe-infected Douglas-fir (Alexander and Hawksworth 1975), but there is little if any data available to quantify the relationship between Douglas-fir dwarf mistletoe infection levels and survival following prescribed burning.

Evaluation Questions

- ☒ Is there a difference in the rate of survival after underburning among uninfected and
  infected Douglas-fir trees?

- ☒ Does the severity of infection affect survival?

- ☒ Does the height above the ground of the lowest mistletoe broom affect survival?

- ☒ Does the fuel load immediately around infected trees affect survival?

Approach

After mechanical treatments are completed, establish permanent plots in Units 9 and B. Sample Douglas-fir trees in a variety of diameter classes and the following four infection levels:

-uninfected (DMR 0),
-lightly infected (DMR 1-2),
-moderately infected (DMR 3-4) and
-heavily infected (DMR 5-6).

Collect data on fuel load and height above the ground of the lowest mistletoe broom. Compare survival after burning among the infection levels.

Southwest Oregon Forest Insect and Disease Service Center will prepare a monitoring plan and install plots beginning in Fall 2001.

V. TREND MONITORING

Trend monitoring is designed to detect changes over time, and is useful for assessing how management activities occurring throughout the watershed are affecting (positively or adversely) landscape or watershed scale processes.

A. Water Quality and Hydrologic Function

Introduction

The Ashland Watershed is important to the City of Ashland as the primary source of its municipal water supply, and is an important source of cold water feeding downstream aquatic habitat. Therefore the maintenance of water quality and hydrologic function are important considerations in the management of the Watershed. Trend monitoring is useful for detecting changes in overall watershed conditions, which influence water quality and hydrologic function.

Evaluation Questions and Approach

The *Rogue River National Forest Ecosystem Monitoring Framework* (Forest Monitoring Framework) outlines Key Questions, Approach, and Methodology for monitoring water condition and stream morphology as indicators of the health of aquatic systems (physical and chemical) (USDA 1997). Conduct monitoring in the Ashland Watershed according to approach and methodology outlined in the Forest Monitoring Framework and the Water Quality Monitoring Handbook prepared in conjunction with the Forest Monitoring Framework.

Install three recording rain gauges within the Ashland Creek Watershed, one on the East Fork, one on the West Fork, and the third atop Hosler Dam. Re-install the East and West Fork Ashland Creek gauging stations

Data Analysis and Storage

Gauging stations and data storage would be maintained by USGS. Data previously collected is available real-time and located on the USGS Internet website: http://water.usgs.gov/usa/nwis/nwisman?site_no=14353000 (West Fork) http://water.usgs.gov/usa/nwis/nwisman?site_no=14353500 (East Fork).

B. Late-Successional Reserve Integrity

Introduction

The Mt. Ashland Late-Successional Reserve is part of a network of Late-Successional Reserves designated across the range of the northern spotted owl. The overall objective of the Late-Successional Reserve network is to maintain long-term connectivity of late-successional and old-growth forest ecosystems, which serve as habitat (including migratory and dispersal) for late-successional and old-growth forest related species. The overall goals and objectives identified in the Mt. Ashland Late-Successional Reserve Assessment is to develop and maintain a range of late-successional forest conditions based on local site capabilities and fire regime of southwest Oregon and northern California.

Forest conditions should include a diversity of habitat types including early successional, open canopy forest, hardwood forests, and non-forested areas to provide for a diversity of plant and animal species. The spatial distribution of late-successional and old-growth habitat would exist in a manner ensuring connectivity and late successional ecosystems across the Late-Successional Reserve. Landscapes are resilient to disturbances such as fire, insects, disease and are relatively resistant to large scale disturbances that could potentially impact connectivity within the Mt. Ashland LSR as well as connectivity to the Late-Successional Reserve Network.

Evaluation Questions and Approach

Landscape-scale monitoring of the watershed, or landscape level trends in proportion and distribution of successional stages will be evaluated using aerial photography and satellite imagery post project, and periodically over time; at 10-year intervals or following major disturbance events.

Annual Regional Aerial Detection Surveys will be used to monitor trends in insect and disease outbreaks over time.

Ecology plots monitored by the Area Ecology Program, provide an opportunity to measure the effects and trends over time, of management activities in the Watershed. Plots established and inventoried (1975-85) provide information on plant species composition, structure, and landscape pattern. To date, only a decade of time separation is established, which is not enough to provide trend data. More time series data is needed to determine change and evaluate the cause of change as it is detected.

C. Aquatic Habitat

Introduction

East and West Forks of Ashland Creek provide good examples of pristine salmonid habitat, protected as a Municipal Watershed (MA-22 – Restricted Watershed) for the City of Ashland, and managed as Late-Successional Reserve under the Northwest Forest Plan. The streams are important analog sites used to compare with stream channel conditions in other streams of similar geomorphology in the Siskiyou Mountains. The Riparian Reserves contain a high percentage of mature and late-successional conifer forest, providing an excellent long-term supply of large wood to the stream channels and numerous benefits to riparian-dependent species.

East and West Forks of Ashland Creek, and their tributaries, are steep and highly dissected drainages. The main channels of the two forks are predominantly "B1, B2" stream types (2-4% gradient) (Rosgen 1994) and valley types of colluvial and bedrock canyons with inclusions of alluviated canyons (Frissel 1986). This geomorphology results in numerous pocket pools created by boulder and bedrock substrate and occasional large wood material. These pocket pools provide excellent microhabitat for fish rearing. Fish surveys completed in East and West Forks of Ashland Creeks revealed a healthy population (each pool surveyed containing 1 to 2 adults with all age classes present) of cutthroat and rainbow trout exists within both forks (USDA 1990, 1998). Tributaries to the East and West Forks of Ashland Creek are primarily "A1" stream types (> 4% gradient) and valley types of colluvial and bedrock canyons. The combination of steep gradients and low stream flows in these tributaries do create habitat capable of supporting fish populations. Descriptions of the stream channel types and canyon types can be reviewed in the 1995 *Bear Watershed Analysis*.

A field review of stream conditions following the 1997 New Year's Day flood revealed that some large wood had been flushed through the stream. Nevertheless, the habitat appeared to be in good condition and comparable to pre-flood conditions. Excellent water temperatures contribute to optimal habitat conditions for fish. During the summer of 1994 (record drought), high stream temperatures were 64.4 degrees Fahrenheit in East Fork of Ashland Creek. Maximum seven-day average high stream temperature for 1993-1995 and 1997 (no data for 1996) were 60.8, 64.4, 52.3, and 60.2 degrees Fahrenheit, respectively.

The stream channels within the East and West Forks of Ashland Creek and their tributaries can accumulate high amounts of fines (fine sediment embedded in bottom of stream channel) due to unstable and highly erodible granitic terrain (see Geology and Soils). Following the 1997 New Year's Day Flood, some bank erosion was evident. Much of the sediment was flushed throughout the Ashland Watershed and deposited into Reeder Reservoir.

USFS and BLM contracted macroinvertebrate surveys during 1994-5 in West and East

Forks of Ashland Creek with Bob Wisseman, Aquatic Biology Associates, Inc. Wisseman stated, "The East and West Forks of Ashland Creek above the reservoir can serve as reference sites for the region, and more specifically for granitic watersheds in the area. These can also be classified as old-growth control sites, though there has been some logging/roading activity in the Watershed in the past." In his 1995 report, Wisseman describes high quality habitat conditions: "What this site, and a hand full of others in SW Oregon, demonstrates; is that a granitic watershed, where stream channels are naturally storing and transporting high amounts of coarse, granitic sand, can display and maintain very high biotic integrity".

Reeder Reservoir serves as a rearing area for large trout. These fish are unable to spawn or migrate up the East and West Forks of Ashland Creek due to small constructed sediment ponds at the mouth of each creek, which prevent fish passage. Fish within Reeder Reservoir are also prevented from migrating downstream due to the presence of Hosler Dam, except during past flushing of the reservoir. Unnamed tributaries, which flow into Reeder Reservoir, serve as spawning areas for fish that reside in the reservoir.

Upper Ashland Creek, from Hosler Dam to City of Ashland Water Treatment Plant, has poor habitat conditions due to dewatering of the stream for municipal water purposes. Few fish exist in this stream segment (USDA 2000). A segment of upper Ashland Creek from the City of Ashland Water Treatment Plant to Granite Street Reservoir, provides fair habitat for resident fish populations and contains the highest quality fish habitat within mainstem Ashland Creek. Stream and valley types are similar to East and West Forks of Ashland Creek ("B1, B2" stream type, colluvial/bedrock canyons). A road accessing the treatment plant is located adjacent to upper Ashland Creek and encroaches upon the stream channel and its floodplain. Road encroachment in most segments of the stream decreases sinuosity, which effects habitat diversity and quality, important for winter rearing. A moderate population (less adults than expected, age classes not well-represented) of rainbow and cutthroat trout were surveyed in this segment. Numerous pocket pools with a few high quality pools were present. The pools were created by the large boulders and bedrock substrate, large wood was lacking. Continual activities associated with road maintenance, will inhibit the function of this stream segment in the future.

The four unnamed tributaries in this segment of Ashland Creek have low or nonexistent stream flow, lack pool habitat, and are too steep to support fish populations. The tributaries are similar to tributaries of East and West Forks of Ashland Creek stream and valley types ("A1" stream type, colluvial/bedrock canyons). In addition, fish passage is blocked by impassable culverts located at road crossings (non-system road leading to City of Ashland Water Treatment Plant) of these tributaries (ODFW 1999).

Trend monitoring is designed to detect changes in aquatic habitat conditions and fish presence and absence over time, and can be used as one indicator of overall watershed condition.

Evaluation Questions and Approach

In addition to the water quality parameters described above, the aquatic and riparian parameters to be measured are listed below. These parameters are indicators, utilized for baseline data and reveal upward or downward trends in stream conditions and fish habitat.

The high priority monitoring parameters to be measured pre-, post-project, and every 5 to 10 years are:

- Pebble counts
- Macroinvertebrate assemblages and abundance (biological integrity)
- Fish habitat in the East and West Forks of Ashland Creek, and below Reeder Reservoir (including down woody material).
- Fish presence and absence by establishing two permanent sites on the East and West Fork of Ashland Creek.

Monitoring aquatic habitat and fish presence and absence has been ongoing in Ashland Creek Watershed, more intensively since the early 1990s.

Data Storage and Analysis

Data is stored in Geographical Information Systems (GIS), Region 6 Forest Service Stream Survey database (in process of converting to Oracle database), Excel spreadsheets, and hardcopy format (on file at the Ashland Ranger Station).

Analysis of individual data sets is conducted under contract or by Forest aquatic biologists as data is collected. Overall analysis and synthesis of data will occur periodically and likely in association with watershed analysis updates.

D. Avian Monitoring through Klamath Bird Observatory

We will use a Before and After Control and Impact (BACI) study design to monitoring the ecological effects of planned commercial thinning and fuel reduction activities. A minimum of 50 independent monitoring stations will be established in association with each treatment type and in untreated control sites. 1-2 years of pre-treatment baseline data will be collected (depending on project and timber sale timelines) and 3-5 years of post treatment effectiveness monitoring data. Standard bird and habitat survey techniques will be used to determine the ecological effects of treatments.

To contribute to KBO efforts to monitor long-term trends throughout the region it is recommended that intensive constant effort demographic monitoring mist netting station be established to provide landscape level trends in bird population size and annual productivity.

Please contact:

John Alexander, Executive Director
Klamath Bird Observatory
Email: jda@KlamathBird.org
Phone: (541) 201-0866

REFERENCES

Agee, James K. 1996. "The Influence of Forest Structure on Fire Behavior." *17th Forest Vegetation Management Conference*; 52-68 pp.

Alexander, Martin E. and F.G. Hawksworth. 1975. Wildland fires and dwarf mistletoes: A literature review of ecology and prescribed burning. USDA Forest Service, GTR-RM-14. 12 pp.

Badura, George and Philip Jahn. 1977. *Soil Resource Inventory for the Rogue River National Forest.* Medford, Oregon.

Brown, James K. 1974. *Handbook for Inventorying Downed Woody Material*. USDA Forest Service General Technical Report INT-16. Intermountain Forest and range Experiment Station. Ogden, Utah

Flanagan, P. 1996. "Survival of Fire-Injured Conifers. *Fire Management Notes,* 56:13-16 pp.

Frandsen, William and Kevin C. Ryan. 1986. Soil moisture reduces below ground heat flux and soil temperatures under a burning fuel pile**.** *Canadian Journal of Forest Research*. 16: 244-248 pp.

Frissel, Christopher A. 1986. *Classification of Stream Habitat and Watershed Systems in South Coastal Oregon and an Assessment of Land Use Impacts.* Oregon Department of Fish and Wildlife. Portland, Oregon.

Hall, Fredrick C. 1999. *Ground-Based Photographic Monitoring* DRAFT. Natural Resource Unit – Pacific Northwest Region. USDA Forest Service. Portland, Oregon

Hall, Fredrick C. 2000. *Photo Point Monitoring Handbook* DRAFT. Natural Resource Unit – Pacific Northwest Region. USDA Forest Service. Portland, Oregon

Harrington, Michael G. and F.G. Hawksworth. 1990. Interactions of fire and dwarf mistletoe on mortality of southwestern ponderosa pine. In: Krammes, J.S., Tech. coord. Effects of fire management of southwestern natural resources, Proceedings of a symposium. November 1517, 1988, Tucson, AZ. USDA Forest Service, GTR-RM-191: 2234-240.

Harrington, M.G., and S.S. Sackett. 1992. "Past and present fire influences on southwestern ponderosa pine old-growth". *Old-growth forests of Southwest and Rocky Mountain Region*. Workshop, Portal, AZ. pp. 44-50.

Hawksworth, Frank G. and D. Wiens. 1996. Dwarf mistletoes: Biology, pathology and systematics. USDA Forest Service, Agriculture Handbook #709. 410 pp.

Oregon Department of Fish and Wildlife. 1999. Aquatic survey data, on file at the Ashland Ranger District.

Rosgen, Dave. 1994. *Applied Fluvial Geomorphology*. Unpublished course manual. Wildland Hydrology Consultants. Pagosa Springs, Colorado.

Ryan, K.C. 1990. "Predicting Prescribed Fire Effects on Trees in the Interior West." M.E. Alexander, F.F. Bisgrove technical advisors The Art and Science of Fire Management. Proceedings of the First Interior West Fire Council Annual Meeting. Forestry Canada, Northern Forestry Centre. 148-162 pp.

Ryan, K.C. and W.H. Frandsen. 1991. "Basal Injury from Smoldering Fires in Mature Pinus Ponderosa." *International Journal of Wildland Fire*. 1: pp. 107-118.

Sandberg, David. 1980. *Duff Reduction by Prescribed Underburning in Douglas Fir*. PNW Research Paper MW-272. Portland, Oregon.

Swezy, D.M. and J.K. Agee. 1990. "Prescribed Fire Effects on Fine Root and Tree Mortality in Old-Growth Ponderosa Pine." *Canadian Journal of Forest Research.* 21: 626-634 pp.

Thomas, T.L. and J.K. Agee. 1986. "Prescribed Fire Effects on Mixed Forest Structure at Crater Lake, Oregon." *Canadian Journal of Forest Research.* 16: 1082-1087 pp.

USDA Forest Service. 1990. *Rogue River National Forest Land and Resource Management Plan*. Medford, Oregon.

USDA Forest Service. 1991. *Forest Service Manual 5140 – Prescribed Fire.* 12/16/91

USDA Forest Service and USDI Bureau of Land Management. 1994. *The Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl*. Portland, Oregon.

USDA Forest Service. 1995. *The Bear Watershed Analysis*. Ashland Ranger District. Ashland, Oregon.

USDA Forest Service. 1996. *The Mt. Ashland Late-Successional Reserve Assessment*. Ashland Ranger District. Ashland, Oregon.

USDA Forest Service. 1997. *Ecosystem Monitoring Framework.* Rogue River National Forest. Medford, Oregon.

USDA Forest Service. 1998. *Forest Service Manual. Title 2520 – Watershed Protection and Management.* R-6 Supplement No. 2500.98-1; August 24, 1998.

USDA Forest Service. 2000. Version 1.4.1. *Common Stand Exam Field Guide for Region 6.* Portland, Oregon. August 23.

USDA Forest service. 2001. *Final Environmental Impact Statement for the Ashland Watershed Protection Project*. Ashland Oregon.

USDA Forest service. 2001. *Record of Decision for the Ashland Watershed Protection Project*. Ashland Oregon.

USDA Forest Service. 1900 and 1998. Fish survey data, on file at the Ashland Ranger District.

USDA Forest Service. 2000. Aquatic survey data, on file at the Ashland Ranger District.

Wisseman, Bob. 1995. *Benthic Invertebrate Biomonitoring in the Rogue River National Forest, Oregon*. Prepared for USDA Forest Service, Ashland Ranger District. Aquatic Biology Associates, Inc. Corvallis, Oregon.

Appendix 8.7 Public Comments on AFRCA

From: "Dennis Odion" [redacted]
To: [redacted]
Date: 9/12/04 2:03:02 PM
Subject: Re: AFR 3rd alternative

from: Dennis Odion
re: proposed logging and other vegetation manipulations in the Ashland Watershed

Here are the comments I promised to send regarding the logging and other prescriptions proposed in Chapter 8 of the Ashland Community Wildfire Protection Plan . I have also attached my previous comments on behalf of the Native Plant Society opposing fuelbreak/fuel discontinuity approaches submitted to the Forest Service last April 30th. The letter asks the Forest Service to consider an alternative focusing on increased attention to the home ingnition zone and wildland urban interface (literal sense), so that wildfires could be better be accomodated.

I also have aalso provided a few specific comments attached to the CWPP AFRCA 9-9 document, which I have not had time to look at in detail.

Let me preface my comments here by saying that the plans that have been developed to improve preparedness within the community for inevitable large wildfire are outstanding features of the overall Wildfire Protection Plan. Preventing home loss in a wildfire event, and ensuring an uninterrupted water supply by planning for sedimentation impacts on Reeder Reservoir that will occur regardless of logging and vegetation manipulation are of utmost practical concern. Thus, my support an alternative that focusses available resources entirely on these concerns.

In addition, I am still unclear about whether there will be diameter limits in the City's proposal like there are in the Forest Service's proposal. The newspaper said the Plan opposed diameter limits because old trees may have small diameters. This is entirely irrelevant to the idea that large trees should be protected from logging by having diameter limits, and no other reasons explanations were put forth (economics are not cited or analyzed). Failure to protect large trees would lead to opposition from conservation interests. At the present time, approval of a large logging project without regulations on the size of trees that can be cut could, by precedent, threaten a large extent of the Sierra Nevada Mountains with such unregulated logging. The the framework developed through years of public-process that had been in place to protects these forests from such activities is currently being dismantled. Substantial efforts by natural resource conservation and ethics groups are being employed to prevent the dismantling of the Sierra Framework. I have cced a couple of folks involved in these efforts because of their interest in the Ashland HFRA project.

Comments

1. Opposite claims at the public meeting and in writings, Sugar pine is a fire sensitive species, at least in management burns (i.e safe season). It is comparable to white fir in terms of mortality (Stephens and Finney 2002). Language needs to be changed that discusses priorities for logging fire sensitive trees to prevent contradiction and confusion (i.e. fire sensitive species are targeted for cutting, but sugar pine is said to be a priority for not cutting).

2. Similarly, available science is not used in discussing past fire regime. The claim that the watershed used to burn "every 5-12 years" (made at the public hearing, little or no qualification elsewhere) is questionable, especially since Agee found no record of presuppression fire for a period of about 100 years at a location in the central/eastern Siskiyous, and Taylor and Skinner found that 75 years went by without fire along a ridge south of there. Moreover, these studies used an approach that is unsuited to addressing the question of maximum fire free periods in the landscape because areas less affected by surface fires are avoided. This is akin to sampling human height and avoiding tall people. The average height will be

too low to represent the whole population. Further, the fire free period prior to the first scar on the tree (the tree origin to first scar interval) is ignored, because it is indeterminable. This period is generally estimated to be substantially longer than scar to scar intervals. For these reasons, it is difficult to conclude what maximum fire free periods have been in recent centuries and whether we have "missed fire cycles." "Missed fire cycles" is also misleading because it generally refers to the interval between stand-replacing fire in a given location.

In order to better characterize the influence of fire in recent history, there is a need to look at the frequency of surface fire and the frequency of stand-replacing fire separately in a given area. Until we better understand what the frequency of both types of fire has been in throughout the Watershed, we cannot assess the extent to which there is a current shortage of area affected by each type compared to the recent past. In the absence of such information, a scientifically-based description of the degree to which fire effects have been excluded from the Watershed must assert clearly that data are lacking and that estimates of fire regimes in the recent past are based on uncalibrated estimates of surface fire frequency from surrounding areas.

The use of reference conditions from previous centuries, when the vegetation and fire regime were controlled by a different climate than exists now, needs to be justified as well. There is no explanation for the presumption that it is realistic to maintain Little Ice Age vegetation by the set of logging and vegetation manipulations proposed.

3. The best available science is also not used in describing the forests of the Watershed and what they may have looked like. The idea that they are supposed to be "open" forests is refuted by Waring's studies on the overstory leaf area. In the watershed and nearby areas, leaf area (it is a function of climate and water realations) greatly exceeds forests of the Rockies and Eastern US and other more or less closed forests (Waring 1969, etc). It is not clear what Leiberg meant by "open" (probably in comparison with the remarkably lush forests of the western Cascades), however, in the broader sense "open forest" "generally means wide spacing between tree crowns, such as the savanna like forests of the Southwest Desert Mountains, or the open forests of Serpentine lowlands of the Illinois River region. If all the trees that have established in the Ashland Watershed since WWII, when suppression became effective, were to be cut at low elevations, the forests would still not resemble "open" forests. The document is also missing a description of the natural vegetation of dry sites low elevations as chaparral (Detling 1961), and the implications of converting this natural vegetation to a man-made vegetation type.

4. Similarly, use available science to describe fuel dynamics for forests that are not open. Fuel build up concepts that come from formerly open ponderosa pine forests in arid regions of the West should not be presumed to apply without any empirical evidence that they do. Foliar fuels should also not be presumed to increase, as the leaf area in forests reaches a steady state early in succession (Grier and Running 1977). This is a fundamental ecophysiological property of forest vegetation which the plan contradicts (see attached comments). It is important to recognize that foliage reaches a steady state because foliar fuels drive crown fires, and this project is based on the premeise that the potential for crown fires has greatly increased. The amount of crown fire in all the contemporary wildfire acreage in the forest types in the Watershed is about 12 percent, which is similar to estimates of their presettlement fire severity proportions (Taylor and Skinner 1998). What is the empirical basis for presumptions that crown fire potential has greatly increased? There is talk about so called "ladder fuels." These are small shade tolerant trees which fire is said to spread upward through like the mythical rings of a ladder. However, no data are presented demonstrating the extent to which shaded trees possess sufficient foliage to spread fire (0.037 kg/cubic meter, Scott and Reinhardt 2001). Moreover, describing crown fire behavior as dependent upon fuel "ladders" is misleading. The forest canopy, like all potential fuel, will ignite only when vaporized. This requires preheating. Once the vaporized fuel is present it will ignite from a mere spark. The amount of heat impinging on the forest canopy determines this, which is a function of the total heat released in the understory and from adjacent tree canopies. Shade suppessed trees that are capable of burning may still not release enough heat to effect vaporization of the forest overstory. Crown fire in our region is a function of severe weather the vaporization is accomplished through the combined effects of high starting temperatures for fuel, little moisture to prevent their heating, advection of heat by wind and the bending of flames to direct heat from one tree crown to the other.

5. I mentioned at the meeting that the collateral damage from logging and the benefits from logging need to be weighed to produce a more scientific assessment of whether the logging is justified for the goals specified. Collateral damage to soils as a result of selective logging (thinning) is described in an attached legal declaration. This needs to be considered more thoroughly. An even bigger concern may be the unavoidable spread of exotic species (i.e. fuelbreaks have been shown to be exotic species "highways," see previous letter). In addition, research has shown that Phytophthoras, which cause sudden oak death and other forest diseases, are dispersed by human foot traffic. There are also studies that document how bull thistle, etc. invade pile-burned areas. Once again, there is a need to use existing science and to provide realistic expectations of collateral damage to ecosystems.

6. Similarly, existing science needs to be used to assess the benefits the City and Forest Service perceive from the proposed logging. Selective logging, unregulated by diameter limits, may open forests and increase fire severity by favoring the growth of pyrogenic shrubs (Show and Kotok 1924). Preventing this would be require expensive and destructive maintenance. The Plan does not describe how vegetation could be suppressed following logging treatments, nor the collateral damage of suppression activities. The Plan presumes that we can cut our way out of having fire prone vegetation in the Watershed. Even understory thinning is generally ineffective in influencing wildfire severity because fires that escape suppression are weather-driven and these are really the only fires that are relevant (see attached literature review on thinning effects on wildfires).

The percieved benefits of prescribed burning need to be assessed as well. Prescribed burning during safe conditions when plant moisture is high does not necessarily mimic wildfire, nor reduce fuel. It can create more fuel because plants are sensitive to heat at this time and are more easily killed (Swezy and Agee 1991, Odion and Davis 2000). Such burning was tried extensively in Siskiyou Co., the Klamath NF, etc. in the early 1900's and abandoned after it was found to cause forest attrition (see Show and Kotok (1924) manifesto on the history of "light burning" practices in Medit. climate regions), and descriptions by Aldo Leopold (1920). They explain how openings in Medit. climate forests (i.e. water availability and need are directly out of phase) caused by burning (as with logging) are accompanied by increased growth of shrubs, which have a self-reinforcing relationship with relatively severe fire.

The collateral damage of treatments is guaranteed. The probability that they could reduce stand-replacing fire, even if they were highly effective, is exceptionally low. The amount of free burning in the Watershed since fire suppression is low; it will take roughly 300 years for most of the Watershed to burn naturally at this rate. Moreover, there has only been talk of increasing the effectiveness of fire suppression, not allowing for more wildfire. Meanwhile, the amount of stand-replacing fire in all the contemporary wildfire acreage in the forest types in the Watershed is about 12 percent. The probability that a given stand will experience stand-replacing fire in a given year is therefore on the order of 300 * 0.12, or almost 1 in 3,000, which is likely much lower than in the past. Morever, as described above, the treatments proposed are not likely to decrease fire severity.

The treatments have also been said to be justified as beneficial restoration. A basic tenant of ecological restoration is that creation of form without function does not constitute ecological restoration (Kauffman 2004). Another basic tenant of ecological restoration is that eliminating the cause(s) of degradation is the first step in the restoration process. The causes of degradation in the Watershed are past logging and fire suppression. Therefore, ecological restoration in the Watershed can be achieved only when logging is eliminated and fire is allowed to occur with the relative severity and patterns that would occur under current climate (Kauffman 2004). As described in the previous paragraph, stand-replacement is likely lower than in the past due to lack of fire and because the amount of high severity fire that occurs in contemporary burns is modest. So, attempting to eliminate stand-replacement/stand-regenerating fire events is not really restoration. Ecological restoration would also specifically target the areas most clearly altered from past conditions (i.e. logged areas). But this principle of restoration is not being employed. The scale of prescribed burns is also far too small to accomplish fire restoration, and it cannot change significantly due to inveterate liability constraints. Small burns do not restore landscape structure (Baker 1994). Although they may be consistent with other goals, the fire containment and other suppression approaches sought for the Watershed are essentially the opposite of ecological restoration.

7. A pre-conceived strategy of using fuel discontinuities in remote areas to suppress fire may increase the risk to firefighters. This is particularly important to consider since the fuelbreaks/discontinuities proposed in the Plan are not designed based on safety considerations. Would there be liability concerns?

8. Finally, a response to the email about snags below. The idea that snags and wood need to be eliminated due to fire hazard is the basis for salvage logging projects such as the Biscuit. Snags and coarse wood do not contribute to flaming fire behavior. They burn by smoldering after the passage of the flame front, which is driven by the combustion of fine fuel, or foliage in the case of crown fire. The "hazard" that is associated with snags and large wood relates to the fact that the smoldering can be prolonged. When a fire is contained, the presence of still smoldering snags and large wood along the fire line can result in sparks crossing the fire containment line and causing a spot fire. The issue is that the presence of smoldering snags/wood along a containment line means "mop-up" time for suppression crews. Snags can also fall down in the midst of smoldering if they are rotten enough.. Otherwise, snags and coarse wood, especially large diameter, are desirable because of their importance to wildlife, fisheries, etc.

In conclusion, preparing the Community for the inevitable occurrence of a large wildfire, will make us better able to accommodate this natural process, which will benefit ecological goals. Approaches that aim to further suppress fire effects that have already been suppressed are at odds with restoration of these processes. Where these approaches involve logging and conversion of, natural vegetation, ecological impacts of these activities may be considerable. The forestry/silvicultural management approach outlined in Chap. 8 does not adequately take into account these impacts, nor does it use available science to support its many implicit presumptions. Therefore it is not adequate from a scientific perspective. The City should request the Forest Service to evaluate a science based alternative that does not promote fire suppression approaches as a means of dealing with the problem of lack of fire, or the goals of the City and the Forest Service should be changed to be consistent with the actions (i.e. eliminate natural fire effects).

That is "all" for now. Thanks for inviting me to comment and for your continued commitment to improving this project.

Dennis

****
Dennis C. Odion
Vegetation Ecologist
Institute for Computational Earth Systems Science
University of California, Santa Babara
website: http://www.icess.ucsb.edu/~denniso/
****

References Cited

Agee, J.K. 1991a. Fire history along an elevational gradient in the Siskiyou Mountains, Oregon. Northwest Science 65: 188-199.

Baker, W.L. 1994. Restoration of landscape structure altered by fire suppression. Conservation Biology 8(3): 763-769.

Detling, L.E. 1961. The chaparral formation of southwestern Oregon, with considerations of its post-glacial history. Ecology 42: 348-357.

Frost, E. J. and R. Sweeney. 2000. Fire regimes, fire history, and forest conditions in the

Klamath-Siskiyou region: an overview and synthesis of knowledge. Report prepared for World Wildlife Fund.

Grier, C.C. and S.W. Running. 1977. Leaf area of mature northwestern coniferous forests: relation to site water balance. Ecology 58: 893-899.

Kauffman, J. B. 2004. Death Rides the Forest: Perceptions of Fire, Land Use, and Ecological Restoration of Western Forests. Conservation Biology 18: 878-882.

Leopold, A. 1920. "Piute Forestry" vs. forest fire prevention. Southwestern Magazine 2:12-13.

Odion, D.C., and F.W. Davis. 2000. Fire, soil heating, and the formation of vegetation patterns in chaparral. Ecological Monographs 70: 149-169.

Scott, J. H. and Reinhardt, E.D. 2001. Assessing crown fire potential by linking models of surface and crown fire. U.S. Forest Service report.

Show, S. B., and E. I. Kotok. 1924. The role of fire in California pine forests. U.S. Department of Agriculture Bulletin 1294.

Stephens, S.L. and M.A. Finney. 2002. Prescribed fire mortality of Sierra Nevada mixed conifer tree

species: effects of crown damage and forest floor combustion. Forest Ecology and Management 162 (2002) 261-271

Stephenson, N. L. 1999. Reference conditions for giant Sequoia restoration, structure, process, and precision. Ecological Applications 9: 1250-1263.

Swezy, D. M. and J. K. Agee. 1991. Prescribed fire effects on fine root and tree mortality in old growth ponderosa pine. Canadian Journal of Forest Research 21: 626-634.

Waring, R. 1969. Forest plants of the eastern Siskiyous: Their environmental and vegetational distribution. Northwest Science 43: 1-17.

Westman, W. E. 2004. Measuring the inertia and resilience of ecosystems. Bioscience 28: 705-710.

Wills, R. D., and J. D. Stuart. 1994. Fire history and stand development of a Douglas-fir/hardwood forest in northern California. Northwest Science 68:205-212.

Eric Navickas
Comments regarding Ashland Forest Resiliency Community Alternative

In 1990 the Forest Service completed and released a decision for management in the Rogue River National Forest referred to as the Rogue River Forest Plan. The plan documented proposed timber yield from the McDonald Peak Roadless Area, the unroaded area at the top of the watershed. The alternative chosen stated that in the first decade the roadless area would yield 2.5 million board feet of timber and in subsequent decades 4 million board feet. (Exhibit A)

During the Clinton years the area remained unlogged due to decreased timber extraction from public lands. Under Clinton's Northwest Forest Plan of 1993 the area was defined as Late Successional Reserve (LSR) or areas set aside to protect Northwest Spotted Owl habitat. However, one of the loopholes of the Northwest Forest Plan was that it allowed logging into an LSR if it was done for Fuels Reduction.

In order to meet the timber yields proposed 14 years ago under the Rogue River Forest Plan, the Forest Service, under the Bush Administration, is exploiting this loophole to extract timber from areas that would otherwise be protected. The tactic is very effective as a means to meet industry demands for public timber due the general fear of fire among citizens and the general ignorance of the realities of what is actually being done on the ground.

The City came to this conclusion in the early eighties in a summary presentation to the EPA regarding management of the Ashland Creek Watershed when they stated, "The City of Ashland agrees with the need for a fire management program in the Ashland Watershed and is confident that a number of alternatives exist that are compatible with municipal watershed protection, however the Forest Service has appeared at times to justify a number of intensive activities within the Watershed in the name of fire management." The City continued by fully describing their position and stating that they would only support underburning. (Exhibit B) The 1979 statement from Al Alsing the former Director of Public Works is even clearer, he states, "1. The City's position is that logging should be eliminated from the watershed and the Forest Service has not agreed to this approach to managing the watershed. 2. The City does not agree with salvage and sanitation logging an the Forest service continues to discuss this as an alternative." (Exhibit C)

The issue again came to the forefront of controversy in the late nineties when the Forest Service proposed the Hazred Timber Sale. They were proposing to remove another three to five million board feet of timber in the name of fuels reduction. The issue was especially controversial because the Forest Service has just complete a massive sale in 1992 when they remove 8 million board feet for fuels reduction or about 2000 log trucks. The areas treated were generally high-graded for the best timber as it is difficult to find a stump less than three feet in diameter with many as large as six feet. The Hazred project, eventually renamed the Ashland Watershed Protection Project was heavily debated and eventually a decision was released that remove all commercial logging from the Ashland Creek Watershed and placed a strict 17" limit on logging proposed outside of the Ashland Creek drainage. The proposal, however, also included extensive noncommercial work in the watershed consisting of hand-pile and burn projects and the use of prescribed fire. The community and the City administration applauded the proposal. Keith Woodley was quoted in the Daily Tidings stating, "I support Linda's decision, it seems appropriate given the sentiments of the public and the input the Forest Service has received. I applaud their willingness to work with broad and sometimes divisive public sentiments."(Exhibit D)

What is most disturbing about this current proposal is the fact that the noncommercial work from the Ashland Watershed Protection Project has never been completed. According to Bob Shoemaker, the project manager, about 25-30% of that work has been completed but according to Linda Duffy about 50% of the project is complete. Regardless, the Forest Service has shown complete negligence with regard to really protecting homes and the watershed. This project should have been done this year and at best estimate half of it has been completed. The Forest Service has instead invested in expensive analysis to promote this current logging project and the Ski Ashland expansion.

The Forest Lands Commission team is now presenting an alternative to the Forest Service's proposal. The proposal presents goals of protecting Late Successional habitat much like the Forest Service however ultimately restricts nothing, they propose no diameter limit and imply that helicopter logging will take place into the roadless area. The document they have presented relies heavily on John Leiberg's 1900 analysis of the watershed and adjacent lands. I find this especially frustrating, as this document has always been used as an argument for the protection of the watershed from logging, as he states clearly, "But whether easy or difficult of access, it is obvious that maintenance of the Ashland Creek water volume is prohibitive to lumbering operations in the reserve."(Exhibit E) In 1910, when the City petitioned Congress to permanently protect the watershed they relied heavily on this document. Mr. Leiberg and Ashland's founding citizens would be rolling in their graves if they knew this was now being used as a tool to justify logging.

It is up to the Council to have clarity on this issue, to not get caught up in the fear tactics or the attempts to complicate the issue by using esoteric silvicultural analysis. The City has made clear statements in the past. Look back to Al Alsing's Statement, "The City's position is that logging should be eliminated from the watershed and the Forest Service has not agreed to this approach to managing the watershed." The City had seen the results of mismanagement of the watershed and the tendency to exploit fire management as a means to extract timber in the form of massive sediment loads to our reservoir. Is the Council willing to repeat history and allow this to take place again.

The most responsible choice for the Council would be to restrict logging and require only noncommercial fuels management. However, the Council must at least give some respect to history and place some firm restrictions on this project. We need at least a 17" diameter limit, a firm demand that no logging is allowed into the roadless area at the top of the watershed, a restriction on any further road building and a requirement that the noncommercial work proposed under the Ashland Watershed Protection Project is completed before any logging begins.

This is a moderate position that is clear and understandable. The Forest Lands team has offered enough complicated nonsense to confuse the most astute observer and yet said nothing. This is our municipal watershed we need clear restrictions.

ALTERNATIVE K
WAS CHOSEN

A

Table C-24
TIMBER OUTPUT (MMCF)

	A	B	E	G	K
Decade 1	0.47	1.68	0.00	0.00	0.47
Decade 2	1.12	2.61	0.00	0.00	0.73
Decade 3	1.12	2.61	0.00	0.00	0.73
Decade 4	1.12	2.61	0.00	0.00	0.73
Decade 5	1.12	2.61	0.00	0.00	0.73

Alternatives A, B, and K program harvest in all decades. In decade one, harvest level for alternatives A and K is 2.5 MMBF; Alternative B is 9 MMBF. Subsequent decade harvest levels are: Alternative A - 6 MMBF; Alternative B - 14 MMBF; and Alternative K - 4 MMBF. Alternatives E and G have no programmed harvest

Roads

Road construction parallels programmed timber harvest and is a reflection of developmental needs as roadless areas are entered by the various alternatives. Table C-25 shows the miles of road construction needed to accomplish management goals for the first two decades and also for the planning horizon.

Table C-25
ROAD CONSTRUCTION (MILES)

	A	B	E	G	K
Decades 1&2	5.5	13.0	0.0	0.0	5.5
All Decades	11.1	16.3	0.0	0.0	7.4

The first two decades of road construction is greatest in Alternative B because of timber volumes harvested. The miles of proposed road construction in all decades reflects the harvest volumes programmed for the planning horizon.

B

FIRE MANAGEMENT

The City of Ashland agrees with the need for a fire management program in the Ashland Watershed and is confident that a number of alternatives exist that are compatible with municipal watershed protection, however the Forest Service has appeared at times to be inclined to justify a number of intensive activities within the Watershed in the name of fire management. The basic fire management conclusions of the 1977 JMM study are summarized below:

1. The history of fires and fire management in the Rogue River N.F. indicates that the major problem fires were man-caused and that natural fires were generally suppressed in a short time.

2. There is a high potential for increased erosion due to an intense fire in the watershed. However, there is research information available that demonstrates that wildfire in unlogged watersheds can result in significantly less erosion and sediment movement than wildfire (whether man-caused or natural) in a logged watershed.

3. High levels of human activity such as that associated with logging or extensive over-night camping could be expected to increase the likelihood of a large man-caused fire.

4. Fire management involving intensive observation and quick response in suppressing all fires is the most appropriate program for the Ashland watershed.

5. Although the physical removal of fuel from the watershed would present certain benefits, the extensive logging activities required to do this effectively would present far more hazards and potential for loss than for benefit. Prescribed burning for fuel reduction may present opportunities if the air quality impacts are minimized.

ASHLAND WATERSHED MANAGEMENT PRIORITIES

It is the City of Ashland's position that the most important management objective for the Ashland Creek Watershed should be to maintain and protect the municipal water facilities and water quality currently depended upon by the City. Although the Forest Service has implied that this is the case, many of their actions and statements point in a different direction. For example, in discussing the Forest Service policy regarding water quality for municipal watersheds, the Forest Service stated (USFS, 1980 in a memorandum to the City of Ashland):

> "Basically, we have the responsibility for providing raw water that is capable of meeting standards in the Safe Drinking Water Act (PL 93-523) after treatment. The treatment of the water to

1. No grazing within the watershed.
2. No expansion of the Ashland ski area without a DEIS.
3. Recreation activities such as skiing, fishing, hunting and hiking would continue under present constraints with no ORV use or overnight camping.
4. Fire protection practices would continue.
5. Minimal road maintenance of certain roads.
6. Certain types of restoration for the road system.
7. Fuel break construction of selected breaks.

C

It is pointed out that these are somewhat minor concessions. On the other hand the areas of nonagreement, which are summarized as follows, represent the major factors contributing to the degradation of the Ashland watershed, the interference with the City of Ashland's water supply system and eventual impairment of downstream fisheries habitat, irrigation facilities and recreation potential.

1. The City's position is that logging should be eliminated from the watershed and the Forest Service "has not agreed to this approach to managing the watershed".
2. The City does not agree with salvage and sanitation logging and the Forest Service continues to discuss this as an alternative.
3. It is the City's position that no more roads should be built within the watershed and most of the current roads should be "put to bed" except for minimal custodial and fire protection uses. We feel that the available information and analyses support this position. The Forest Service states that "this option should be kept open".
4. The City has strongly recommended that the watershed be withdrawn from mineral entry in view of the enormous impact that even minimal exploration activities could have on our facilities and the downstream waters. The Forest Service acknowledges that little, if any, mineral potential exists in the watershed but states that "the Forest Service while recognizing that a withdrawal of Ashland watershed per se to preserve a watershed's water quality would have tremendous effects on the mining industry nationwide".
5. There is some disagreement between the Forest Service and the City concerning the type of fire management necessary for the watershed. We feel that our approach of minimizing human activities within the watershed and maximizing fire observation and quick control is not only the most logical but backed up by the history of fires within the Rogue River area.

In summary, it is the City of Ashland's opinion that we are presently operating on a program which represents the most cost effective and environmentally sound solution to the City's water supply problems and the problems with downstream fisheries, water quality, irrigation systems and recreation. We do not disagree with the contention that much needs to be done in the Bear Creek basin to restore and enhance the water resource values which have been lost. However, we feel that before a capital and energy intensive program is recommended, definite progress should be made

See Flip Side

VF - ASHLAND - WATERSHED

Ashland Daily Tidings

Serving Southern Oregon Since 1876 • Ashland, Oregon • May 31, 2001 • 50 Cents

Duffy forest plan saluted

By Vickie Aldous 5-31-01
Ashland Daily Tidings

Ashland District Ranger Linda Duffy's decision to begin removing flammable material from the Ashland Watershed while enacting a ban on the cutting of large trees balances community concerns with the need to reduce the wildfire risk, according to Ashland Fire & Rescue Chief Keith Woodley.

"I support Linda's decision," Woodley said. "It seems appropriate given the sentiments of the public and the input the Forest Service has received. I applaud their willingness to work with broad and sometimes divisive public sentiments."

In the decision released on Tuesday, Duffy imposed a 17-inch diameter or greater limit on cutting of trees in the interface area where Forest Service land approaches Ashland. Trees larger than that could be cut if they threaten worker safety.

Woodley

The decision also deferred any logging in the controversial Winburn Ridge parcel, home to many of the Watershed's largest trees.

In total, the plan calls for logging on 147 acres in the interface area, manually treating 1,129 acres, prescribed burning on 273 acres and follow-up maintenance underburning on 1,152 acres.

The plan is a departure from a 1999 proposal to log trees of unlimited diameter on 452 acres, manually treat 32 acres, manually treat or conduct prescribed burns on 87 acres and conduct prescribed burns on 778 acres.

Eggers

Woodley said the new plan represents a good start for reducing flammable vegetation in the Watershed, now choked with trees and brush after 90 years of fire suppression efforts, although the overall strategy may need to be adjusted if fire risk is not reduced enough.

"I want to take a second look at conditions after the treatment is administered. But anything is a benefit. Nothing has pretty much been done on many of the areas. This is going to substantially reduce the wildfire risk up front. If we need to change course, we can do that," he said.

Despite the tree diameter limit, Eric Navickas of Ashland Creek First! said he cannot support the plan because of the logging component. He said wildfire risk can be reduced adequately and erosion minimized by hand-cutting vegetation, piling the material and burning it along with prescribed burning over areas of land.

"I've always felt the project can be done without a timber sale," he said. "I'm prepared to ~~file an~~ appeal over that."

See WATERSHED, Page 2

D

E

Creek one-half mile east of the town of Ashland. In addition to supplying water to this town, it furnishes irrigation for a number of fruit ranches, supplies motive power to one sawmill and one electric-light plant located above the town, one gristmill, one woollen mill, and a 5-stamp quartz mill located in the city, besides water for a cyanide reduction plant. It serves also in part as the town sewer. All in all, the stream is very important to the town.

The reserve contains no proper agricultural lands; the summits of the low spurs in the eastern areas might possibly be utilized for orchard purposes if cleared. Most if not the entire area is gold bearing. Quartz ledges occur in many places on the slopes of Siskiyou Peak and placer deposits exist, in all probability, near the head of the creeks. No mining is carried on inside the reserve area. The summit and slopes of Siskiyou Peak and the high northern Mount Wagner spur are grassy in many places. Sheep range here, or did the year before last. True, most of their runs had been on the slopes shedding water into Applegate Creek and Klamath River, but some had left their marks on the Ashland side. If the purity and stability of the water volume in Ashland Creek is worthy of consideration, the prohibition of sheep grazing within the reserve area should be absolute. A band of sheep confined to such a limited tract as the grazing area in Ashland Reserve soon makes the ground reek with most pestiferous exhalations, which can not but find their way into the running water.

The forest consists of stands of alpine-hemlock, red-fir, and yellow-pine types. The alpine-hemlock type occurs on the summit of the peak, and is composed almost wholly of noble fir. The others have the ordinary composition of their respective types elsewhere.

Fires have marked most of the forest, but have not burned in the reserve within the last ten or twelve years to any great extent, except on the summit of the range, at the base of the peak, where the timber on 300 or 400 acres has been almost totally destroyed.

The mill timber in the reserve is of good quality, except in the eastern portion, where fires, years ago, badly seared the most of it. It is generally difficult of access for logging operations. But whether easy or difficult of access, it is obvious that the maintenance of the Ashland Creek water volume is prohibitive to lumbering operations in the reserve. ←

The areal and timber estimates are as follows:

Forested and other areas in Ashland Forest Reserve, Oregon.

	Acres.
Area forested	20,000
Area naturally nonforested	1,700
Area deforested by fires of modern date	300

Editors note: Dennis C. Odion forwarded the following comments to the Nancy Slocum, Staff Liaison with the Ashland Forest Lands Commission. They were originally sent to the Technical Committee during the course of composing Chapter 8 of the CWPP, but *may not contain every electronic e-mail. They are presented in reverse chronological order.*

9/24/04

All,

I think, as Dominick pointed out, science (the primary literature) can a trustworthy guide. It is certainly more authoratative than opinions representing various levels of understanding. More importantly, there is not a really a problem with ambiguity in key areas of combustion physics. As long as no economic/political goals have been identified, it is logical and ethical to use first principles as the basis for decisions.

Along with other studies, the Perry study mentioned by Dominck indicates that a diameter limit of about 7-8 inches is all that is needed to be as effective as possible in achieving the Forest Service's goal to reduce crown fire. For the record, it should be noted, especially following Joseph's comments, that faily intensive logging of large trees can also reduce crown fire (at least in the short-term, but it has the opposite long-term effect) because it can eliminate tree crowns which fire may burn through (i.e. no crown = no crown fire).

Perry et als. findings are entirely consistent with what has long been known in the science of forest combustion, as described best I think by Byram (1959). Van Wagner (1977), and numerous subsequent studies, like Perry's have corroborated how the forest fuel array may contribute to crown fire. The occurrence of crown fire in forests depends only on three factors related to fuel (it needs to be emphasized that weather is frequently much more important). The fuel factors are unambiguous. 1. The amount of combustible foliage (i.e. most evergreens) per unit volume in the overstory canopy (note: leaf area reaches a steady state early in succession) 2. The rate of heat given off by combustion of the underlying surface fuel, (vegetation, and 0-8" diam. biomass on the forest floor, the smaller the diam. the more important to comubustion) and 3. The hieght of the forest overstory above the burning surface fuels. Since trees bigger than about 7-8 inches in diameter do not influence these variables, removal of them has not been associated with decreasing fire severity. This is why the "ladder fuel" concept promoted by economic interests and the agencies is deceptive and not grounded in first principles. In fact, there is a mechanism for explaining observations that thinning commercial sized trees may increase fire severity. It can increase weather related factors (mid-flame windspeeds and surface fuel temperature).

Cutting and disposing of trees smaller than about 7-8 inches followed by indefinate maintenance is consistent with the science of reducing the potential for crown fire, although crown fire will still occur when weather dictates. Moreover, if slash is not eliminated, fire can be exacerbated. Large areas have burned in recent years in areas where thinning slash was not treated (e.g. ~6,000 acres at Rodeo-Chediski). There are contraints on treatments to eliminate slash. Therefore, if the cutting treatments outpace the maintenance treatments, fire severity can increase due to an increase in surface fuel.

Whether the understory manipulation/maintenance program is best for ecological goals depends on the collateral damage, including the further lowering and homogenization, or suppression, of natural fire effects. The studies that show reduced fire severity following treatment of surface fuels all involved intensive treatments, because that is what is required to significantly reduce and suppress surface fuels. Some combination of cutting, piling, burning, herbicides, etc. that can suppress the understory are required. A lot of the life in a forest lives in the understory. Much of this life may be poorly adapted to the manicuring of its habitat using these treatments. Meanwhile, exotic species may be facilitated by the soil disturbances and vectoring of propagules. These potential effects and the potential effectiveness of a understory manipulation/maintenance program on fire should be weighed.

Dennis

9/20/04
RE: activity fuels

With all the night and weekend time the tech. team has been putting in, I hate to even comment at this point, but I do have a serious concern, and it it should be easy to address.

The language regarding slash needs to be more specific to reduce the possibility of treatments increasing fire severity. There is a serious problem with failure to clean up activity fuels after thinning and logging projects, especially big projects on Forest Service lands. In the Rodeo-Chediski fire, 2/3rds of the area that had been thinned but not broadcast burned still had activity fuels (lopped and scattered), and these areas experienced greater burn severity than did untreated areas. Pile burning is expensive and difficult over large areas and it does not always eliminate slash. There is already excess slash left from past projects in the Watershed. Unless the language mandates that slash will be eliminated, based on other projects on FS lands, it cannot be assumed That it will be treated, or that if it is treated, there will not be a net increase in available fuel and potential fire severity.

In order to require effective slash clean up after logging or thinning projects, perhaps it should be made a requirement of timber sale and other contracts. Some mechanism to ensure funding is needed. In addition, an enforcement mechanism is needed, but that may be an impossible requirement.

I did not look at other parts of the document with an eye toward what it would specifically require vs. allow the FS or logging companies to do. I hope the language allowing for logging of big trees is not open to interpretation as suggested by some previous emails requesting clarifications.

Sent: Sunday, September 19, 2004 11:56 AM
Subject: Re: Table of treatment priorities and acres

> Tech Committee,
>> RE: Comments on Table
>
> 1. If the 7" diam. limit in the McDonald Roadless area is best for that area, why is it not best for the rest of the area? I do not want to sound like a broken record, but why are diameter limits not being proposed for the project as a whole? Why is an answer to this basic question so hard to get. I think this question needs to be honestly addressed because the studies that do support thinning are based on cutting and completely disposing of very small trees grown in the open sun. These trees have the bulk density of foliage that allows them to carry fire well. What is the science that shows that logging of shade suppressed trees with little bulk density is effective in reducing fire severity? The logging of larger trees can lead to a more combustible understory. That situation has already been created in the Watershed.
>
> 2. I think the table could be really valuable to the reader if it contained some more info. Along with the acreage and vegetation, a brief explanation of the proposed treatment for each priority would be useful toward understanding potential impacts. This explanation should contain
> 1. Expected basal area/acre to be harvested for trees by size class (0-7", 7-14", 14-21", 21+"), or similar size class break down.
2. Any regulations regarding harvesting in these size classes (i.e. maximum diameter or basal area/acre).
3. Slash treatments that would be needed to achieve goals.
4. Follow up maintenance that would be needed to achieve goals. Much of the info. would be the same for different cells, so text would not have to be repeated, the reader could be referred to the initial description.
>
> The first column could be dropped to help keep the size of the table down. It is not necessary to list "no treatment" areas in a table of treatment areas. How these no treatment areas contribute to the overall fuelbreak scheme could briefly be explained with text and a map, column 1 could be made into a separate table. However, some of the areas listed as in need of "no treatment" may be more combustible that areas identified for treatment. Previous burn areas (e.g. the one on the Lamb Mine Trail) have fuels that appear more suited to crown fire than many areas of the Watershed. Many of the areas that have experienced crown fire recently in our region had burned previously. For example, much of the area that experienced crown fire in the east Antelope fire (Grizzley Peak) had burned previously in the early 1990's. In fires like Biscuit and the 1987 fires, previous burn areas either exhibited the same fire severity as long-unburned areas, or they had greater fire severity. They did not have lower fire severity. Given what is known fire severity patterns in our region, what is the basis for including previous burn areas under "existing fire resilient [i.e. resistant] areas"? The previous fuel breaks are also areas where crown fire is likely wherever shrub vegetation has grown. Since burns and fuel breaks are priority 3 in column 2, it seems like they can be taken out of the "no treatment" areas.
>
> 3. Pine dominated areas, are not necessarily "Readily made fire resilient [i.e. resistant]." In the McNally fire and in the biscuit fire, pine stands burned with a greater proportion of crown fire than fir dominated forests.
>

> Because the canopies of pines can support crown fire under less severe weather than fir forests, they can better compete with species that are physiologically favored in our climate (Waring studies). A vegetation will typically favor the fire regime that maintains it, and the pines need fire created openings for stands to establish because they are light-demanding. Many pines are near the maximum age they can reach. If they die before a fire creates these openings and high light levels they require, there would be a shift to less combustible non-pine dominated vegetation. Reduced combustibility would further act as a stabilizing feedback for the less combustible vegetation.
>
> Reducing pine and other fire-dependent vegetation may be consistent with the Forest Service goal of reducing crown fire, but loss of this vegetation would reduce biodiversity. Thus, I hope this goal will be qualified, and the requirements for long-term maintenance of pines and other fire-dependent species analyzed.
>
> Dennis

Sent: Sunday, September 19, 2004 6:34 PM
Subject: Re: Table of treatment priorities and acres

> Thanks Darren,
>
> I am still concerned that this is a Forest Service project, and "compelling reasons" to remove large trees, or "relatively large cohort 2 trees may be killed for various reasons relative to cohort 1 stand density" may mean something different to them than what they mean to the Tech group,
> which is not clear.
>
> Also, a clarification on my part: I did not mean to imply low intensity fire does not burn through pine stands repeatedly during their lifespans, just that the significant regeneration of new individuals or cohorts to mature size is strongly facilitated by occaisional creation of overstory gaps or openings by fire. These are sites that select for regeneration of light-demanding species. With an intact overstory, shade tolerant species are favored. The importance of gaps and patchiness to pine regeneration is better explained in the attached pdf.
>
> I also strongly agree with Frank's comment that burn seasonality needs to addressed more at some point. There are a lot of wildlife issues with spring burning (nesting birds, herps
> immobile in the forest floor during spring, etc). There are also effects on vegetation as described in a previous email. -do
>

Sent: Thursday, September 16, 2004 6:40 AM
Subject: Re: fuel treatment effects at Biscuit

In the McNally fire (150,000 acres, mixed conifer, etc.) thinned areas had 100 percent high severity. The fire had 8 percent high severity as a whole. This illustrates how if weather is not accounted for, and there is not a proper experimental design, it is not possible to make conclusions about treatment effects (see 2003 lit review I sent for pseudoreplication issues with thinning studies). Cone fire is also a more arid eastside system compared to here (ie. there is the same problem of extrapolating from dry systems to more closed forests). Finally, what is the collateral damage that has been done at Black's Mountain? and how do we know that any kind of fire would be worse?

Sent: Wednesday, September 15, 2004 12:05 PM
Subject: Re: Draft fire use text - chapter 8

> Jay,
>
> Nice work! As is obvious from my earlier comments, I like the idea of using fire to solve the problem of lack of fire. In terms of your desire for more on seasonality, I am familiar with the
> literature. In the interest of time, I have attached a document describing concerns (Chaparral.doc, see end part), which you can borrow from if you like. It was done for an analysis of the management proposed for the CS National Monument that a few of us helped prepare for WWF. The concern is mainly for highly fire specialized plants (i.e. those whose reproduction requires fire). It seems like the goals are more consistent with suppressing these species.
>
> In terms of effects of out of season burning on potential fuels, as I mentioned before, foliage and fine roots (or any living tissue) are particularly sensitive to heat when moist and vice versa. This is reviewed in the Wright and Bailey and other textbooks. Of course, there is less heat in a typical out of season burn. In fact, one problem with out of season burns in my experience in N. Calif., is that there is almost no fire effect produced. Not enough to be considered a disturbance in many cases (i.e. Pickett and White definition).
>
> For what it is worth, at Whiskeytown, out of season burning lead to increased potential fuel, as measured by FMH plots (Brown's method, key word is "potential"). The fire ecologist at Whiskeytown, Jennifer_Gibson@nps.gov, can tell you more about that. Closer to home, it
> would be useful to look at burns (Squires, Timbered Rock, Quartz) in areas that were heavily managed for a long time, i.e. where there is most likely a record of out of season burning. These burns had more high severity fire in forests than typically occurs (i.e. compared to unmanaged forests), but this may have been due entirely to weather.
>
> If you open the other document attached and search on "heterogeneity" you will find some text discussing observed heterogeneity (or lack thereof) in prescribed burns, which may help in terms of your desire for more text on spatial patterns. These were not out of season burns if I recall correctly. The researcher I quote is now at PSW Redding. FYI, papers at the recent Ecological
> Society of America meeting proposed that managing specifically for heterogeneity may best where goals are ecological. Creation of some patches of high severity via manipulation of fuel prior to burning was even suggested to create patches for new cohorts of conifers that depend on them to regenerate.
>

> Dennis
>
> P.S. The Forest Service (Stanislaus) has recently proposed post-fire clear cutting projects in areas where they used prescribed natural fire. You may want to have a precautionary statement about prescribed burning not being used for the purposes of generating stands for post-fire logging (from an ecological standpoint, it is better to log the trees without first burning the area). In general, it would be good if the plan (like your text) avoids any references to stand-replacing fire or snag forests as undesirable, lacking in value, etc., as that strategy is behind some of the
> more destructive projects proposed for federal lands these days (i.e. Biscuit project).
>

Chapter 9 Community Outreach and Education

Although progress has been made in community wildfire education, judging the effectiveness of past and present outreach efforts is difficult. As previously mentioned, fire departments are an effective *partner* in home protection. They possess a great deal of information that homeowners can use to safeguard their homes. Cementing this mutual responsibility is critical in alleviating the false perception that local suppression efforts alone will save all lives and homes. Creating a community culture of homeowner education and individual homeowner preemptive action remains the ultimate goal for local outreach.

Past Outreach Efforts

Year	Outreach Activity
1976,1977,1992,1993	Door to door dissemination of information in WUI
1999	Public Meeting At SOU. Sponsored by Chamber of Commerce
2001	Public Forum
2003	Addition of WUI maps and text to city website
2003	Watershed Disturbance Ecology Symposium at SOU
2004	Wildfire Homeshow at Ashland Armory
Ongoing	Wildfire Safety message in utility billing

Ashland's WUI Demographic

The Ashland WUI community is difficult to target in a single educational effort. Independent homes (old and new) mixed with newer subdivisions create a potluck of attitudes, organization, incomes, and relationships. This is further complicated by absentee owners who maintain rental properties in the WUI.

All of these homes and properties in the interface are connected by complex landscape features and wildland fuels. This diversity of landscape as well as the variety of property ownership requires a multi-faceted approach to education and outreach.

Multi-faceted Approach

There is no "silver bullet" that will motivate everyone to become fire-safe. Past efforts have generated awareness among owner/residents but no single effort has been uniformly successful. Each outreach generates interest and action in a portion of the audience.

Within organized subdivisions there are opportunities to develop sustained programs with the help of the homeowners' associations. This has proven to be an important tool to leverage blocks of homeowners in a significant portion of the Ashland WUI.

What is the Goal?

There are two associated goals for outreach: 1) the message itself, and 2) effective delivery of the message.

Fire Safety Goals in the Ashland WUI

1. Ensure safety of citizens and firefighters
   A. Implement evacuation planning/signage
   B. Maintain safe evacuation routes
   C. Enforce regulations related to wildfire safety
   D. Maintain highly trained and well-equipped firefighters

2. Minimize ignitability of structures
   A. Advertise home inspection program (SB360 Assessor)
   B. Create and enforce firesafe landscaping ordinance

3. Decrease wildfire spread potential and severity across landscape
   A. Continue Fuels Reduction Grant Program
   B. Fund City position when grants aren't available
   C. Maintain Water Funds for City lands management

Outreach Principles

1. Diversify message delivery through multiple media outlets
2. Maintain efforts through established channels
3. Use opportunities wisely. Focus on home-site safety
4. Target organized homeowner's associations
5. Make message clear and easy to accomplish

Upcoming Opportunities

The City Wildfire Evacuation Plan will be ready for introduction to the public in the fall of 2004. Aided by a Jackson County Title III grant, an opportunity exists for significant outreach to interface residents. The Community Emergency Response Team (CERT) program operated by Ashland Fire and Rescue is a good source of volunteers. CERT volunteers are Ashland residents trained by AF&R staff to aid in emergencies. As residents of the WUI zone themselves, they are good resources and enjoy being active in their neighborhoods. With grant funds available there may also be an employee paid to canvass neighborhoods in the evenings and weekends.

The City of Ashland sponsors home tours for various reasons: resource conservation, gardens, solar energy, etc. The Tree Commission suggested developing an Ashland Wildfire Safety Tour. The tour would focus on positive examples of brush thinning, appropriate landscaping, and home maintenance. Often, people don't have a positive mental image of fire safety. The objective is to show how a firesafe home can be attractive and functional.

The Oregon Department of Forestry will be sending out letters to residents in the WUI regarding Senate Bill 360 (described in Chapter 5). Under this bill there is an opportunity for the local fire department to have a certified assessor to help local residents comply with the regulations. This would be an advantage in Ashland so that local issues can be addressed.

Ashland Fire and Rescue was awarded a Title III grant for watershed education in 2003-2004. Part of this grant will be used to create a wildfire ecology interpretive trail. The trail will begin on Ashland Loop Road along the Alice in Wonderland trail and connect to the BTI trail down to Glenview Drive and upper Lithia Park. The signs will be installed in the Fall of 2004.

Action Items:

1. Implement outreach for the evacuation plan. Utilize CERT volunteers or paid employee to distribute information.
2. Sponsor wildfire home safety tour in Spring of 2005. Contact residents whose homes provide good examples.
3. Provide a certified assessor from AF&R for compliance with Oregon Senate Bill 360.
4. Complete fire ecology interpretive trail. Advertise location to public.

Chapter 10 *Summary of Action Items: Where Do We Go Now?*

This list of Action Items summarizes actions recommended for continued fire preparedness. This will be useful to citizens, the Ashland Forest Lands Commission, City Staff, and City Council for tracking the utility of this plan.

Action Items and Plan:

- **Implement outreach for the evacuation plan.** Utilize CERT volunteers or paid employee to distribute information, including AM radio station. Responsible Party: Keith Woodley, Fire Chief. Expected Completion: Spring of 2005. Funding: Title III and City.

- **Sponsor wildfire home safety tour in spring of 2005**. Tour of homes with good defensible space, fire-resistant landscaping, and fire safe construction.
  Responsible Party: Chris Chambers, Forest Work Grant Coordinator. Expected Completion: Spring 2005 and yearly after that. Funding: Small amount may help to advertise.

- **Provide a certified Oregon Senate Bill 360 assessor** from Ashland Fire & Rescue. Responsible Party: City of Ashland/ODF. Expected Completion: Fall/Winter 2004 or when class at ODF is given for certification.
  Funding: Title III (already acquired) if Grant Coordinator position is utilized.

- **Complete fire ecology interpretive trail**. Finish and install signs along Alice in Wonderland/BTI trails. Advertise location to public. Responsible party: Forest Work Grant Coordinator, City contract forester. Expected Completion: Fall 2004. Funding: Title III Watershed Education funds (already acquired).

- **Develop and enforce firesafe landscaping ordinance** for new and existing structures. Responsible party: Ashland Fire and Rescue staff. Expected completion: Fall 2004. Funding: City funds.

- **Adopt International Fire Code (Oregon Fire Code)** in the fall/winter of 2004. Include local amendments to regulate flammable vegetation around homes. Responsible Party: Ashland Fire and Rescue. Expected completion: Fall or Winter of 2004-2005.

- **Evaluate water flow capabilities in WUI neighborhoods under simulated worst-case fire conditions.** Identify those with potential problems and suggest mitigation measures to Public Works and property owners. Expected Completion: Study could be done in 2005. Unknown timeline for mitigation (if any) Responsible Party: City Staff. Funding: City funds to study capabilities and identify problem areas. Explore funds for possible mitigation measures.

- **Identify electricity infrastructure at risk during wildfire**. Identify mitigation measures and present cost analysis to Council/residents. Responsible Party: Ashland Public Works Department. Expected completion: Analysis done by end of 2005. Unknown for any proposed mitigation. Funding: City budget for analysis. Mitigation funds dependent upon cost and scope.

- **Conduct wildfire evacuation drills in different neighborhoods each year.** Responsible Party: Ashland Fire and Rescue. Completion: Plans are in the works to test the evacuation plan in the Spring of 2005. Each area in the WUI could be evacuated over time during a drill. Funding: Title III for 2005, city funds or Title III in following years.

- **Maintain grant-funded thinning projects over time.** This includes control of invasive species (Scotch Broom) and native grass seeding**.** Implement cost-share Scotch broom pulling in key areas. Responsible Party: Forest Work Grant Coordinator. Completion Date: Ongoing. Funding: Title III for staff time, possible funding for work includes Title II, National Fire Plan, invasive species management funds (State).

- **Maintain Staff position to manage WUI fuels reduction, interface with federal agencies, and promote wildfire home safety.** Responsible party: City Council, City Administrator. Completion Date: When grants are unavailable for position funding. Funding: City budget, ongoing grants through Title III, National Fire Plan.

- **Maintain yearly map of strategic fire suppression opportunities.** Responsible Party: Forest Work Grant Coordinator. Completion: updated yearly. Funding: Title III for staff time.

- **Semi-yearly Monitoring of the CWPP.** Responsible Party: Ashland Forest Lands Commission. Review document and Action Plan twice a year to monitor progress and make recommendations.

- **Develop a post fire management plan.** Responsible Party:

Literature Citations

Agee, James K. *The Historical Role of Fire in Pacific Northwest Forests* in Walstadt et. al. *Natural and Prescribed Fire in Pacific Northwest Forests, 1990. pp 25-38.*

Agee, James K. *Fire Ecology of Pacific Northwest Forests.* Washington, D.C.: Island Press, 1993.

Cohen, Jack D. Reducing the Wildland Fire Threat to Homes: Where and How Much? USDA Forest Service Gen.Tech.Rep. PSW-GTR-173. 1999.

Cohen, J. D. 2000. *Preventing disaster: home ignitability in the Wildland-Urban Interface*. Journal of Forestry. **98** 15-21.

Parker, Donald R. *The Oakland-Berkeley Hills Fire: An Overview By Oakland Office of Fire Services.* 1992.

United States Department of Agriculture (USDA) Forest Service. *Upper Bear Analysis.* 2003.

United States Department of Agriculture Forest Service. *Ashland Forest Resiliency Scoping Letter*. File Code 1950-12620. February 27, 2004.

Glossary of Forestry Terms

Age class: A classification of trees of a certain range of ages.
Aspect: The direction in which any piece of land faces.
Basal area: The cross-sectional area of tree boles in a forested area as measured at the diameter at breast height (dbh).
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.
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.
Crown Class: A class of tree based on crown position relative to the crowns of adjacent trees.
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.
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.
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.
Crown fire: Fire that advances through the tops of trees.
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.
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.
Diameter at breast height (dbh): The diameter of a tree 4.5 feet above the ground on the uphill side of the tree.
Down, dead woody fuels: Dead twigs, branches, stems, and boles of trees and shrugs that have fallen and lie on or near the ground.

Eco-type: A more or less homogeneous natural community type which occupies specific niches in the landscape. More or less synonymous with "landscape unit," but landscape units often will sub-divide an eco-type (often based on steepness of slope).
Fire hazard: The kind, volume, condition, arrangement, and location of fuels and vegetation that creates an increased threat of ignition, rate of spread, and resistance to control of wildfire.
Fire regime: The characteristic frequency, extent, intensity and seasonality of fires within an ecosystem.
Fire risk: The chance of various ignition sources, either lightning or human-caused, causing a fire.
Fire season: The period of time, usually during the summer and fall, when there are drier conditions and higher temperatures, and restrictions and rules designed to minimize forest fire risks are put into effect.
Fire severity: Measures the effect of fire on an ecosystem, especially the effect on plants. Fires are commonly classed as low, medium, and high.
Fire weather conditions: The state of the atmosphere within 5 to 10 miles of the earth's surface indicated by measures of temperature, pressure, wind speed, wind direction, humidity, visibility, clouds, and precipitation. The potential for fire weather conditions to influence fire behavior is generally described in terms of low to extreme.
Forest Health: The ability of forest ecosystems to remain productive, resilient, and stable over time and to withstand the effects of periodic natural or human-caused stresses such as drought, insect attack, disease, climatic changes, fire, flood, resource management practices and resource demands.
Fuel continuity: A qualitative description of the distribution of fuel both horizontally and vertically. Continuous fuels readily support fire spread. The larger the fuel discontinuity, the greater the fire intensity required for fire spread.
Fuelbreak: A strip of land in which vegetation has been manipulated such that fires burning into one are more easily controlled.
Ladder fuels: Flammable vegetation that provides vertical continuity between the surface fuels and tree crowns.
Landscape unit: A defined area of land with relatively consistent topography and vegetation.
Log Decomposition Class - Any of five stages of deterioration of logs in the forest; stages range from essentially sound (class 1) to almost total decomposition (class 5).
Lop and scatter: A method of slash treatment in which slash is cut into smaller pieces and spread out to decrease fuel accumulations so that it lies closer to the ground to increase decomposition rate.
Mature Stand: Traditionally defined as a discrete stand of trees for which the annual net rate of growth has peaked. Stands are generally greater than 80-100 years old and less than 180-200 years old. Stand age, diameter of dominant trees, and stand structure at maturity vary by forest cover types and local site conditions. Mature stands generally contain trees with a smaller average diameter, less age class variation, and less structural complexity than old-growth stands of the same forest type.
Merchantable timber: Trees large enough to be sold to a mill.
Monitoring: the process of collecting information to evaluate if objectives and expected results of a management plan are being realized or if implementation is proceeding as planned.
Mycorrhizae association: Symbiosis between particular species of fungi and the roots of vascular plants.

Old-Growth Forest: A forest stand usually at least 180-220 years old and typically suggesting the following characteristics: moderate to high canopy closure; a multilayered, multispecies canopy dominated by large overstory trees; high incidence of large trees, some with broken tops and other indications of old and decaying wood (decadence); numerous large snags; and heavy accumulations of wood, including large logs on the ground.
Overstory: The uppermost canopy layer in a stand.
Plant association: A group of plant communities which share the same set of dominant species and usually grow in a specific range of habitat conditions. There can be significant variation between sites and there is a great deal of variation at different successional pathways, vegetation trends and management opportunities.
Plant community: An area of vegetation in which the same set of species is present in all layers (tree, shrub, herb/grass, moss, and lichen)
Plant series or PAG: a group of plant associations that share a common feature of favoring development of particular tree species that will become dominant over time if the forest matures without disturbance.
Prescribed underburning: involves the controlled application of fire to understory vegetation and downed woody material when fuel moisture, soil moisture, and weather and atmospheric conditions allow for the fire to be confined to a predetermined area and intensity to achieve the planned resource objectives. (USDA, 2001)
Relative Density Index: The ratio of the actual stand density to the maximum stand density attainable in a stand. Used as a way to measure quantitative differences between stand densities. Measured on a scale between 0 and 1.00.
Release: A term used to indicate the increased growth that occurs in a tree or stand of trees following stand density reduction.
Restoration Ecology: The study of theoretical principles and applications in population and community ecology aimed to restore and rehabilitate highly disturbed or degraded ecosystems to their more natural states.
Riparian area: A geographic area (150-300') influenced by an aquatic component and adjacent upland areas.
Silviculture: The art and science guiding the establishment, growth, composition, health and quality of vegetation in forests and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis.
Site productivity: The capacity of an area of land to produce carbon-based life forms.
Slash: Tree tops, branches, bark, and other typically non-merchantable debris left after forest management activities.
Snag - Any standing dead or partially-dead, tree at least sixteen inches in diameter at breast height (dbh) and at least sixteen feet tall.
Stand (Tree Stand) - An aggregation of trees occupying a specific area and sufficiently uniform in composition, age, arrangement, and condition so that it is distinguishable from the forest in adjoining areas.
Stand Density - An expression of the number and size of trees on a forest site. May be expressed in terms of numbers of trees per acre, basal area, stand density index, or relative density index.
Stand Density Index - A measure of stand density independent of site quality and age. From the stand density index, an approximate number of trees, of a chosen diameter, capable of being supported on an acre can be determined.
Stocking level: The number of trees in any given area expressed as trees/acre.

Succession: The process through which vegetation develops over time as one community of plants replaces another; often described in terms of stages.
Swamper burning: A method of burning in which slash is thrown onto a burning pile.
Thinning from below: The cutting of non-dominant trees in a stand, usually in order to give more site resources to the dominant trees or to reduce ladder fuels.
Tree vigor: A measure, either subjective or quantitative, of the relative health of an individual tree.
Understory: The vegetation layer between the canopy and the forest floor, including forbs, shrubs, smaller trees, and other low-lying vegetation.
Wildland/urban interface: A geographic area in which the urban and/or suburban setting is juxtaposed and transitionally grades into the wildland environment.

Acronym Glossary

AF&R	Ashland Fire and Rescue
AFR	Ashland Forest Resiliency [Project]
AFRCA	Ashland Forest Resiliency Community Alternative
AWPP	Ashland Watershed Protection Project
AWSA	Ashland Watershed Stewardship Alliance
BTI	Trail in Ashland Forestlands
CERT	Community Emergency Response Team
CWPP	Community Wildfire Protection Plan
dbh	Diameter at Breast Height
EIS	Environmental Impact Statement
FDN	Fuel Discontinuity Network
FFY	Federal Fiscal Year
GIS	Geographic Information System
HFRA	Healthy Forests Restoration Act [of 2003]
MOU	[1992] Memorandum of Understanding
ODF	Oregon Department of Forestry
SOU	Southern Oregon University
USDA	United States Department of Agriculture
USFS	United States Forest Service
WUI	Wildland-Urban Interface

Approved by the Ashland City Council on September 21, 2004.

Signatures

____
Keith E. Woodley, Fire Chief, Ashland Fire and Rescue

____
Jeff Schwanke, Oregon Department of Forestry

____
Alan DeBoer, Mayor, City of Ashland

In collaboration with:

Ashland Forest Lands Commission
- Frank Betlejewski
- Richard Brock
- JoAnne Eggers
- Stephen Jensen
- Anthony Kerwin
- Bill Robertson
- Diane White

City of Ashland Staff
- Chris Chambers, Forest Grant Work Coordinator
- Jamie Newton, GIS Analyst
- Rich Hall, GIS Analyst
- Keith Woodley, Fire Chief, Staff Liaison
- Nancy Slocum, Staff Liaison

Marty Main, Small Woodlands Services, Inc.
Cindy Deacon-Williams, Conservation Director, Headwaters
Joseph Vaile, Klamath-Siskiyou Wildlands Center
Darren Borgias, The Nature Conservancy
Evan Frost, Wildwood Consulting

John Ames, Ashland Community Emergency Response Team
George Badura, Soil Scientist
Howard Heiner
Jay Lininger