Ashland Watershed Stewardship Alliance

A Draft Comment and Proposal
for the Ashland Ranger District
and interested citizens

in response to the

Ashland Watershed Protection Project
Draft Environmental Impact Statement

November 19, 1999

Contents

Ashland Watershed Stewardship Alliance

This comment and proposal is a compilation of many peoples time and efforts. We have not dedicated page numbers throughout this document. Some sections have their own page numbering. This table of contents outlines the various sections of this work in the order in which they appear:

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Mission and Vision Statement

Ashland Watershed Stewardship Alliance

We, the undersigned members of the Ashland Watershed Stewardship Alliance, support the following vision and mission of our group.

Our Vision

We envision a sustainable Ashland Creek Watershed ecosystem that, through a new understanding of the interrelationships between the community and the land, will ensure quality of life for the watershed and for the present and future generations of its people.

Our Mission

The mission of the Ashland Watershed Stewardship Alliance is to build respectful, responsive, and learning relationships between people, government, commerce and the environment.

The Purpose of this Comment and Proposal

Ashland Watershed Stewardship Alliance

The Purpose of this comment and proposal is to:

a) detail the concerns which many of the citizens and organizations in Ashland have with the Ashland Watershed Protection Project Draft Environmental Impact Statement for the Ashland Ranger District, and recommendations that can help to guide future collaborative efforts between the Alliance and the US Forest Service, and to further develop the information necessary to guide future land management actions.

b) serve as a tool to inform the public about the options which exist to complete the project to all required specifications in a timely and cost effective manner while integrating ecological, social, cultural and educational values.

Some Forest Service staff may find parts of this comment and proposal to be overly simplified, or covering well known and basic forestry concepts. Our goal is to make very complex terminology and ideas as understandable as possible to the general public. We do not mean to assume that Forest Service staff are not aware of or understand these concepts and authorities, but merely hope to engage a wider segment of the community in public land management. For those of you who are well grounded in the world of federal forestry, we value your input and comments to this work. And for all readers of this document, please forward your thoughts, ideas and comments to:

The Ashland Watershed Stewardship Alliance
In care of: Ashland Ranger District
645 Washington Street
Ashland Oregon 97520

The richness and strength of land management lay in the diversity and depth of thought which goes into it. Thank you for your time and efforts into making this work stronger.

Our Proposal

Ashland Watershed Stewardship Alliance

We, involved citizens of the Ashland Watershed, look to deal constructively with conflict and promote a collaborative relationship between the Forest Service and the people of this community. As neighbors within this forest, we share a common interest to begin the work necessary to mitigate the risks of wild land fire within the watershed, restoring a forest ecosystem which will be resilient to periodic natural fire events. We seek to accomplish this goal while maintaining the ecological, social, aesthetic, spiritual, economic and educational qualities which the people of this region value in these forests.

We believe it is essential to protect and restore ecosystem health within the watershed's Late Successional Reserve (dedicated to the development of old growth characteristics). We believe it is possible to craft a fire mitigation alternative which meets the stated requirements of the agency and the city of Ashland while selecting and applying various treatments which maintain and enhance the ecological qualities the community values in this forest. One example of these values is manifested in our stated desire to maintain the high value over-story trees, rather than using them to generate funds to offset the cost of fuels management.

Working with the Ashland Ranger District we hope to develop alternatives which can cover these costs, while building a lasting and mutually beneficial relationship with the agency- one which utilizes local expertise, folds local values into the planning process, and builds a culture of long term stewardship between the citizens of this community and the land.

We request that the agency:

1. Review the following comment and find it credible, clear and based on a solid understanding of the ecological, legal, economic and social realities of wild land fuels management.

2. Allow for a 60 day comment period to this citizen comment, structured so that the Ashland Watershed Stewardship Alliance can implement outreach programs designed to solicit response from other interested parties, and to create opportunities to educate and involve the greater community.

3. We request that the Ashland Ranger District, following this comment period, to formally accept representatives of the Alliance as members of a committee which will devise an alternative which reflects the goals of the Forest Service, the City of Ashland and the values of the community at large in a timely and financially responsible manner.

Our Goals and Principles

Ashland Watershed Stewardship Alliance

The following AWSA goals and principles will help promote and maintain a healthy, fire resistant ecosystem that can provide a quality water supply and Late Successional Reserve for this and future generations.

Ecological Goals and Principles

1. To search conscientiously for methods to incorporate all values of ecosystem health (e.g. water quality, late-successional forest habitat, etc.) in the context of fire hazard reduction practices.

2. To maximize retention of those elements of the forest structure that existed prior to the significant alteration of fire disturbance regimes.

3. To maintain structures, features and processes critical to functioning late seral reserves such as large trees, snags, down logs, soil structure and organisms, etc.;

4. To initiate management activities that will over time return wildfire hazard and fuel levels to pre-settler levels and ultimately restore a disturbance regime that more closely emulates the historic range of variability;

5. To minimize the need for continued intervention in the landscape for fire hazard reduction to eventually allow natural fire cycles to occur under the concept of a "natural fire plan" for the entire watershed.

6. To focus fire hazard reduction activities primarily on reducing the fuels from the brush and smaller understory trees that have increased above natural densities due to fire suppression.

7. To acknowledge the complexity and uncertainty inherent in wildfire management.

8. To acknowledge that we do not completely know how to manage the interlocking ecological functions of a healthy watershed.

9. To recognize the need to integrate vertical and horizontal vegetation management strategies with an emphasis on area-wide fuels treatments.

10. To utilize all information to assist in decision-making from best available local, regional, and national scientific research, and experience.

11. To initiate the collection, development and maintenance of ecosystem information gathered by all participants of the project.

12. To give greater attention to site-specific detail and comprehensive monitoring which will be used in adaptive management (applying lessons learned from one phase of the project to later phases).

13. To accomplish different aspects of the project in a sequence that allows for non-controversial treatments to proceed as soon as possible, so that lessons can be learned and applied later.

14. To help coordinate project activities within the urban / watershed interface.

15. To expand our concern to also include the future management of the Ashland watershed as a whole, including places outside the current project area.

II. Social Goals And Principles

1. To foster a community that will maintain a dynamic balance between social, economic, cultural, spiritual, and ecological values for all elements of the ecosystem and society.

2. To develop and nurture the shared responsibility of the community for the stewardship of the Ashland watershed (including planning, funding, implementation and monitoring).

3. To comply fully with both the letter and spirit of all applicable laws, regulations, Forest Plans and Standards and Guidelines regarding environmental protection.

4. To seek no exceptions to existing environmental statutes.

5. To go beyond minimum legal compliance to achieve the optimum in

actions that are desirable for the watershed ecosystem and the community.

6. To establish a process encouraging participation by all interested parties in an open and transparent manner that leads to understanding and trust.

7. To continue to build an inclusive organization that avoids prejudgements and seeks creative solutions to conflicts.

8. To provide support and training for all volunteers.

9. To encourage the involvement of youth in all levels of the projects.

10. To use these projects as an opportunity to educate people of all ages and backgrounds (including ourselves).

III. Economic

1. To base the decisions for fire reduction work on sound ecological guidelines and not on the extraction of commercial material to meet Project funding needs.

2. To work with the US Forest Service in developing new funding structures for the fire hazard reduction project and if needed to secure additional funding sources for the work.

3. To achieve the desired fire reduction objectives and to meet desired ecological goals in the most financially efficient manner practicable.

4. To support the employment of a diverse work force of local people and businesses, paying good wage.

5. To investigate and develop long-term opportunities for the use of project by-products, such as saplings or shrub foliage, in the local manufacture of value-added products.

Technical Forestry Report

Ashland Watershed Stewardship Alliance

Executive Summary

This AWSA Technical Report was created in response to the DEIS developed by the USFS for the Ashland Watershed Protection Project. The AWSA agrees with the conclusion of the USFS that strategic vegetation management is needed to reduce the risk of high intensity, large scale wildfire in the Ashland Creek Watershed, but does not agree that the alternatives described in the DEIS appropriately address fire hazard reduction in the context of the critical issues of late successional forest habitat and water quality/soil stability. The Alliance believes that the approach described in this report more appropriately balances fire hazard risk reduction with other forest values (i.e., Late Successional Reserve, wildlife habitat, and slope stability/water quality values).

This report introduces a framework for phased, adaptive action grounded in the complexity of the watershed, and a landscape oriented approach to fire hazard reduction, including a strategy for reducing fire hazard on private lands adjacent to the National Forest. Examples of how the framework can be applied to specific sites are given. A range of critical issues (from wildlife habitat, to soils stability, to large tree removal) are discussed, and key issues identified. The Alliance looks beyond the Forest Service lands to develop partnerships that can address fire hazard issues on privately owned lands in the city interface zone, and creates opportunities for pro-active community involvement at all stages (planning, implementation, and monitoring) of land management.

The following are key Alliance recommendations that differ from alternatives described in the Ashland Watershed Protection Project Draft EIS, and, applied collectively, will lead to a different action alternative than those presented in the DEIS. The Alliance proposal:

- ♦ Recommends applying knowledge of plant associations and vegetation response dynamics of identified plant associations to design appropriate wildfire management treatments.
- ♦ Recommends a strategy of increased use of area-wide, yet site specific, vegetation treatments and less reliance on shaded fuelbreaks to reduce the probability of large scale, high intensity wildfire.
- ♦ Recommends "flank" treatments based on relative density index (rather than crown spacing) to maintain full site occupancy and thus limit understory ingrowth.
- ♦ Recommends combining manual pre-treatments with underburning to better conserve soil resources and vegetative cover on geologically unstable slopes.
- ♦ Recommends a gradational retention of snags from ridges to slopes to more fully incorporate wildlife habitat and late-successional values into fire hazard reduction work.
- ♦ Recommends the application of fire behavior (FARSITE) and vegetation dynamic (ORGANON) models to provide information to help develop site specific vegetation manipulation prescriptions.
- ♦ Provides a suite of recommendations that can enhance the incorporation of wildlife habitat values into fire hazard reduction work.
- ♦ Recommends, and provides guidance for, an active monitoring plan that will inform a phased implementation of project activities over time.

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SCOPE AND INTENT

(written by Jeff Fields)

The catalyst and point of departure for this report is the Draft EIS planning document created by the USFS for the proposed Ashland Watershed Protection Project. However, the information and ideas presented herein are not structured as a point by point response to the information and assertions of that document. Rather, this report is a discovery and development document that will hopefully be used to help guide future collaborative efforts between the Alliance and the USFS, and to further develop the information necessary to guide future land management actions.

The Alliance agrees with the conclusion of the USFS that **"to protect Ashland's Municipal Watershed and late-successional habitat, vegetation management treatments are needed in strategic areas within the Ashland Creek watershed and adjacent drainages to reduce fire hazard and potential for a large-scale, high severity (stand replacing) wildfire."**

However, the Alliance further concludes that the USFS's preferred alternative, as described in the DEIS, is **not** the most appropriate strategy for reducing the potential for this type of fire while also safeguarding water quality and managing for late-successional forest characteristics in the Ashland Creek watershed.

The Alliance believes that there are practical actions that can be taken that will minimize changes to late successional forest structures and protect the water quality of Ashland Creek while substantially reducing fire hazard through vegetation and surface fuels management on USFS-administered lands; actions that will ensure long-term monitoring (and thus beneficial adaptations in management strategies); actions that will engage adjacent private forest landowners in fire hazard reduction efforts; and actions that will return social and economic benefits to the community of Ashland.

Additionally, many of the significant issues identified by the USFS in its scoping for the Ashland Watershed Protection Project are addressed. These include:

1. Impacts to water quality and hydrologic function
2. Impacts to soils and site productivity
3. Impacts to late-successional habitat and late successional reserve function
4. Impacts associated with the effectiveness of fire hazard reduction prescriptions and,
5. Impacts associated with the economic feasibility of implementing fire hazard reduction

The following pages comprise the AWSA proposal for continuing the process of developing appropriate land management activities for the Ashland Creek Watershed.

INTRODUCTION

An Approach to Determining Watershed Health

(by R. Hart)

Forest health is a term that has been used for various purposes and programs over the years, yet it is seldom defined. For our purposes, a useful definition is presented by W. Kolb (*Journal* of *Forestry*, 1994) which specifically identifies the products, structures and resources needed to support healthy forests ecosystems in the sense of satisfying at least some of our community's and society's public land objectives. The Applegate Health Assessment Team used the method to determine their forest health parameters. Kolb considers a healthy forest to have the following four characteristics:

1) the physical environment, biotic resources and trophic networks to support a productive forest.

2) resistance to catastrophic change and the ability to recover on the landscape level.

3) a functional equilibrium between supply and demand of essential resources (water, nutrients, light, growing space) for major portions of the vegetation.

4) a diversity of seral stages and stand structures that provide habitat for any native species and all essential ecosystem processes.

How does the Ashland Creek Watershed's health measure up to these four characteristics?

1) The physical, biotic, and tropic networks are intact to support the forest ecosystem over most of the watershed. There are some exceptions: fragmentation caused by roads 2060000, 2060200, 2060270, 2060489, 2060500, and 2060550; highly eroded road cuts and steep raveling areas; and agraded stream reaches in both the East and West Forks of Ashland Cr.

2) Within the watershed a significant threat exists of catastrophic disturbance what would alter the structure and composition of the area. High level of fuels, increasing mortality from dwarf mistletoe, bark beetle, and stagnation. Stand density, due to fire exclusion, now exceeds the carrying capacity of many areas across the watershed.

3) Overstocked stands are stagnant or show low vigor. Nutrient cycling is low because of fire suppression and larger, older trees -- especially the Ponderosa pine -- are rapidly dying across the watershed. These factors indicate a major imbalance between demand and supply of water, nutrients and growing space for some important vegetative components.

4) Seral stages and stand structures are not balanced across the watershed. Fire suppression activities since 1910 have produced an abundance of mid-aged stands, true fir on Douglas-fir sites and Douglas-fir on Ponderosa pine sites. In most areas basal area and leaf area exceed the carrying capacity of the site.

Based on the four criteria the forests in the watershed are probably unhealthy, however more data is needed to more accurately assess the current situation. To maintain the health and integrity of the watershed two things are needed: protect and restore diverse species and habitats; and mimic, to the degree possible, natural processes and successional patterns at the scale of both stands and landscapes. A more ecologically based stewardship will focus on what it leaves behind rather than on what it takes. Old trees will be protected, diverse plant species well be promoted and habitat imbalances redressed by restoration work. By protecting species diversity it enables organisms to respond to changing climatic conditions, maintain soil fertility, cleanse water and provide varied habitat.

FUTURE STEWARDSHIP DIRECTION

A great deal of forest research has concentrated in managed forests, until recently little has examined how forest ecosystems recover from natural disturbance. One important aspect is the importance of biological "legacies" -- those things that are passed from old to new and provide continuity through time. A primary goal of the Tech Team is to identify and protect legacies, such as snags and logs and diverse plant species. Snags and logs are habitat for many animals, including birds and insects that contribute to a robust forest by consuming defoliators and bark beetles. Old, decayed logs are rich sources of carbon for microbes and invertebrates, and in addition are efficient water reservoirs, sites of nitrogen fixation, and particularly during the summer droughts may be centers of biological activity for organisms that cycle nutrients. There are many other examples.

Of importance to remember, is that of addressing the issue of catastrophic fire in the watershed. The challenge is to create and maintain a watershed landscape that buffers and absorbs disturbances, rather than magnify them. Designing a stewardship strategy that restores health and diversity requires long range planning, and protection of the processes that keep systems healthy. It is critically important that natural processes be evaluated at a landscape scale that is appropriate to its disturbance regime.

SHORT-TERM GOALS

(written by Marty Main)

Two primary goals have been identified regarding management of the Ashland Creek watershed: (1) to provide high quality drinking water for the City of Ashland, and (2) to maintain and/or provide, areas of late successional habitat. It has also been generally agreed that the greatest immediate threat preventing full realization of those objectives is the threat to the area of large scale, high intensity, stand replacement wildfire. Creating and encouraging a more fire resilient landscape through actions proposed by the Ashland Watershed Protection Project and analyzed herein by the Ashland Watershed Stewardship Alliance is critical to accomplishing both objectives.

Fire requires three elements in order to occur—oxygen, an ignition source, and fuels (vegetation—both green and dead). Once initiated, wildland fire behavior is controlled by three variables—weather, topography, and fuels/vegetation (Agee, 1993). Obviously, little can be done to change oxygen levels, weather, and topography, although knowledge of each is useful in wildfire management planning. Preventing ignition source (e.g., Smokey Bear) is important, but lightning, arson, accidents, and other causes will continue to initiate fire in wildland settings. Modification of fuels and vegetation to achieve specific objectives, a process that has been occurring since the beginning of human civilization, is the most important element to focus on in altering wildfire potential. For this reason, the AWSA Tech Team arrived at the following objective for the approximately 10% of the watershed identified by the USFS for the Ashland Watershed Protection Project:

> "To design and develop vegetational conditions that minimize the potential size, intensity, and/or duration of stand replacing wildfire while minimizing impacts to, or even promoting where possible, other resources and values."

Successful modification of vegetation and fuels to achieve wildfire management objectives depends on an understanding of vegetational dynamics over long time frames and large scales, in this case at least on a watershed scale frame of reference. A more landscape-level approach to wildfire management was not within the scope of this presentation, both given the time frames involved and the pre-designated units already designed into the Ashland Watershed Protection Project. However, there is likely much room for improvement in analysis of wildfire potentials and impacts under a range of conditions for the entire watershed, such as is occurring through landscape modeling in the Applegate Valley and elsewhere. Although we will discuss some landscape level generalizations later in this report, most of our input will focus on stand level analyses and descriptions as they affect wildfire management decision-making in the project area of the Ashland Watershed Protection Project.

General Framework

(written by Richard Brock)

The AWSA approach recognizes the wide diversity of forest stand structures and vegetation communities which exist in the project area. The proposal recommends utilizing information about stand structure types and plant community dynamics to design appropriate treatments which balance the needs for fire hazard reduction, maintenance of water quality and late successional forest features. Treatment units are grouped based on similar attributes and treatments are designed specifically for each type. Rather than attempting to impose a uniform treatment in all of the proposed flank areas as is seen in the Forest Service proposal, this approach would determine what is the best short term and long term strategy for each type and then implement that strategy for that particular type. The net result would be equivalent or higher levels of fire resistance within a framework that is responsive to ecosystem needs.

HISTORIC DISTURBANCE AND CURRENT CONDITIONS

(written by Marty Main)

Significant changes in disturbance patterns within the last 150 years have created vegetational conditions that are much different than occurred prior to European settling of southern Oregon. These changes in disturbance pattern include the initiation of larger scale, higher intensity wildfire as a disturbance mechanism in the period of 1850 to 1900 to achieve specific objectives (e.g., styles of harvesting lumber to build developing towns created much more fire-prone vegetational profiles; ranchers and livestock operators intentionally set fire to help achieve their objectives (pasture); miners intentionally set fire to remove vegetation to help achieve their objectives; etc.). Following the serious wildfire years of 1901 and 1910 in the Ashland Creek Watershed area, the era of fire suppression and exclusion, shifted disturbance patterns once again—in effect, removing the primary disturbance mechanism.

As a result of these changes in disturbance pattern, stand development dynamics have produced a much different set of vegetational conditions. Changes include the following:

(1) Increased stand densities and stocking levels;
(2) Increased fuel levels and subsequent potential for larger scale, higher intensity wildfire;
(3) Shifts in species composition;
(4) Change in stand structure;
(5) Increased likelihood of mortality from insects and disease; and
(6) Decrease in ecosystem diversity.

These changes have produced vegetational conditions that are well outside the historical range of variability. Further, in their current untreated condition, existing stand conditions both within the project area and throughout the Ashland Creek Watershed are far from optimal in promoting, or even maintaining, desired goals noted above. In fact, stand conditions are currently conducive to producing outcomes, such as major stand replacement wildfire, that are highly undesirable from almost all perspectives.

In stand management designed to produce desirable objectives, three important characteristics need to be inventoried, managed, and evaluated over time. These three— structure, density, and species composition—will be described in the following section.

ASHLAND CREEK WATERSHED STAND DYNAMICS

(written by Marty Main)

In forest and resource management, modification of vegetational conditions on a stand level can be designed to meet pre-stated objectives such as previously described. Given that vegetation in the project area is so heavily dominated by stands of mixed conifers and hardwoods, principles of forest stand dynamics will primarily be used to describe and guide proposed changes and manipulation of vegetation to achieve wildfire management objectives.

Oliver and Larson (1990) describe four general stages of stand development that occur following a stand replacing disturbance: stand initiation, stem exclusion, understory re-initiation, and old growth. After disturbance, the stand initiation stage occurs for several years while new plant species invade the site. As seedlings and saplings grow, the developing vegetation tends to make a transition to dense canopies of the stem exclusion stage where growing space becomes fully occupied, site resources fully utilized, and new individuals prevented from entering the site. The stem exclusion stage continues until the trees get larger and natural mortality occurs, providing openings in the main canopy. In this understory re-initiation stage, new species and individuals begin to grow in the understory. Eventually, these overstory trees die and the trees initiated during understory re-initiation emerge to develop into the dominant stand, subsequently creating the true old growth stand structures characterized by multiple-age classes, size classes, and multi-layered canopies.

This model provides a good conceptual framework with which to understand how stands develop over time. However, this march over time through the four stages of stand development is considerably modified by various natural disturbances (fire, wind, landslides, insects or disease, etc.) or planned disturbances (harvesting, pre-commercial thinning and/or release, prescribed fire, etc.) that can return developing stands, or portions of them, to earlier stages of development.

Using the principles of stand dynamics, less wildfire-prone stand conditions in both vertical and horizontal directions can be anticipated, following application of proposed management activities. It is believed that this process could facilitate a clearer delineation of benefits and drawbacks associated with wildfire management activities proposed, on a unit-by-unit basis, on the Ashland Watershed Protection Project. This kind of analysis could also provide a usable framework by which to assess possibilities of minimizing impacts upon, or perhaps even promoting, other resources and values.

VEGETATIONAL CHARACTERISTICS

(compiled by Marty Main with Tech Team input)

STAND STRUCTURE

The most important stand characteristic to manipulate over time to achieve wildfire management objectives is stand structure, which is defined as the physical and temporal distribution of vegetation (primarily trees) in a stand. Understanding changes in stand structure with time, including stand behavior during and after disturbances, is essential for portraying the outcomes, both beneficial and otherwise, of stand management. For example, each stage of stand development previously described contains specific and recognizable structural characteristics. Associated with these developmental structural changes in the potential to achieve stated objectives or values, such as wildfire management objectives, wildlife habitat, insect and disease relations, species compositions, values associated with late seral reserves, and numerous others.

Three critical vertical components of stand structure that influence wildfire behavior have been identified:

(1) types, amounts, and arrangements of surface fuels;
(2) type, amounts, and arrangements of crown fuels; and

(3) the distance between the two, a distance that is significantly reduced by the presence of developing understory vegetation, better known as ladder fuels.

Wildfire management benefits can be obtained by reducing the amounts and/or arrangement of each of these vertical components of stand structure. However, it is important to note that reduction in surface fuels and increases in crown base heights are prioritized over decreases in crown closure in most stand-level wildfire management strategies (Agee et al., 1998).

Changes in stand structure on a horizontal basis can also produce wildfire management benefits. Fuelbreaks and shaded fuelbreaks are attempts to create horizontal discontinuities in vegetation and fuels. The effectiveness of fuelbreaks depends on a number of factors, including varying objectives; differences in prescription (width, fuel retained, level of maintenance); adjacent fuel conditions; the type of wildfire approaching the fuelbreak; the amount of technology and workforce directed at the fire; and others (Agee et al., 1998). The real question is not if fuelbreaks work, but when, where, under what conditions, and tradeoffs associated with values or resources lost or minimized by their installation.

In natural stand development, frequent, low to moderate intensity disturbance such as pre-settler fire in the Ashland Creek Watershed creates constantly changing patterns of gaps or patches of reduced vegetation or fuels (i.e., fuelbreaks). This pattern, called gap dynamics, creates a variable mosaic of fuels that can discourage development of stand replacement wildfire.

EXAMPLES OF CURRENT CONDITION

Within the project area, a complex set of stand structures currently exist. Some existing stand structures are relatively simple, such as in Unit 8 where an even-aged stand of relatively uniformly stocked Douglas-fir up to 14 inches DBH was initiated after an intense wildfire in 1901, undoubtedly the outgrowth of settlement-related activities of the last half of the 19th century that created a much more fire-prone environment.

Other stands within the project area, however, have characteristics indicative of several stages of development. On westerly aspects on the west side of Winburn Ridge, an aggregated old growth (300 years ±) ponderosa pine overstory developed in the pre-settler era under a regime of frequent, low to moderate intensity disturbance. This more open stand structural condition with numerous gaps in the fuel profile, was resistant to stand replacement wildfire. However, this aggregated old growth stand structure currently overtops a dense coniferous understory in the stem exclusion stage of stand development that was initiated after the beginning of fire suppression and exclusion, when disturbance patterns were shifted towards more infrequent, but ultimately higher intensities.

Elsewhere in the project area, stand structures were even more variable, confounded by more recent disturbance events such as tractor logging (in the early 1960's in Unit 39) and helicopter logging in the early 1990's throughout portions of the project area. These new planned disturbance events produce an even more complex stand structure, incorporating inherent variability with numerous small patches of different structures and stages of stand development, each with different developmental trends.

Although this diversity can make unit delineation a difficult and complicated undertaking, each type of stand structure in the project area can be characterized for its potential to initiate and/or sustain a rapidly expanding crown fire. Recent developments in assessment of types of stand structures that minimize the initiation and/or spread of wildfire indicate that there are both vertical and horizontal components to this analysis (Agee, 1996).

This diverse set of stand structures within the project area makes prescription development to achieve wildfire management benefits difficult. Nonetheless, in order to ultimately be effective, existing and future stand conditions must be effectively described in order to assess the effectiveness of proposed treatments. To facilitate this process, stand structure can be most easily described 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. For ease of discussion, they are generally classified as follows:

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

a. Generally 25 to 50+ inches DBH, 150 to 300+ years
b. Tend to be spatially dispersed, occurring singly or more commonly in small aggregations, thereby creating a more clumpy horizontal stand structure.
c. Were generally initiated in the pre-settlement era when disturbance patterns were of a more frequent, low intensity type, creating a greater diversity of age classes.
d. More common in topographical areas less prone to moderate intensity fire in the pre-settlement era or high intensity fire in the post-settlement era—gentler ridgeline locations, southerly and westerly aspects.
e. Ponderosa pine and Douglas-fir most common species.

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

a. Generally 10 to 25 inches DBH, 80 to 140 years.
b. Tend to be more spatially and structurally uniform typical of more even-aged stand structures.
c. Typically initiated following more high-intensity disturbance, such as the 1901 or 1910 wildfire events.
d. Often currently at excessive stand densities more typical of the stem exclusion stage of stand development, and rapidly declining in growth and vigor.
e. Douglas-fir most common species.

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

a. Generally 1 to 10 inches DBH, 10 to 50 years old.
b. Typical of the stand initiation or understory re-initiation stage of stand development.

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

d. Most noticeable in stands with recent disturbance history (e.g., initiation after tractor logging in Unit 39, helicopter logging throughout project area); elsewhere it occurs sparingly or in small openings that can create a complex stand structure.

e. White fir and/or Douglas-fir most common species in naturally regenerated stands.

For example, even-aged and relatively uniform stand structures dominated by cohort #2, such as found in Units 4 and 8 in the project area, exhibit several favorable stand structural values from a wildfire perspective. Surface fuels are generally light. Excessive competition throughout stand development has encouraged rapid early height growth, elevated crowns of minimal size, loss of lower limbs due to long duration of closed canopies, and subsequent minimal development of ladder fuels—in essence, creating favorable distances between surface and crown fuels (i.e., high crown base heights). These are favorable vertical stand structural components from a wildfire management perspective.

However, the lack of existing gaps in this relatively continuous vegetative cover provides little change in stand structure horizontally. Further, very dense canopies on a stand level represent a continuous, though elevated, horizontal fuel profile that is a strong negative in a wildfire event, encouraging the likelihood of sustained crown fire, with subsequent dramatic increases in wildfire intensity, rate of spread, impacts on resource values, and difficulties in wildfire suppression. Fortunately, most stands of this nature in the project area have high crown base heights, which much reduces the likelihood of crown fire initiation and spread.

On the west side of Winburn Ridge (Units 34, L, M), however, stand structures are more complex. The existing old growth overstory stand structure, created by pre-1850 disturbance patterns, is aggregated with pockets or clumps of mature ponderosa pine and less commonly Douglas-fir interspersed among numerous gaps (i.e., discontinuities of vegetation/fuel in the horizontal direction). This more aggregated pattern in stands with a history of frequent fire has been for ponderosa pine types elsewhere (Cooper, 1960, 1961; Agee, 1993). Unfortunately, changes in disturbance pattern since 1900 have encouraged development of a relatively uniform, dense stand of understory white fir and Douglas-fir primarily in the stem exclusion stage of stand development. This vegetational profile not only reduced or eliminated horizontal gaps in fuels, but also eliminated vertical gaps in fuel distribution, as ladder fuels present a relatively uniform fuel profile from ground to crown.

Recent management history within the project area has even further complicated stand structure. In Unit 39, tractor logging and partial cutting in the early 1960's removed portions of the pre-existing stand in a pattern that is hard to identify at this time. Clumps or individuals of the original old growth overstory are scattered among dense patches of cohort #2 and/or cohort #3 Douglas-fir and/or white fir. Various combinations and overlap between structural classes are evident. However, after almost 40 years since disturbance (i.e., logging), evidence of gaps is rapidly disappearing, being replaced by a more continuous fuel profile. Any wildfire management benefits associated with creation of horizontal discontinuities of fuel have effectively disappeared.

In Units 16-20, helicopter logging of small patches of timber created a structural landscape of yet even greater diversity. These small patches typically range from one-tenth to perhaps one acre or more in size. Early successional vegetation is rapidly returning to these patches. Many of the patches are too small to represent significant horizontal discontinuities in fuels, while continuing to compromise vertical discontinuity as ladder fuels develop.

STAND STRUCTURE STRATEGIES AND EXAMPLE UNITS

DISCUSSION OF SHADED FUELBREAKS

The most favorable stand structures from a wildfire management perspective are those that create the greatest amount of acceptable fuel discontinuity in vertical and/or horizontal directions. Shaded fuelbreaks, the primary wildfire management strategy implemented on U.S. Forest Service lands to date in the Ashland Creek Watershed, are areas where vegetation and fuels are significantly modified in both vertical and horizontal directions. As a result, shaded fuelbreaks have historically provided opportunities where suppression efforts can be concentrated during a wildfire event to encourage a transition from an unmanageable and highly destructive crown fire to a more manageable surface fire. Surface and ladder fuels are significantly reduced so that firefighting personnel can be safely deployed and utilize the areas for fireline construction and backfiring operations.

In the past, budget realities alone have prevented a more expansive wildfire management program. Given these constraints, concentrating efforts on implementation of shaded fuelbreaks to date has definitely increased the level of protection of the multiple resource values, including water quality and late seral reserve values, from destruction from catastrophic stand replacement wildfire in the Ashland Creek Watershed. The pioneers in the Ashland Ranger District of the U.S. Forest Service deserve credit for their efforts in reducing risk of damage to the many priceless resources of the Ashland Creek Watershed.

In extreme wildfire behavior throughout the West, however, the narrow shaded fuelbreaks have not always been effective at stopping advancing wildfires (Van Wagtendonk, 1996; Weatherspoon and Skinner, 1996). Many wildfires are of an intensity and magnitude that they can easily spot over the relatively narrow shaded fuelbreaks. To maintain minimum effectiveness, existing shaded fuelbreaks rely on external inputs, such as aerial retardant and work crews, to check the advancing fire. With decreasing budgets and air tanker availability, the potential usefulness of shaded fuelbreaks will also decrease in the future. Too, decreasing budgets also reduce the likelihood that shaded fuelbreaks will be adequately maintained in a timely fashion, particularly important given that developing early seral vegetation will over time make shaded fuelbreaks even more wildfire prone.

In response to these realities, thinning, partial cutting, and other area-wide treatment of vegetation and fuels is increasingly being accepted and used to further reduce the risk of damage or destruction to important forestland values (Weatherspoon and Skinner, 1996; Graham, et al., 1999). In these fuel treatment zones, stand density and fuel reduction activities are conducted on larger areas up to one-quarter mile wide or more. Stand density reductions do not have to be as dramatic as within shaded fuelbreaks, and a greater range of stand densities can be retained, often allowing for potential accomplishment of other objectives. Rather than relying on external inputs such as aerial retardant and personnel deployment to maximize suppression benefits within a narrow strip, these larger defensible fuel profile zones (DFPZ's) are designed to produce vegetation and stand structural values that can, as much as possible, offer wildfire management benefits without external inputs during wildfire events.

Within the project area, it is suspected that a one-quarter mile area-wide treatment of fuels may be as effective at providing control of advancing wildfire as a 400-foot-wide shaded fuelbreak in some locations. This needs to be looked at carefully as an alternative to the more typical shaded fuelbreak standards that have been used to date.

Similarly, proposals in the Ashland Watershed Protection Project suggest implementation of flank treatments as an attempt to increase the width of the fuel reduction zone. However, it appears that flank treatments are still being designed to significantly reduce stand densities so that aerial retardant could reach the ground. Concerns to address when adopting this strategy include:

(1) Some dense, even-aged stands in flank positions may not lend themselves to rapid and extensive reduction in stand density, particularly if vigor is poor, height/ diameter ratios are high, crown ratios low, and the stands subsequently susceptible to shock, tipping over, blowdown, etc.

(2) Opportunities for slope failure are aggravated at greater stand density reductions, particularly on the steeper slopes associated with flank positions. This concern is not as critical on the gentler ridgeline slopes typically associated with shaded fuelbreaks.

(3) Flank position, particularly those on more northerly aspects, are generally in more productive topographical locations than ridgelines and significant stand density reductions in that portion of the landscape, particularly if cut to the same standards as for shaded fuelbreaks, could potentially move them well outside the historical range of variability.

(4) Designing stand management strategies in flank positions that continues to rely on external inputs will remain dependent on adequate funding to insure aerial tanker availability. Too, reduced level of personnel will be even less likely to be deployed in more unsafe, steeper flank positions during wildfire events.

(5) Greater in-growth of ladder fuels and other early seral vegetation will remain a maintenance cost, with a significant reduction in fuel zone effectiveness if budget insufficiencies occur.

As an alternative, substituting (where possible) area-wide treatment of fuels and associated higher potential stand densities may be able to provide similar structural wildfire management benefits while maintaining or encouraging other important values. Appropriate levels of stand density reduction can be determined by such indices as relative density or stand density index (see section on Stand Density) that reduce crown bulk density while simultaneously maintaining full site occupancy and a subsequent reduction in future development of understory ladder fuels.

Identifying appropriate stand structures to strive for in area-wide fuel treatment strategies depends on very careful, site-by-site analysis including inventory of existing stand structures, as well as an understanding of stand trajectories and development after disturbance (i.e., management). Principles of stand dynamics, integrated into a framework created by the use of plant associations, can help describe these desirable structural changes.

Examples of favorable stand structures from a wildfire management perspective include:

(1) Stands dominated by cohort #1 and/or #2 at densities indicative of full site occupancy that allows for only limited vertical development of understory ladder fuels. These stand structures are most likely to be found and/or implemented on more productive northerly aspects. A good example of these types of stands occurs in Units 4 and 8, as well as in portions of Units 16-20 and in pockets of Units 34, 38, and 39.

(2) Stands dominated by aggregations of cohort #1 with limited development of vegetational profiles horizontally within the gaps between aggregations. These structural conditions were most likely to be found historically and could be reconstructed by proactive management on the west side of Winburn Ridge, and perhaps on southerly/westerly aspects elsewhere in the project area.

It is important to note that implementation of management strategies designed to create the above-described stand structures would likely move these stands closer to the suspected historical range of variability.

On the contrary, undesirable stand structures from a wildfire management perspective are common currently within the project area. Examples include:

(1) Stands of mixed cohorts 1, 2 and 3 that provide a relatively uniform vertical vegetational profile. Examples of this type occur in various portions of units in the Winburn Ridge area.

(2) Stands similar to those in #1, but without scattered individuals or aggregations of cohort #1. Units BB, C, and 10 are examples of these types of stands where relatively uniform fuel profiles in both horizontal and vertical directions occur.

(3) Plantations, either natural or planted dominated by a dense cohort #3 that produces uniform stand structures and fuel continuities in both horizontal and vertical directions.

STAND DENSITY

Although stand structure is generally regarded as the most important of the stand features to alter to achieve wildfire management objectives, stand density is of particular importance in many areas (especially in most of the Ashland Creek Watershed) because extremely high stand densities are well outside the historical range of variability. Numerous negative outcomes, given our predesignated objectives, can result. Most importantly, excessive stand densities have been clearly shown to result in significant decline in individual tree and stand vigor, a critical forest health concern. Insect-related mortality, including mortality of large, mature conifers, is consistently an eventual result if some other form of disturbance (i.e., fire, thinning, etc.) does not reduce stand density.

Early in development of insect-related mortality within stands, trees may die as individuals and become snags. The biology of the cadre of insects that attack Douglas-fir suggests that the larger trees within these stands are the most likely to be attacked and killed. This is unfortunate from both silvicultural and wildfire management perspectives. Snags can rapidly escalate wildfire behavior by spreading firebrands from their tops, represent significant safety hazards during wildfire suppression activities, and ultimately increase accumulations of surface fuels.

As insect populations increase, however, insect-related mortality begins to occur in patches, rather than in single trees. As insect populations explode, these patch sizes can become quite large, such as occurred in Lithia Park in the early 1990's when virtually all of the overstory Douglas-fir were killed. This most typically happens on the most moisture-limiting sites, such as those at lower elevations and/or on southerly aspects within the project area. Insect-related mortality in patches of expanding sizes ultimately encourages the patch to return to the much more fire prone vegetation types that typify earlier successional stages of stand development, particularly if a stand was dominated by a single species, such as Douglas-fir in Lithia Park or in Units 4 and 8. These developing patches or gaps create horizontal discontinuities in fuels, a wildfire management benefit at least for a short time until more fire prone early seral vegetation returns to the site. Dwarfmistletoe infection in Douglas-fir, in concert with insect attack, also has created numerous gaps within the project area.

This process is similar to the disturbance pattern in the pre-settlement era that created a much more aggregated pattern of retention of overstory conifers (such as in Units 34, L, and M). Although the patterns of stand development are similar in both situations, the much more wildfire prone nature of the landscape in the first example makes gap development less effective at reducing wildfire potential, especially since all of the biomass produced by insect-related mortality remains on site (as opposed to being continually reduced by frequent, low intensity fire).

Management to create appropriate stand densities also depends on an understanding of stand development processes. As stands proceed through the typical progression of stand development as previously described, competition for resources between trees steadily increases in a relatively predictable series of stages.

In the first stage, individual trees are free to grow and fully utilize site resources, unaffected by competition from other trees, although they may struggle from competition from shrubs, grasses, broadleaved herbs, and other competing vegetation. Overall stand growth is less than optimal during this stage, as site resources are not fully utilized by developing seedlings and saplings.

Eventually, trees continue to grow until the point where they begin to compete with each other. At this onset of competition, individual tree growth begins to decline and self-pruning begins. During stage 2, there is still less than full site occupancy and total stand growth remains less than optimal.

In stage 3 of stand density development, overall stand growth reaches its potential at relatively full site occupancy. Although individual tree growth is less than in stages stands in stage 3 develop into relatively closed canopies where shortages in light and moisture begin to significantly limit the development of understory vegetation. Size differentiation between trees becomes more obvious as larger, more dominant trees begin to separate in size from smaller, less vigorous trees. In some situations, however, size differentiation is minimal due to excessive stand densities and stand stagnation can result in which entire stands of individual trees significantly decrease in growth and vigor.

A relatively long plateau in stage 3 is typical (see Figure 1), when stand growth is optimized and full site occupancy exists. Eventually, however, stands enter a fourth stage where self-thinning from density-related mortality occurs. Stands in this stage are usually highly susceptible to insect-related mortality in outbreaks that can involve individual trees up to entire stands. Total stand growth decreases as trees die, perhaps increasing growth of adjacent individual trees. Site occupancy can be more variable, particularly as individual trees or small patches of trees begin to die. Stagnated stands that are highly susceptible to attack from bark beetles, as populations of bark beetles can rapidly expand to high numbers where even the healthiest conifers are attacked and killed. Wholesale destruction of a tree species within a stand can occur, such as occurred with Douglas-fir in Lithia Park in the early 1990's and more recently in other interface locations.

Without disturbance, however, some stands continue to develop until a relatively predictable boundary is reached (see Figure 2) that is a theoretical maximum between tree size and stand density. At this boundary point, any additional stand growth is offset by a corresponding decrease in numbers. This boundary line exists for any tree species, and holds true regardless of site quality.

Disturbances, either natural (fire, insects and disease, windthrow, landslides, etc.) or management related (prescribed burning, pre-commercial thinning and release, harvesting, etc.) shift stand densities backward into lower stand densities and fewer trees per acre. Relatively predictable changes in size-density relationships occur, as decreasing numbers of trees generally produces associated increases in growth and diameters of remaining trees (see Figure 2), with subsequent increases in tree and stand vigor as well.

Size-density relationships can be measured in several different ways in order to characterize untreated stand densities and/or to describe desired stand densities to be produced through stand management activities. Basal area guidelines are the most commonly used measurement guiding stand density decision-making. To develop successful basal area guidelines, two indices of stand density—relative density index and

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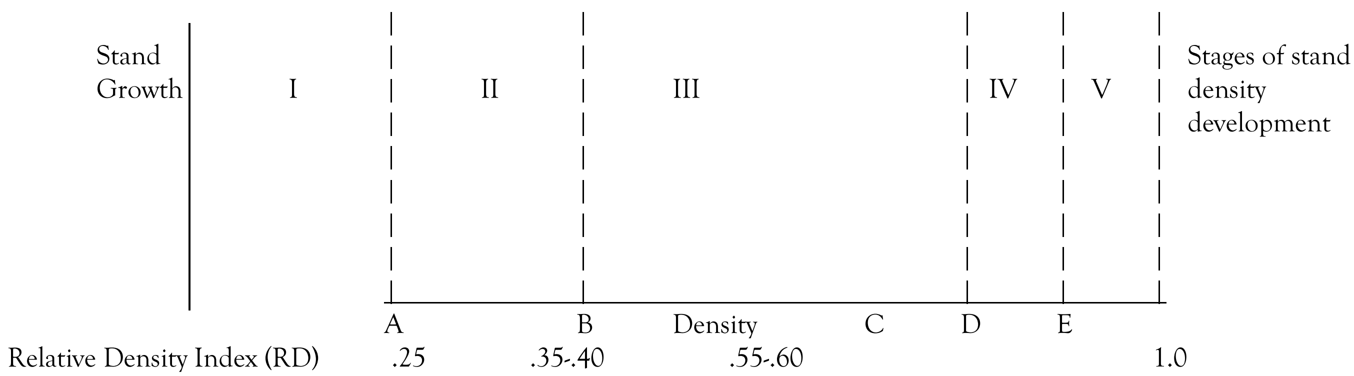

A. Crown closure; onset of competitive interaction; self-pruning occurs

B. Lower limit of full site occupancy

C. Lower limit of self-thinning; initiation of density related mortality

D. Considerable stand stagnation or within-stand mortality

E. Theoretical maximum density for given size

Figure 1

DBH or
Mean Tree Volume

Relative Density
Index

Note: This figure is not all here in this electronic version!!

1.0 theoretical maximum
density

0.55-0.6 lower limit of
self-thinning

0.35-0.4 lower limit of full
site occupancy
0.25 onset of competition

Trees Per Acre

– – – – stand development over time in absence of disturbance.

–– . –– managed stand (with thinning) development over time

Example: Most unmanaged stands start out with high numbers of small trees per acre (A). This obviously happened following intense stand replacement wildfire such as occurred during the 1901, 1910, and 1959 wildfire events in portions of the Ashland Watershed. These stands grow until density related mortality begins to occur (B), at which time trees per acre begin to decrease. As diameter or tree volume continues to increase over time, trees per acre continually decrease (C), along a theoretical maximum density line that stands do not exceed. In managed stands, initiation usually occurs with fewer trees per acre (D). Stands grow (in this case, without pre-commercial thinning) until the lower limit of self-thinning occurs (E), at which time stand density reduction reduces the number of trees per acre to (F), which then allows the remaining leave trees to grow in diameter to (G). In managed stands, unexpected density-related mortality can be avoided.

Figure 2

stand density index—are particularly useful. These indices express the actual density of trees in any stand relative to the theoretical maximum density possible for trees of that size. Values for each of these indices can be determined that relate to the various stages of stand density development previously described. Figure 1 indicates relationships between relative density and the previously described stages of stand density development.

STAND DENSITY STRATEGIES

Management actions, such as thinning and release treatments, can be implemented to create stand densities that optimize wildfire management objectives, such as previously described, particularly if they are coordinated with management of stand structural values. Ideally, stand densities can be maintained within stage III of stand density development (i.e., above RD .35 to .40 but below RD .55 to .60) through periodic removals. This will insure full site occupancy, or encourage the development of it, while maintaining stand densities conducive to stand and forest health (provided significant disease agents are not at work). Stand densities within this range also minimize the development of within-stand insect-related mortality and/or stagnation that occurs at greater RD's. Ongoing patch mortality and subsequent snag development are particularly undesirable results from wildfire management perspectives, as previously described in the section on stand structure.

However, most stand densities in the project area are very high to extreme, well into Stages IV and V of stand density development. Relative density indices (RD) of untreated stands of .70 to 1.0 are typical, indicative of moderately to severely stagnating stands. Individual trees exhibit these density-related effects by small, poorly developed crowns, very high height/diameter ratios, decreasing radial growth rates, susceptibility to insect attack, and increased likelihood of tree mortality.

Relative density can also be used to establish stand densities that fully occupy the sites (RD's between .35-.40 and .55-.60) while preventing initiation of understory vegetation and ladder fuels. These RD's generally corresponds to basal areas that range between 110 to 150 and 160 to 220 square feet per acre in most of the existing stands within the project area. Maintaining these higher stand densities and levels of overstory cover (and restricting understory development), although capable of supporting independent crown fire, can significantly reduce long-term maintenance costs (Agee et al., 1998). The high existing crown base heights in many even-aged cohort #2 dominated stands in the project area (e.g., Units 4, 8, etc.) make this strategy particularly attractive. This can be contrasted with large openings created by helicopter logging in the early 1990's such as in Unit b, in which maintenance management activities in this flank position will have to be ongoing for many years before a less wildfire-prone vegetation develops.

Relative density can also be used to incorporate other values into prescriptions, such as the need to protect geologically sensitive areas. From a slope stability perspective, full site occupancy is highly desirable as it insures maximum root development, root strength, and subsequent soil-holding capabilities. Maintaining full site occupancy as evenly distributed within stands as possible, for as long as possible, prevents development of areas of reduced soil-holding capacity. However, stands of excessive densities encourage insect-related mortality in patches which ultimately increase the likelihood of slope failure as roots decay and decompose. In highly landslide-prone portions of the landscape, maintaining stand densities as close to RD .55-.60 as possible may be an appropriate management response to optimize slope stabilities. Dispersed retention of conifers, as opposed to gap development is generally desirable on those sites where slope stability is a concern. Unfortunately, understocked gaps in steep and/or otherwise unstable portions of the project area could occur and in some cases may have already occurred from management practices such as helicopter harvesting and prescribed burning (such as Unit B), as well as mortality from insects and/or disease (i.e., dwarfmistletoe patches, root disease, etc.).

Although a large range of RD's (.35 to .60) and basal areas (110 to 200+) comprise Stage III of stand density development, it is clear that opposite ends of that range are preferred from wildfire management and slope stability perspectives. Obviously, desired RD's and stand densities can be adjusted to best fit the specific site needs of each location in the project area.

Utilization of stand density indices such as relative density index makes no inherent judgment, however, as to which trees should remain or be removed. Trees to be removed could be the largest in the stand, or the smallest, or any combination in between to achieve an acceptable stand density. It is also important to note that achieving desired stand densities in extremely dense stands within the project area may require several entries to avoid problems such as shock, scale, and lack of structural support (windthrow, tipping over, etc.).Obviously, desired structural characteristics, species composition, presence of disease or other characteristics should be used to collectively determine appropriate leave trees.

A uniform canopy spacing guideline is generally not as effective as relative density/basal area guidelines at reflecting site-by-site differences in complex stand conditions such as found in the project area. Thinning to create crown spacing alone is not as effective a wildfire management strategy as linking it with higher priority actions of reduction in surface fuels and increases in height to live crown (Agee et al., 1998). Canopy spacing as a guideline is also particularly difficult to use in stands that contain multiple cohorts such as are common in the project area.

It is important to note that concerns associated with excessive stand densities previously described do not necessarily disappear simply because management-related lines for retention buffers (such as for riparian habitat, geohazard zones, etc.) are artificially placed on the landscape. For example, limiting sites on City of Ashland forestlands resulted in 75 to 90 percent insect-related mortality of conifers, an obviously undesirable result from a geological/slope stability perspective. Long-term susceptibility to slope failure may have been avoided if light stand density reductions had been allowed and implemented prior to insect infestation. It is suspected that carefully planned stand density management guidelines applied in understory stand improvement "thinning from below" treatments could actively improve long-term sustainability of some geohazard and riparian management zones within the project area. In stands with large enough average stand diameters, appropriate stand density reduction can result in removal of merchantable size trees. These types of commercial thinnings associated with other equally critical understory treatments , could ultimately improve stand vigor and encourage late seral characteristics while maintaining or even improving long-term values associated with these critical landscape locations. Of particular concern within the project area is the increased susceptibility to high intensity wildfire in riparian buffers of excessively high stand densities, particularly those high in the landscape. Not only is critically important protective vegetative cover removed all at once in a wildfire event (as opposed to mortality more favorably dispersed over time), but wildfire is much more quickly and intensely transferred to ridgeline positions. The ecological trade-offs associated with these realities are particularly difficult to compare, let alone decide upon.

SPECIES COMPOSITION

Encouraging changes in species composition is not nearly as critical as implementation of changes in stand structures and densities for achieving wildfire management objectives in the project area. However, several other considerations regarding species composition are important, particularly in terms of maintenance and/or promotion of late seral values. These include (1) change in species composition towards more shade tolerant species, most notably white fir; (2) continued loss of overstory old growth ponderosa pine due to excessive stand densities and associated insect-related mortality; (3) continued loss of Douglas-fir to density-related stress and particularly dwarfmistletoe disease; and (4) species composition and biodiversity objectives.

COMPOSITION ISSUES AND STRATEGIES

1. Change in species composition towards more shade tolerant species, most notably white fir - In the absence of disturbance (fire), the dense understory conifers in cohorts 2 and 3 that have developed in the last century have a much greater percentage of shade tolerant species, particularly white fir, than the older cohorts developed in the pre-settlement era. These older cohorts have a higher percentage of ponderosa pine and/or Douglas-fir, depending on the site. Management strategies that attempt to recreate species composition that reflect the historical range of variation are obviously desirable in this late seral reserve. Creating horizontal discontinuities by removing younger conifers of cohort 3 will likely focus largely on white fir (particularly in the Winburn Ridge area), simultaneously enhancing an important late seral goal in terms of species composition. Understory treatments to encourage Douglas-fir and even ponderosa pine (it occurs rarely as an understory tree in the project area) will help maintain these species in the mix.
2. Loss of overstory old growth pine due to excessive stand densities and associated insect-related mortality - The older 200 to 300+ year-old ponderosa and sugar pine scattered throughout the project area are an incredible, extremely important component of this portion of the late seral reserve. Unfortunately, changes in disturbance history, beginning

with the Euroamerican settling of southern Oregon, have altered stand development patterns much to the disadvantage of these older pines. Disturbance histories changed from frequent and low to moderate in intensity to infrequent events of moderate to high in tensity. As a result, stand development patterns have also changed, most easily noticed by the significant influx of dense understory vegetation of cohorts 2 and 3. These stand structures and excessive stand densities have not only increased the likelihood of demise of the overstory old growth in a fire event, but have also made them extremely susceptible to attack and mortality from bark beetles. Considerable mortality has already occurred and will continue unless a significant reduction in stand densities occurs through manual treatments and/or prescribed burning. Manual treatments are preferred in most situations, at least initially, because the additional stress associated with prescribed fire is avoided. Once these overstory trees are released and gain vigor (i.e., 5 to 10 years) following treatment, it is suspected that they would be able to withstand future stresses such as prescribed burning or minimal attack by bark beetles. The problem is acute in several portions of the project area, most notably on more southerly and westerly aspects such as in the Winburn Ridge area. There are few replacement pines developing in cohort 2 and even fewer in cohort 3, as the shade-intolerant nature of this species makes natural regeneration extremely unlikely in the dense stands that have developed in the last 100 years of fire suppression and exclusion. This lack of replacement trees, coupled with the ongoing loss of mature overstory trees, is significantly changing species composition and subsequent loss of an important late seral value. Even planning for replacement pines to maintain compositional diversity within the historical range of variability will be difficult without creating more open stand conditions. In this case, stand density reductions and associated fuel treatments to reduce wildfire potentials can coincide with long-term late seral objectives of maintaining ponderosa pine in both the short and long term. making long-term replacement of this critical late seral component effectively impossible within a 200-year time frame unless proactive management strategies are undertaken in this project. Once again, it is fortunate that stand density reductions to improve health of these trees can simultaneously be conducted with fuel reduction treatments to accomplish two much needed objectives.

3. <u>Loss of Douglas-fir to dwarfmistletoe disease</u> - Large numbers of Douglas-fir of all sizes are moderately to severely infected with Douglas-fir dwarfmistletoe disease (Arcuethobium douglesii). This is largely an outgrowth of fire suppression activities of the last 100 years and with it a critical mechanism for removal/minimization of dwarfmistletoe disease (Alexander and Hawksworth, 1975; Wicker and Leaphart, 1974; Koonce and Roth, 1980; Hawksworth and Wiens, 1996). Numerous large mature Douglas-fir within the project area are totally consumed by brooms throughout the length of the canopy. These highly stressed, heavily infected trees will likely die within the next 5 to 10 years, probably in part because of their increased susceptibility to bark beetle attack. This has already occurred in a number of locations, creating small gap openings of large, dead, formerly infected Douglas-fir snags. As a result, a significant decrease in the numbers of larger sized trees of this species is occurring—potentially a significant disadvantage from a late seral reserve

perspective. Infected overstory within the project area also threatens the long-term viability of this species as an integral part of developing stands, as understory Douglas-fir become infected and fail to grow to maturity. This result, seen in locations throughout the project area, is particularly undesirable given (1) the long-term change in species composition that may result, and (2) the species' inherent tolerance to fire as they get older and develop fire resistant traits (i.e., thick bark, elevated crowns, etc.). Fortunately, however, Douglas-fir dwarfmistletoe infection within the project area is clumpy in distribution, with some areas devoid of visible infection, while other areas are heavily infected. Ponderosa pine dwarfmistletoe infection is much less pronounced within the project area, usually occurring as a light to moderate infection on scattered trees, often with few, if any, pines infected in the understory.

4. Species composition and biodiversity - From a biodiversity or wildlife habitat perspective, greater species diversity, both within stands and on a landscape level, is desired. For this reason alone, maintaining hardwoods or uncommon conifers, such as sugar pine or incense cedar, in the species mix is important. Hardwoods, however, are generally shade intolerant and are not appropriate candidates for retention once they have become overtopped by developing, taller conifers. Developing more diverse plant species composition in the understories of existing stands, a desirable biodiversity objective, would require significant lowering of stand densities, at least to the point where understocked openings would allow more light, moisture, and other site resources to become available. As previously described, however, this development of understory vegetation (ladder fuels) may conflict with management objectives. Once wildfire potentials have been reduced to more acceptable and manageable levels (on both a project and watershed level), then more significant stand density reductions and/or gap creations to promote greater plant species diversity could be implemented in appropriate locations, such as on the more stable portions of the terrain within the project area.

OTHER MANAGEMENT ISSUES/CONCERNS/OPPORTUNITIES

(compiled by Marty Main with Tech Team input)

GEOLOGIC/SLOPE STABILITY

Unfortunately, development of understocked or nonstocked stand openings as a result of insect-related mortality, helicopter logging, spots of higher intensity in prescribed burning, and/or any other type of vegetation removal can change flow regime (the character, timing, and distribution of flows) and water discharge from a watershed. This occurs in two primary ways: (1) increases in surface or overland flow of water, and (2) increased potential for development of debris slides, debris torrents, or other major landslide events. These have potentially serious consequences not only because of increased sediment entry into stream system and subsequent impacts on water quality and aquatic resources, but also because of increased potential for damage from flood stage flows.

When vegetation is removed from any site, decreased interception and evapo-transpiration in the absence of canopies produces a simultaneous increase in overland flow. Not only does this allow greater amounts of water to enter the stream system, but also allows it to occur much faster. In addition, surface erosion can be increased, providing greater levels of sediment entry into stream systems. Perhaps most importantly, the increase in ground water available to unstable or potentially unstable terrain can increase the potential for landslide activity over time.

Patch-related vegetation removal can also increase the potential for debris slides, debris torrents, and other major slope failures as roots die, rot, and decompose, losing their inherent ability to hold soil in place. Typically, the possibility for slope failure is greatest five to ten years after trees have died.

Currently, the high percentage of vegetative cover in the Ashland Creek watershed forestlands suggests there are minimal effects on flow regimes due to the relatively small and scattered nature of openings that exist. It is likely that significantly more openings could exist and still be within the historic range of variability for the watershed as a whole. It is likely that additional openings, related or unrelated to management, could occur without significant changes in flow regimes, as long as they are kept individually small, not concentrated in any one portion of the management area, avoid critical areas, and below a cumulative threshold value for the watershed as a whole. Nonetheless, it must be recognized that management decisions that actively encourage removal of patches of vegetation (patch clearcutting) or encourage insect-related mortality (no treatment), particularly openings of larger sizes, can potentially carry associated potential unfavorable consequences from a geological/slope failure/flow regime perspective. Implementing stand density reduction activities that maintain densities and distributions of trees sufficient to prevent, or at least not accelerate, slope failure is a difficult and complex management challenge, particularly given that those levels of stand density that maintain adequate rooting density and strength and subsequent slope stability have not been clearly established by research. This suggests that creating vertical discontinuities in fuels within stands is probably more desirable within the project area than creating horizontal discontinuities through our management actions (patch cutting, gap development through hot spots in prescribed burning, gap development from dwarfmistletoe-induced and/or insect-related mortality, etc.). It may be possible to delineate those portions of the project area in which gap development and its associated short-term fuel discontinuities would be more acceptable (ridgelines, gentler slopes, etc.) and/or less acceptable (headwalls, geohazard zones 1 and 2, steeper slopes, etc.).

It must be noted that openings and/or patchy stand structures are not negatives to be avoided at all costs, particularly if considering the longer time frames and/or larger frames of reference typical of watershed level management. Creation of more diverse vegetational structures may be able to be initiated once a more fire resilient landscape has been created by improving stand conditions from silvicultural (improved stand vigor, reduced susceptibility to insects) and wildfire management (reduced fuel loading on an area-wide basis) perspectives. In fact, prior to the significant alteration of disturbance regimes initiated beginning with European settling of the area, it is likely that frequent, low to moderate fire in the Ashland Watershed created and maintained numerous openings of various sizes scattered across the landscape, such as exhibited structurally by the older cohorts throughout the project area. It is also clear that a return to a more heterogeneous combination of stand structures and conditions in the Ashland Watershed is a desirable future condition from many perspectives, including wildfire management. Ultimately, watershed level management may attempt to create more openings, dispersed over space and time, particularly if acceptable amounts and locations can be determined from hydrologic, later seral, geologic, and other perspectives.

Commercial Units with Hazard Zone 2 Acreage

Unit #	Alt. 4 Treatment	Alt. 5 Treatment	Approx. % in HZ2	Total Acres in Unit	Approx. Acres in Hazard Zone 2
1	DM	FBM	15	23	3.5
3	DM	Flank	35	10	3.5
4	DM	Flank/DM	40	31	12.5
6	DM	DM	30	9	3
8	DM	FBM/Flank	8	20	1.5
11	DM	Flank/DM	15	5	.75
13	DM	Flank/DM	20	10	2
14	DM	Flank/DM	25	15	3.75
16	DM	Flank/DM	10	16	1.5
21	DM	FBM/Flank	40	12	5
23	DM	FBM	15	19	3
31	DM	DM	20	6	1.2
32	DM	Flank/DM	30	19	6
34	DM	Flank	20	69	14
39	DM	Flank/DM	5	31	1.5
40	DM	Flank/DM	55	11	6
Totals	**na**	**na**	**na**	**306**	**69**

PRESCRIBED BURNING

Prescribed burning is also used to achieve desired manipulations and reductions in vegetation and fuels to meet pre-designated objectives. In the Ashland Creek Watershed, prescribed fire has been used as one of the primary methods of fuels reduction on U.S. Forest Service lands to achieve wildfire management objectives. The use of prescribed fire is also important in that it returns a critical functional process and the primary disturbance mechanism to ecosystem functioning in the Ashland Creek Watershed.

To date, the use of prescribed fire has accomplished several important vegetation and fuels management objectives, most notably reduction in surface and ladder fuels (i.e., vertical structural discontinuities), with development of occasional "hot spots" and subsequent gap development (i.e., horizontal fuel discontinuities).

However, the very explosive nature of the fuel profiles within the project area and the watershed as a whole makes it much more difficult to utilize prescribed fire to achieve precise vegetation manipulation objectives, such as accomplishing fuels management while minimizing gap development and/or preventing damage/mortality of stressed overstory old growth conifers. This strategy of implementing appropriate silvicultural cutting or prescribed burning can significantly speed the movement towards desired stand conditions and even hasten the use of prescribed fire in a way that more closely mimics natural ecosystem functions of frequent, low to moderate intensity fire (Weatherspoon, 1996). Without silvicultural pre-treatment, it is suspected that it could be quite difficult to accomplish more precise stand management objectives in very dense, untreated stands with heavy uniform fuel profiles (e.g., Units BB, C, and 10) or preferred mature overstory trees with dense understory ladder fuels (e.g., west side of Winburn Ridge). Loss of mature overstory ponderosa pine, in part as a result of additional stress associated with prescribed burning, should be avoided if at all possible (e.g., southerly aspect flank positions south of Unit 5, spots on the west side of Winburn Ridge, etc.).

In many situations within the project area, an initial manual treatment, even if only around preferred overstory old growth trees, would be desirable. Once completed, a less costly and much more precise prescribed burning program could be more easily implemented. Building increasing fire resiliency into the Ashland Creek Watershed on a landscape level would hopefully allow the opportunity to one day incorporate intentional creation of gaps to more closely emulate gap stand dynamics within the range of historical variation without significantly aggravating wildfire potentials. At that time, prescribed burning would be the ideal tool of choice. Until that fire resiliency is more completely built into the Ashland Creek Watershed landscape, a more careful and judicious use of prescribed underburning may be desirable. Prescribed fire may be most effectively used in places where hot spots are either less likely to occur (e.g., dense stands dominated by cohort #2 with little understory or ladder fuels) or less of a concern when they do occur (gentler, less landslide-prone slopes; stands without a significantly stressed old growth overstory component, etc.). As of this writing, specifics concerning when and where to utilize and/or restrict utilization of prescribed fire had not been clearly determined by the Tech Team.

SNAGS

Snags, particularly of larger diameters, have well-known and critically important wildlife habitat values. Snags can also significantly compromise wildfire suppression activities in a major wildfire event by (1) rapidly escalating rate-of-spread through firebrand production at their tops, even spreading fire over pre-established shaded fuelbreaks, and (2) representing a significant safety hazard that can limit or even prevent personnel deployment into critical fuel management zones.

At the time of this writing, the Tech Team had not come to agreement on exactly how to balance these competing objectives. It is suspected that some level of snag retention can be maintained within the project area, particularly if they are gradationally distributed (i.e., in horizontal directions, increasingly more snags could be retained as one moves farther from ridgeline locations and into steeper areas where firebrand production will be less critical and personnel less likely deployed; in vertical directions, shorter snags could be retained in higher slope positions within fuel reduction zones).

COARSE WOODY DEBRIS

A similar conflict in competing values exists between retention of coarse woody debris for its numerous important long-term site productivity and other values, and the negative impacts that result from a wildfire management perspective when excessive amounts of large woody debris exist in fuel reduction zones. Conversations with Tom Atzet, U. S. Forest Service Regional Ecologist for the area, provided the following information based on his ecology plots throughout the Siskiyou Mountains. In relatively undisturbed forests, an average of 12 to 15 pieces (at least 20 feet long and greater than 20 inches diameter) per acre in the Douglas-fir series, 10 pieces per acre in the ponderosa pine series, and 25 pieces per acre in the white fir series existed. Ranges included 5 to 30 pieces per acre on the Douglas-fir series and 10 to 40 pieces per acre in the white fir series. Tom emphasized that there were "no right answers," but rather that a broad range of types, decay classes, and sizes existed across the landscape. He emphasized that higher amounts would normally have been expected in riparian areas and lower amounts in more fire-prone portions of the landscape. Even with this information, it may be hard once again to balance competing objectives. As of this writing, the Tech Team had not resolved these issues, although it is suspected that at least some level of retention of coarse woody debris is possible in fuel reduction zones without severely compromising wildfire management objectives.

LARGE TREES

Large conifers above some specified diameter have been identified by some as an important value within the project area of the Ashland Watershed Protection Project. Their value occurs in several arenas. Most notably, large trees are critical structural elements of late seral reserves and serve many varied functions, as well as being sites for numerous others. They represent important ecological values that can extend over long time frames due to their inherent longevity. Much has been learned and written about the ecological importance of large trees and need not be elaborated upon here.

Large trees also have important spiritual and other more humanistic values.

Lastly, large trees have political value in that they not only capture the imagination and heartstrings of most individuals, but are visualized and quantifiable, particularly in a political setting.

Large trees throughout the project area are also under considerable threat of imminent demise in amounts that likely exceed the natural mortality rate in a healthy, functioning, late seral ecosystem. Considerable numbers of these large trees have already died. This pattern will continue, perhaps, at alarming rates from insect and disease-related mortality alone, most notably stress related bark beetle attack in large ponderosa pine and dwarfmistletoe infection in large Douglas-fir. Perhaps the biggest threat of demise to large trees in the project area and the watershed as a whole is the threat of high intensity stand replacement wildfire over large areas. Even moderate and low intensity fire can contribute to mortality of highly stressed individual trees, most notably old growth ponderosa pine.

As the starting point for this discussion, the Tech Team is in agreement that when considering the issue of large trees, the overall objective is to maintain a vigorous, old-growth overstory. In considerable part due to the fact that sizeable percentages of the large trees in the watershed are under high threat of mortality, the AWSA Tech Team acknowledged that "saving large trees by not cutting any" was, at best, a misrepresentation of ecological reality in the current condition of the project area, and in much of the Ashland Creek Watershed as a whole. Perhaps more importantly, however, the Tech Team chose to focus on the ecosystem processes and functions that trend vegetation towards late seral values, rather than focusing on one outcome or result among many, namely large diameter conifers. We do, however, emphasize that when it comes to vegetation manipulation, the predominant method of retaining late seral values is through removing "small" and "medium" sized, relatively younger vegetation. Lastly, the Tech Team felt that in some situations significant ecological and potential late seral reserve values could be retained or even promoted by removal of very specific larger trees individually analyzed against criteria on a site-by-site basis.

Four primary situations exist in the project area in which the tech team felt that the cutting or cutting and removal of large trees could be considered for fire hazard reduction purposes. Each situation has an associated set of ecological benefits and tradeoffs. These benefits and trade-offs should be as fully displayed as possible so that a reasoned decision can be reached. This process is complicated by both incomplete ecological knowledge and difficulty in assigning relative importance to each benefit/trade-off. Therefore, it is important to increase our ecological knowledge of the sites in question prior to prescribing large tree removal.

In most situations that operate under this level of uncertainty, it is most convenient and perhaps even appropriate to "table the issue for now" and wait for more knowledge and/or better decision-making framework and/or possibilities. Certainly, it would be easy to capture the support of significant portions of our concerned public and community, including many in our larger group, by adopting such a stance. However, the Tech Team felt that such a stance would be an inappropriate response at this time for two important reasons:

(1) The serious long-term negative trends in ecosystem processes within the proposed project area suggest a decline in late seral values in the immediate future, including the demise of many large trees.

(2) The opportunity afforded AWSA to interface in some constructive capacity with the U.S. Forest Service demanded that these issues be addressed ***now***, with all the sincerity, integrity, and humility that we could muster.

The four situations within the project area in which the Tech Team felt large tree removal for fire hazard reduction could be considered were as follows:

(1) Dead and/or dying merchantable large conifers. Significant numbers of large conifers in the project area are dead, or dying (will be dead within 1 or 2 years). Although an accurate delineation of trees in the second category has to date included a large amount of subjective analysis, recent research is rapidly defining measurable characteristics that can help determine potential mortality or releasability of mature conifers. Nonetheless, in portions of the project area, the number of large conifers dead or expected to die will contribute to fuel accumulations and distributions that will significantly compromise wildfire management objectives, as well as likely exceeding an amount of snags and/or large woody debris needed to maintain healthy ecosystem functioning and/or within the historical range of variability. Note however, that this is not the same as stating that this level of snags and large woody debris will be of sufficient "quality" and spatial distribution to maintain sufficient habitat for all species that depend upon them.

(2) Larger conifers in suppressed or intermediate crown classes under more dominant and vigorous overstory conifers. Removal of these trees could improve health and vigor of adjacent overstory conifers, encouraging their long-term survival and continued contribution to wildfire management and late seral values. Care would have to be taken to not impact clump dynamics, an emerging concept in which clumps of mature conifers may actually over long periods of time develop in-clump strategies of cooperation and mutualism. Excessive alteration of clumps through more classical stand density reduction strategies may actually encourage shock and decline of desired overstory dominants, particularly on harsher, less productive sites where one or more site resources are in critically short supply.

(3) Rapidly declining larger trees in extremely dense, uniformly stocked stands dominated by cohort #1 and #2. Portions of the project area are dominated by stands that currently support good to excellent structures from a wildfire management perspective, but are excessively dense (Relative Density = 0.7 to 1.0) and under a rapid state of decline. Commercial thinning to remove the least vigorous of the trees in these stands, regardless of size, could help improve the health and vigor of those stands and their subsequent contribution to late seral values, while retaining or perhaps even improving upon structural characteristics favorable from a wildfire management perspective.

((4) Heavily dwarfmistletoe infected Douglas-fir. Numerous wildfire management and late serial values, both short-term and long-term, can be compromised, in some cases seriously, by retention of heavily infected Douglas-fir. However, it is very important to also note that many important wildlife habitat and late serial values are also represented in dwarfmistletoe-infected conifers. These will be discussed elsewhere in the Tech Team document, but in many cases may make balanced decision-making regarding tree removal difficult (i.e., concerns from varying perspectives are both valid and competing).

Important changes in species composition (i.e., ongoing loss of Douglas-fir on a stand level basis) as a result of dwarfmistletoe disease, as previously described, have significant negative consequences from a late seral perspective. From a wildfire management perspective, stands with significant infestations of Douglas-fir dwarfmistletoe are also undesirable. Fuel loadings in these stands are typically higher (Koonce and Roth, 1985). Fuel arrangement and distribution is also changed with potential negative consequences. Large, mature Douglas-fir with brooms throughout the length of the canopy can pose significant problems in a wildfire event, as they can rapidly convert ground fire to crown fire, as well as acting as torches, spotting fire far ahead and rapidly increasing rate of speed. When infected overstory trees occur in clumps of mature overstory, the likelihood of additional within-clump mortality is increased. Heavily infected trees are likely to die within the next 5 to 10 years, further contributing to large snag development, an obvious disadvantage from a wildfire management perspective.

Management options rely on a careful delineation of dwarfmistletoe infection by location and stage of infection (dwarfmistletoe rating system), with perhaps a flexible management protocol depending on the age and vigor of the infected tree, degree of infection, and opportunities to reduce wildfire potential by removal and/or promote other important values through retention. Several features of dwarfmistletoes make them ideal candidates for silvicultural management strategies (Johnson and Hawksworth, 1985): (1) they are obligate parasites that require a living host to survive, (2) dwarfmistletoes are generally confined to a single host species, (3) dwarfmistletoes have long life cycles and generally slow rates of spread, (4) dispersal of dwarfmistletoe seeds is generally of short distances, seldom more than 50 feet, (5) dwarfmistletoe infected trees are usually easy to detect. Pruning, an often suggested strategy for controlling dwarfmistletoe infection, is usually not recommended in large commercial stands due to the cost of climbing/pruning and because repeated treatments are usually necessary to remove latent infections (Hawksworth and Wiens, 1996). For example, mature Douglas-fir with suspected latent infections of dwarfmistletoe were retained throughout portions of Units 1-20 during the helicopter logging of the early 1990's, and have since had explosions of infection in these more open stand conditions. Heavy infection of understory Douglas-fir has resulted, with serious long-term implications as previously described Further, although pruning has been used successfully to improve vigor and long-term survival of highly valued trees and/or specific trees needed for stocking, these results have only been reported for ponderosa pine, with little similar research for Douglas-fir (Hawksworth and Wiens, 1996). If experimental pruning of Douglas-fir is desired, the best chance for success exists in vigorous cohort 2 and 3 trees with dwarfmistletoe ratings of 1-3. Retention of larger, mature, heavily infected Douglas-fir is particularly undesirable from a wildfire management perspective in shaded fuelbreaks or other ridgeline areas; retention may be more acceptable as one moves further away from these critical wildfire management locations. Encouraging other species in these locations is also a viable management option that may allow retention of infected trees. Surrounding infected overstory Douglas-fir with other species of the same cohort can help limit spread, but also make those other desirable trees available for damage/destruction if fire is converted from ground fire to crown fire through the vertically continuous brooming on a Douglas-fir. Similarly, encouraging another species (most likely white fir) in the understory underneath the infected overstory Douglas-fir will simultaneously encourage further, less desirable shifts in species composition from a late seral perspective (i.e., towards more white fir). It must be noted that key to any final decision-making regarding an individual tree or trees' contribution to wildfire behavior will depend largely on the degree and location of infection. For example, large distances between the ground and the first broom (distance to live crown base) could significantly decrease likelihood of ignition.

It is very important to note that the Tech Team had begun an initial analysis of these situations and wrestled with the issues but had not, at the time of this writing, reached a collective agreement on the appropriate balancing of trade-offs for each of these four situations. It was generally agreed, however, that creating a diameter class of any predetermined size to use as a guideline limiting cutting has a limited ecological basis within the project area. Suggesting that this type of simplistic prescription could be uniformly applied to maintain or improve late seral values flies in the face of our understanding of the inherent diversity and complexity of existing stand conditions and ecological processes in the project area.

EXTRACTION OF CUT TREES.

What vegetation will be cut is driven by the desire to reduce the risk of large scale, high-intensity wildfire, guided by concern for soil/slope stability and water quality priorities as well as late-successional reserve objectives. What to take out must meet a different standard. Extraction of cut trees will be allowed when all of the following conditions are met, or when the amount of material produced by cutting will lead to an unacceptable fire hazard.

1. The downed tree is not needed on-site for soil stability; wildlife needs (particularly the need for certain quantities of coarse woody material); long-term soil productivity, and;
2. Can be removed economically and without damage to the site (no more than 5% soil disturbance) or residual trees (little or no damage to residual trees).

SHADED FUEL BREAKS AND LANDSCAPE LEVEL ISSUES

The limited amount of time spent by the Tech Team raised several landscape level concerns/possibilities. Although time did not allow a more in-depth analysis by the Tech Team, the following landscape level concerns/possibilities were delineated.

(1) The possibility for replacing a shaded fuelbreak treatment in Unit 33 with a larger, area-wide treatment of fuels. Existing pre-treatments (prescribed burning) in the vicinity and proposed treatments suggest that the width of the fuel treatment area could be one-quarter mile or greater even without vegetation manipulation to shaded fuelbreak standards. Given that all fuelbreak segments don't necessarily have to be connected for a fuelbreak strategy to be effective (Finney et al., 1998; Agee et al., 1998), it is possible that area-wide treatments could suffice at this time in this topographical location.

(2) Shaded fuelbreaks on wider, broader ridges are more effective than those on narrower, knife-like ridges, particularly those above steep topography such as Units 1 and 35. Note that each of these two proposed narrow shaded fuelbreaks are adjacent to areas of dense vegetation, which will further reduce the probability of effectiveness by an unknown amount.

(3) Fuels management in the Research Natural Area is a critical landscape level objective if fire resiliency and wildfire management effectiveness are to occur in the Ashland Creek Watershed. In particular, the lack of treatments proposed for the RNA seriously compromises the potential effectiveness of the fuels treatments along Winburn Ridge, especially the narrow shaded fuelbreak of Unit 35. Preliminary discussions with Sarah Greene, Research Natural Area coordinator for the Region, suggest that the possibility for implementation of fuels treatments, although difficult, is worth considering and exploring. Valuable research information could be gained in the process.

(4) All areas selected for vegetation treatment and fuels management by the U.S. Forest Service are important areas topographically from a wildfire management perspective. The Winburn Ridge location is an important area topographically in that fuels treatment, if effective, could compartmentalize intense, stand replacement wildfire hopefully into only one subwatershed, and not both subwatersheds of both East and West Fork simultaneously. It is important to note that recent development in computer fire simulation technology (Finney, 1998) is beginning to allow much better possibilities for evaluating fuel treatments given variations in both suppression levels and fuel conditions on a landscape level.

COMPUTER MODELING TOOLS

Clearly, there was insufficient time to develop prescriptions for all the units/ stands/structures in the project area using the framework described in this report. However, several areas previously mentioned provide examples of how this framework can be utilized to create more precise accomplishment of multiple objectives.

For example, in Unit 8 (and likely within other areas of the project area), existing stand structures provide a good vertical vegetational profile from a wildfire management perspective—limited surface and ladder fuels, a high crown base, and small crowns.

However, the dense, uniform crowns are undesirable from a wildfire management perspective. Further, individual tree health is poor as evidenced by excessive stand densities, small poorly developed crowns, excessive height/diameter ratios and low radial growths. Thinning to appropriate densities and full site occupancy as determined by utilization of relative density index can be done to not only improve stand health and maintain favorable stand structures well into the future, but prevent excessive encroachment of understory ladder fuels as well.

Similarly, on the west side of Winburn Ridge, the aggregated structure of the critically important overstory ponderosa pine/Douglas-fir maintained fire resiliency in the pre-settler era of disturbance patterns. However, current stand conditions in this era of infrequent but high-intensity disturbance reflect a much more homogeneous fuel profile, both horizontally and vertically. Overstory pines, a critical late seral reserve component, are at significant risk of mortality from both density related insect mortality and potential stand replacement wildfire. Stand and fuels management prescriptions to re-create more favorable aggregated stand structures, reduce stand densities to acceptable levels, and improve species compositions can be developed if these stand characteristics can be inventoried and analyzed on a stand-by-stand basis.

Data collected from installation of Organon growth and yield plots during several quick visits to these sites provide examples of the kind of outputs that could be created. For Unit 8, Organon outputs (Appendix A, figures 3 and 4) clearly indicate poor overall tree condition, with an average crown ratio of only .227 (figure 3a). In Figure 3b, the relatively even age and uniform size distribution is clearly displayed. Favorable stand structure is visually displayed in Figure 3c, with limited understory development and high average crown base heights (45 to 55 feet). Organon will allow thinning prescriptions to be implemented to create more optimal stand densities (e.g., thinning from below to a desired RD = .45), producing an array of outputs including projected volumes from the thinning operation. This new stand can then be grown to simulate the type of stand structures and densities that might be expected in the future.

Organon outputs for a sample plot on the west side of Winburn Ridge also visually and graphically displayed important stand and wildfire management considerations. Unlike Unit 8, multiple cohorts creating a uniform vertical fuel profile are clearly displayed in Figure 4a. Basically, crown fuels are solid from about 6 feet (effective crown base height) to 150 feet. Figure 4c clearly shows that ponderosa pine, which comprises two-thirds of the total stand basal area, occurs primarily in trees 18 inches or larger, with almost no recruitment of future ponderosa pine in the younger age and size classes. Figure 4b graphically displays serious forest health concerns—a relative density index way above the theoretical maximum (1.0) and a low mean crown ratio. The likelihood of retaining the prized ponderosa pine given these scenarios isn't good.

Obviously, there are serious limitations in computer analyses such as that provided by Organon or other growth and yield programs. For example, the above data was produced with far too few plots for statistically accurate predictions (only one plot for the west side of Winburn Ridge!). Too, Organon's predictive capabilities are compromised in multi-cohort stands, particularly those with trees older than 125 years. Nonetheless, it can be used in conjunction with more subjective analyses (particularly from fire management personnel) and/or vegetation classification systems (i.e., plant associations) to produce prescriptions that may more effectively optimize wildfire management objectives while minimizing impacts to, or even promoting, other values and/or resources.

Another tool available for analyzing the effectiveness of various fuel and stand treatments is the use of fire area simulators such as FARSITE (Finney, 1998), a deterministic model for simulating the spatial and temporal spread and behavior of fires under variable conditions of weather, topography, and fuels. This is particularly important given that it is very difficult to scientifically test the effectiveness of various fuel and stand treatments on subsequent wildfire behavior. Van Wagtendonk (1996) used FARSITE to make projections about wildfire behavior in Yosemite National Park under a wide range of scenarios. A similar analysis could be done for the Ashland Creek Watershed. This could greatly facilitate analysis of not only the effectiveness of proposed treatments but also the trade-offs and potential benefits/impacts associated with implementation of these treatments.

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PLANT ASSOCIATION ASSESSMENT

(written by Richard Brock)

An assessment of plant community types in the proposed project area is essential if long term design objectives and ecosystem integrity are to be maintained. The Ashland watershed contains a wide assortment of plant communities, each of which has a unique succesional pathway and response to disturbance. By understanding the ecological trend within each plant association, it is possible, in most cases to design an effective long term strategy that meets both fire management and ecosystem goals. Outlined below is a brief inventory of some of the plant associations which we have observed in the proposed project area with obserevations on disturbance response and intervention alternatives.

EXAMPLES OF PLANT ASSOCIATIONS AND VIABLE STRATEGIES

Ponderosa Pine – Douglas Fir
Douglas Fir – Ponderosa Pine / Poison Oak
Representative Units: C,CC
These sites are hot and dry at the lower elevations on southerly aspects. The overstory canopy is typically scattered/open. The understory is patchy with large areas open and filled with dense whiteleaf manzanita.

The natural potential in these areas is for a Ponderosa pine / savanna with Idaho fescue and California fescue dominant in the grass layer. This type of vegetation is naturally fire tolerant and in fact tends to provide a natural "fuel-break".

A combination of manual treatment and underburn followed by grass seeding could create the desired stand characteristics over a period of 10-20 years. This proposal recommends seeding of appropriate native grass species in such areas to stabilize surface soils and restore savanna-form forest types in areas where such types occurred historically. Underburn without any pretreatment is likely to cause unacceptable levels of mortality to the overstory trees due to the intensity of fire in the manzanita.

Douglas Fir/ Dry Shrub
Representative Units : 8, 9, Z

These sites are intermediate in moisture and typically support fairly dense stands of nearly pure Douglas fir with madrone and some black oak. The shrub layer is a mix of poison oak, ocean spray and tall Oregon grape. Grasses are common including California fescue, California brome and blue wildrye. The current typical undisturbed stand has fairly sparse sapling shrub and herb layers but with disturbance grasses increase and, as light increases (e.g. openings such as fuel breaks), the shrub layer can become dense and Douglas fir saplings occur in patches.

The natural potential for these sites is a full canopy cover with sparse understory well into late succesional stages. As these stands develop into old growth and form canopy gaps, Douglas fir and madrone regeneration will occur in openings. Because this stand type has no white fir, it is unusual for an understory to develop until canopy gaps occur.

Maintenance of full site occupancy and a healthy closed overstory should keep shrub and sapling development to a minimum while encouraging some increase in grass cover. This structure type would be highly effective in minimizing detrimental fire effects and would be very low-maintenance. Opening of this type (e.g. fuel break or flank prescription) would encourage robust shrub and sapling development leading to the need for repeated intervention if fire tolerance is to be maintained.

White Fir-Douglas Fir / Woodrose

Representative Units: 13, 14, 15, 16

This type is moist and warm and highly productive (high site index), typically occurring on northerly and easterly aspects at moderate elevations. It supports a diversity of species and is one of the community types that becomes what we usually consider when we think of classic "Old Growth". Typically Douglas fir dominates the early seral stages and then, as the stand develops, comes to dominate the overstory. In later succesional stages, white fir grows into the understory with Douglas fir also maintaining a presence particulary in open spots. Madrone is co-dominant and can become dense in some stands. Dwarf mistletoe is often abundant in the overstory Douglas fir. The shrub layer is variable but usually fairly dense with oceanspray, hazel, snowberry and dwarf Oregon grape dominant. In an undisturbed state, this type tends to develop multilayered canopies. When the canopy of this type is opened-up through fire or cutting disturbance the response is a flush of shrub, madrone and Douglas fir seedlings.

From a fire management perspective this is the most difficult plant community to work with because the high site productivity and mix of species ensures that a high biomass will be maintained with abundant ground and ladder fuels regardless of treatment. If high canopy closure is maintained and frequent careful understory treatments are performed, it may be possible to keep the shrub layer trending toward low species and the tree regeneration to a minimum. Unfortunately many of the units in this plant association are already heavily disturbed and with dense understory vegetation. Underburning through these areas will cause significant mortality to the overstory trees and lead to another flush of regeneration of trees and shrubs.

White Fir / Dwarf Oregon Grape

Representative Units: 32, 38 and parts of 39,33,34

This type is moist and cool, typically occurring on northerly and easterly aspects at moderate elevations. It supports a fairly high diversity of species (not as high as the previous type) and is the other community type that becomes what we usually consider when we think of classic "Old

Growth". Typically Douglas fir dominates the early seral stages and then, as the stand develops, comes to dominate the overstory. Dwarf mistletoe is common in the overstory Douglas fir. In later succesional stages, white fir grows into the understory often becoming quite dense. The shrub layer is usually sparse to moderate with dwarf Oregon grape, oceanspray, snowberry and serviceberry. The grass layer is sometimes fairly well developed with forest brome and western fescue.

This association develops into the typical "two-layered" stand with a high canopy and a dense regeneration cohort. This type of structure is fairly amenable to management for fire-tolerance andd should be maintained by maintaining a high canopy closure (e.g. full site occupancy) and performing periodic underburns. When canopy gaps are created through fire or cutting the response is typically a rapid growth of grasses and low shrubs with abundant Douglas fir regeneration.

White Fir / Snowberry
Douglas Fir – White Fir / Snowberry
Representative units: Parts of K, L, M, 34,33,39
These associations are dry and cool and occur on the west and south aspects at higher elevation. The outstanding feature is a canopy dominated by ponderosa pine with Douglas fir co-dominant. These overstory trees can be up to 300 years old on these sites with diameters up to 6 feet. The understory develops with a mix of white fir, Douglas fir and pine in dense patches. This regeneration layer crowds and stresses the overstory trees leading to frequent mortality in the older trees. Eventually, if left undisturbed, white fir and Douglas fir will become the dominants in the overstory. The herb/grass layer is usually fairly sparse with occasional Idaho fescue and an assortment of both dry-site and moist-site species including two "management species", *Silene lemmonnii* and *Hieracium greenei* which are both fairly frequent in these stands.

Under a natural fire regime the understory trees were kept at low levels allowing the overstory pine to thrive. It is probable that the grass layer was fairly dense at one time with a mix of Idaho fescue, western fescue and California fescue; this grass cover served to keep the surface soils stbilized. This is the classic ponderosa pine/ savanna structure.

With careful intervention and a combination of manual treatment, controlled burning and grass seeding, the pine/savanna structure can be restored. Currently the ladder fuels in these stands are quite developed and underburning without careful pre-treatment will cause either 1) unacceptably high mortality to the overstory an high levels of surface erosion or 2) very limited mortality to understory trees (i.e. non-effective treatment).

WILDLIFE CONCERNS & RECOMMENDATIONS

Submitted by Laurel Reuben

In the name of Fire Hazard Reduction, wildlife habitat management *will* happen in the Ashland watershed. All of the activities proposed in the Ashland Watershed Protection Project (AWPP), as well as those proposed by the Ashland Watershed Stewardship Alliance (AWSA), will affect wildlife within the watershed, and beyond. Here, as in all land management planning efforts, a first task is to determine which species, habitat attributes, ecological processes, and combinations of the above we intend to feature in our planning. This can also be one of the most difficult tasks, as presence of equally at-risk species, limited ecological understanding, and restrictive time frames all influence the planning process.

Fortunately, the Ashland watershed is within a designated Late Successional Reserve (LSR), for which management is mandated to "…protect and enhance habitat for late successional and old-growth forest related species including the northern spotted owl." (Northwest Forest Plan 1994). This alone provides helpful guidance and support for planning within the watershed. However, LSR management in combination with fire hazard reduction is a tricky dual-order.

Within the watershed, surveys have been conducted or are planned for those species or groups of species (guilds) whose status mandates such investigations. Additional and expanded surveys, as well as long term monitoring, are needed for more informed planning. These efforts would determine presence or absence, distribution, and population trends of many wildlife species of concern. This includes not only those species or guilds that have been given special federal, regional, state, and forest listing, but also those who are being closely monitored because their status for listing seems imminent.

Because this is a municipal watershed, with an extensive urban interface zone, there is an implied urgency and priority for fire hazard reduction, above the need for gathering baseline data and setting up adequate monitoring programs for wildlife. Some commonly used fire hazard reduction methods, particularly prescribed burning, have not been fully studied in terms of their affects on several species of concern.

There are, however, ample observations, widely recognized caveats, and data that, combined, direct us to act cautiously on behalf of featured wildlife species, as well as whole systems and processes, within the Ashland watershed. This is underscored by the *Northwest Forest Plan - Record of Decision* for "Survey and Manage" species. This cumulative knowledge and direction highlights some key features, having important implications for wildlife within the watershed. Those features include, but are not limited to the following: The watershed is part of a larger landscape that serves as a key migration corridor between the Cascade and the Siskiyou ranges. Decades of fire suppression have impacted wildlife habitat types and distribution throughout the West. There are documented, rapid declines in the populations of several neotropical migratory and resident bird species that are known to, and suspected to, inhabit the watershed.

Fortunately, both fire hazard reduction and some LSR management objectives can be met through the same vegetation manipulation and disturbance activities (e.g. thinning and pile and/or broadcast burning). Thinning of dense understory will, for example, immediately improve forest raptor hunting and foraging habitat. In younger stands, thinning will initiate their development into more structurally and vegetatively complex stands that will support a greater diversity of wildlife species than currently uses them. Thinning and broadcast burning could also serve to convert dense stands to fully functional late successional stages more quickly than if we left them alone.

This municipal watershed holds a Research Natural Area (RNA) at its core, contained within an LSR, all within a recognized "Globally Outstanding Ecoregion," as the Klamath-Siskiyou region was recognized by the World Wildlife Fund earlier this year. These functions and designations direct us to pay close attention to our affects on the area, over time and within a larger landscape.

RECOMMENDATIONS

The following recommendations are intended to: 1) meet the LSR mandates; 2) respond to current knowledge and assumptions about old growth-associated and other wildlife habitat use and population trends; 3) recognize the need for ecological restoration, including long-term recruitment of old growth ecological features.

They are to be applied on a site-by-site basis, considering this project's fire hazard reduction objective, which will ultimately be guided by objectives for maintaining soil stability and water quality, as well as LSR values.

These recommendations are based on current understanding, and professionally acknowledged lack of understanding, of those species and habitat relationships identified as likely to occur in the Ashland Watershed, as well as those that are confirmed to be there. Although the immediate focus is in the context of a fire hazard reduction project, the recommendations are also intended to be consistent with the landscape-scale, long-term conservation plans that are being developed for species of concern, such as neotropical migratory (ntmb) and resident songbirds, bats, marten, and others.

NOTE: A detailed account of species to be affected by each recommendation, as well as more detailed literature citations for each recommendation, were not possible within the limited time frame available for this paper.

1. Cut few-no trees > 17" diameter at breast height (dbh).

Identifying a diameter limit to define, and restrict the cutting of, "big" trees is perhaps the most controversial issue within the AWPP, and a key catalyst for the formation of the AWSA. The 17" dbh limit has a wildlife-related biological basis according to the following: "Although there is a variety of opinions as to what tree size begins to function as late successional habitat (11-20" dbh), the *Mt. Ashland Late-Successional Reserve Assessment* determined mid-successional forest stands, 17" dbh and greater, were beginning to function as habitat for late-successional associated species within the Mt. Ashland LSR" (AWPP DEIS p. II-28).

Following are examples of wildlife use of trees, and of defects common to trees, with a 17" or larger dbh. Trees such as those described are present in the watershed. Species mentioned are known or likely to occur there:

Large, old growth Douglas firs are ideal habitat for specialized vertebrates, such as the red tree vole, northern spotted owl, and northern flying squirrel. Douglas firs infected with dwarf mistletoe can benefit wildlife directly by providing food, forage sites, cover, and nesting sites, and indirectly by causing openings and changes in stand structure by killing trees. Dwarf mistletoe can spread to a point where it adversely affects wildlife habitat by limiting tree growth, and killing too many trees. Dwarf mistletoe-infected trees reserved for wildlife can be grouped and surrounded by a treeless or non-host tree buffer.

Large diameter hollow trees are known to be used by pileated woodpeckers, northern flickers, Vaux's swifts, American martens, flying squirrels, black bears, bushy-tailed woodrats, and other small mammals as dens, roosts, nests, forage sites, and shelters. Within the Ashland watershed, grand fir is the species that most commonly forms hollow interiors.

Living trees with large dead tops or branches within the live forest canopy provide a distinctive habitat that is commonly used by woodpeckers, including the white-headed woodpecker. Surveys have not been conducted to determine if and where white-headed woodpeckers are nesting in the watershed.

Large, live or dead trees with cracks, crevices, cavities, and sloughing bark are frequently used by bats for roosting. Such trees are used by bats within the Ashland Watershed.

2) Retain coarse woody material (cwm; snags and logs) in accordance with the Mt. Ashland Watershed LSR Assessment (Table 1 and Appendix B) direction for size, density, and distribution.
Snags are an essential component in forests, and many wildlife species depend upon them for survival. Snag height, species, dbh, decay class and cause, structure, amount of current use, slope position, and distribution across the landscape all affect which species will use them, and how effectively. No snag inventory has been conducted within the watershed, and thus these snag characteristics have not been mapped or otherwise quantified. There is agreement, however, that on a landscape level across the watershed, there are numerous existing and incipient snags of varying characteristics as described above.

There is abundant information about the importance and roles of large logs on the forest floor, and how, according to characteristics much like those of snags, they contribute much-needed diversity to terrestrial and aquatic habitats in western forests. Because of their value as denning sites and shelter, hollow logs of any species and size class are particularly important wildlife habitat structural components.

The LSR Assessment, Table 1, quantifies *desired* cwm density for forest community types within the watershed. Appendix B describes *minimum* cwm amounts recommended for areas of strategic fire hazard reduction importance. In those areas, retain cwm at or above minimums. In other areas, based on long-term, wildlife habitat enhancement objectives, retain cwm as described in Table 1.

3) Where possible, orient large downed logs along slope contours.
The upslope sides of logs fill with debris into which small vertebrates tunnel. The downslope side provides effective cover for larger vertebrates.

Favor larger logs, as they provide more cover and over longer time periods, than do smaller logs.

4) Retain existing old-growth patches.
"In some instances, (groups of) mature and old growth trees in isolated patches had been marked for removal. These legacy individuals would be the hardest late-successional components to replace. The (USF&W) Service recommends a heavier thinning of younger trees around these patches in an effort to retain critical old-growth components even though fire hazard would not be fully removed." (USF&WS May 16, 1997 letter to Linda Duffy in AWPP DEIS Appendix B). This applies to, if not favors, Ponderosa pine.

5) Retain all snags as close as possible to edges of shaded fuel breaks. Consider retaining snags and coarse woody material within fuel breaks.

"The (USF&W) Service believes that coarse wood has an important habitat value in the fire breaks and should be retained at greater than recommended amounts where it does not interfere with the objectives of the hazard reduction project." (USF&WS May 16, 1997 letter to Linda Duffy in AWPP DEIS Appendix B).

Consider, on a site-by-site basis, removing more fuels in flank areas to allow for retention of snags and large downed woody material within fuel breaks adjacent to those flank areas.

Ridgetop snags extending above the canopy serve as "beacons" for bats to use as roosts.

Douglas fir (first) and Ponderosa pine (second) are the least hazardous standing dead trees or standing live-defective trees, from a *logging* safety standpoint, that can be left for wildlife habitat. Dead trees with a dbh of 12 inches or less tend to be more hazardous than larger trees.

6) As fire hazard conditions permit, minimize fire hazard reduction activities during spring breeding season.
Impacts on wildlife, including those species with federal, regional, state and forest-wide listing, from activities during the breeding season include: human interference with breeding behaviors; displacement of breeding pairs; crushing of nests, dens, burrows &/or young; burning of nests, dens, burrows &/or young; damaging individuals with smoke, and altering or destroying breeding, fledging and dispersal habitat.

7) Limit size of areas being impacted (i.e. units) to <40 acres and preferably 10-20 acres.
In order to minimize or eliminate fragmentation within the watershed, delineate units on a site-by-site basis in the smallest dimensions practicable.

8) Schedule activities over time and space to insure that contiguous units are not impacted within a given year.
This, like # 7 above, is intended to limit fragmentation and is also intended to provide wildlife with areas for escape and cover during fire hazard reduction activities.

9) Protect (buffer) unique features such as rock outcrops/cliffs, talus, caves, and open water sites.
Species of concern known or likely to occur within the Ashland watershed that are associated or dependent upon these features include: Townsend's big-eared bat, Califiornia myotis, fringed myotis, Northwest pond turtle.

10) Develop additional open water sites for bats
Reeder Reservoir and scattered pump chances within the watershed currently provide feeding and drinking sites for bats. Additional sites above the reservoir would enhance bat habitat and fire protection resources.

MONITORING

Criteria for selection of species and guilds to monitor:

As stated in the Watershed Monitoring Program section elsewhere in this document, the AWSA seeks to have the monitoring within this project be more than simply data collection, and for more than those species and attributes whose monitoring is mandated by law. This ecosystem monitoring approach will, by definition, guide the project towards the monitoring of numerous and interrelated wildlife habitat features. At the very least, and in order for this project to be as truly adaptive in its management as the AWSA intends, the monitoring program should be developed and fully funded before fire hazard reduction treatment begins.

It is understood that baseline data that will have been gathered for "Survey and Manage" species before treatment begins. Additional wildlife species or guilds to be monitored will be identified as the habitat viability indicators and measurables are defined within the watershed ecosystem monitoring plan.

Regardless of species, the monitoring must allow for adaptive management as 1) our own observations reveal the effects of our activities on wildlife and/or 2) other's ongoing research provides information that we would apply to our activities.

A partial list of potential free or low-cost cooperation & training resources for wildlife monitoring:

- Partners in Flight, Western Working Group and OR/WA Chapter: ntmb and resident songbird conservation plans, monitoring guidelines and protocols, training sessions

- Cornell Laboratory of Ornithology: citizen's bird monitoring programs, training materials, off-site consultation

- University of Idaho: White-headed Woodpecker Project monitoring protocol, training, support

- Wallowa Valley Zone, Wallowa-Whitman National Forest: Snag monitoring protocol

- National Audubon Society, local chapters: volunteers

- REALCorps: volunteers

- Wilderness Charter School: volunteers

- Southern Oregon University Department of Biology: consultation, field expertise, volunteers

- Pacific Northwest Research Station, Research Natural Area Program: consultation

- World Wildlife Fund, Ashland office: consultation

Potential funding & funding information sources:

- Simbiota c/o University of Wisconsin Department of Wildlife Ecology: grantwriting guide; funding directory for ntmb research/monitoring; free review of draft proposals

- National Fish & Wildlife Foundation, Neotropical Migratory Bird Program

- Bat Conservation International

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SOIL CONDITIONS WITHIN THE ASHLAND CREEK WATERSHED

(written by Richard Hart)

ASHLAND WATERSHED AND GRANITIC SOILS

Erosion and sedimentation processes on the Ashland watershed's decomposed granitic soils (DG) and DG soils in general are dynamic. The extent and behavior of these soils, as well as management and biological effects continue to be viewed as a very intractable problem. While DG may appear normal on the surface (and even manifesting good-looking ecosystems), yet once the surface is disturbed, the sandy material begins its downhill migration with accompanying high debris-flow susceptibility out of the headwalls and swales. After wetting up, weathered granitic soil is permeable and, during intense rainfall, can become saturated with water. When the pore pressure exerted by the water exceeds the strength and weight of the soil, the weathered mass instantaneously becomes fluid and a debris flow occurs. The watershed's fire and storm histories attest to these processes, as recently Dec. 31, 1996.

Surface erosion on DG can and does take place without mass wasting. Exposed surface soils, caused by fire or management activities, are susceptible to raindrop impact, overland flow, rilling, and dry ravel (Megahan 1992). Slow vegetation recovery on south- and southwest-facing slopes can be attributed to a combination of shallow, coarse-textured DG with low moisture holding capacity during hot, dry summers. Furthermore, summertime erosion rates are attributed to greater rainfall kinetic energy associated with high intensity late summer convective storms on dry water-repellent DG. Research shows that the percentage of bare soil and bare soil opening size is attributed to the non-cohesive nature of DG (Megahan and Molter, 1975; Megahan, 1989; Bethlahmy, 1967. Road cuts and side casts "grow" spatially over time. The interception and redirection of surface and subsurface flows further aggravates DG soil erosion (Megahan and Kidd, 1972)

Work by Megahan and Bohn (1989) has shown that sapping types of mass failures may also be accelerated by vegetation removal on coarse-textured granitic soils. Such failures can occur on much gentler slopes as the result of seepage forces exerted by soil water movement and tend to be progressive over a period of years. Slope gradients at sapping failure sites averaged 25 percent, considerably lower than slope gradients at debris avalanche sites. Failures were all located in swale areas and were all associated with increased ground water levels resulting from timber removal by logging. The failures in the Ashland watershed during the 1997 Storm attest to this. Bethahmy (1967) showed that logging on DG on south slopes is more likely to cause accelerated erosion on south slopes than on north slopes. Megahan (1989) found increased erosion rates 10 years after logging on south slopes subjected to post-logging prescribed burning.

The 1964 flood delivered approximately 60,000 cu. yds. of DG sediment to Reeder Reservoir (Montgomery, 1977). The 1974 flood contributed 130,000 cu. yds. to the reservoir (Wilson and Hicks, 1975). The 1997 flood sent 67,000 cu. yds. to the reservoir (Jim Olsen, assistant engineer, Ashland City). "…Landslides delivered sediment to the reservoir at a rate of 3.31 cu.yds./acre of land, and the rate for surface and channel erosion was 7.14 cu.yds./acre. Averaged over the 10 year period from 1965-1975,

*Note: "Detection monitoring" is a scientific tool used to detect changes; to establish a baseline to determine if, when, and where changes are occurring; and to quantify those changes. It is also used to determine the need for and design of evaluation monitoring where unexplained changes have been detected.

Landslides produced sediment at a rate of 0.33 cu. yds./acre/year, and surface and channel erosion at a rate of 0.71 cu. yds./acre/year" (de la Fuente and Haessig, 1992). In the same paper, roads within the Ashland Watershed produced 525 times the volume of sediment over the undisturbed portion. All disturbance classes produced 8 times the volume. (Review chart below.)

Note: chart not in electronic version!!

Chart from *Landslide and Surface Erosion Rates In The English Peak Batholith and Ashland Pluton, Central Klamath Mtns. CA and OR.* Proceedings from the Decomposed Granitic Soils Conference. Sari Sommarstrom, ed.
Redding, CA. Univ. of CA, Davis. 1992

Obviously, effective groundcover is critical for soil retention in the Ashland watershed.

FIELD-BASED OBSERVATIONS

Considering the above information, my personal monitoring and observations[1], and the pending Watershed Protection Project that includes tree removal for "shaded fuel breaks" and thinning on the ridge flanks. The following are observations and considerations:

- All soil loss that I observed and measured comes from areas having inadequate ground cover. Effective ground cover, and the lack thereof, is an important factor contributing to erosion rates.

- There are three types of effective ground cover: grass; cryptogamic (lichens and moss) crust; and "thatched" duff. Litter fall is not an effective ground cover by itself, especially on DG soils.

- The duff layer is the most important component of ground cover on undisturbed forested DG soils.

- Even when ground cover is retained through "cool" burns, the critical duff component is often charred or destroyed.

- Following broadcast burning, charred duff and litter is often lost through rapid oxidation, surface runoff, or wind erosion, thereby, reducing the level of effective ground cover. Soil loss begins once the protective forest floor layer is lost.

- During Spring burns, a percentage of the moist duff layer may stay but it may have its life forms extirpated by steaming, as fatal temperatures for most living organisms occur below 100 degrees C (L.F. Debano et al.1998).

- The hydrophobic nature of DG soils exacerbates surface erosion. Research shows that summer and fall rains on dry hydrophobic DG is one of the main reasons for high erosion rates. Once these soils wet-up, they are far less water repellent.

While I quantitatively detected upper-slope or near-ridge surface soil loss, I did not survey for soil accumulation down the slopes. My sense is, given the uniform slope inclination; ground cover or the riparian and aquatic zones intercept the material. The area and percentage of direct contribution to the stream courses needs to be identified and determined, so that effective restoration projects can be designed and implemented to stem the accelerated erosion. Well-placed fabric dams would yield valuable information. Fabric

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[1] Draft Report of June 9, 1998. *Results of Detection Monitoring Soil Conditions Within The Ashland Creek Watershed* by Richard Hart

dams are a great monitoring tool, cost effective, and make great impressions on decision-makers.

SOILS RECOMMENDATIONS

The accelerated soil surface erosion affects two key resources within the Ashland Watershed, soil and water. The quality of both these resources has be recognized and protected by Congressional Acts, State Regulations, and Forest Service Standards and Guidelines. NEPA requires a "hard look" by the Forest Service using an appropriate methodology.

- The three effective ground covers need to be protected, enhanced or restored where appropriate.

- Project activity within the Ashland Watershed needs to be designed to address and accommodate landscape conditions and not at minimizing impacts that a project imposes upon them.

- Most every past serious look in the Watershed by a soils or watershed specialist has led to a set of recommendations to quantitatively monitor sediment initiation and delivery.

- Each soil-related Ashland Watershed management plan needs to include an in-depth alternatives assessment, which includes establishing and correlating erosion rates for the various DG soil subtypes and exposures; with varying slope and ground cover conditions within the disturbed areas of the watershed.

- A "Zero-Net Increase" sediment formula needs to be jointly developed by federal, state and city agencies for this municipal watershed.

- The Watershed seriously needs a Fire Management Plan. Without it the fuel reduction and broadcast burning activities are piecemeal and subjective. It doesn't mean that small projects cannot be planned and implement under a Fire Management Plan.

- Immediately design, fund, and implement a holistic monitoring plan that includes community participation. We seriously need a structure that solves our watershed problems by a process of diagnosis and local repair. It is the only way to insure the long-term ecosystem health of and social order within our watershed.

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ESTABLISHING A WATERSHED MONITORING PROGRAM

(written by Richard Hart)

Monitoring could be defined as simply obtaining accurate information and maintaining a long term record of it. The monitoring of our watershed entails a purposeful and systematic observation and documentation of its landscape, its inhabitants, its perturbations over recent times, and what management has worked and not worked. Without monitoring we are simply making decisions and implementing treatments based on oversimplifications, such as "fuels reduction." Our watershed has not been monitored well, and this is a great loss because its history would be very informative.

Our watershed and its surroundings have been recognized by the World Wildlife Fund, and many scientists, as a special place on this planet for its biological distinctiveness. The *Global 2000 Project*, a representation approach to conserving the Earth's most biologically valuable ecoregions, places the Klamath-Siskiyou coniferous forests as a unique area worth study and protection. As such, we are a stake-holder in a global conservation strategy. It is our responsibility to better recognize and mitigate the effects of our projects that result in fragmentation and loss of species diversity and dispersal.

Since the June 1992 Earth Summit, in Rio de Janeiro, followed by the Montreal Process and the Santiago Declaration, a list of Criteria and Indicators has been used to characterize the conservation and sustainable management of temperate and boreal forests. They relate specifically to forest conditions, attributes, or functions, and to the values or benefits associated with environmental and socioeconomic goods and services that forests provide. The United States is a signature member of the Process and Declaration and the Forest Service has been instrumental in developing specific monitoring programs to address the seven Criteria and Indicators[2].

The Ashland Watershed Stewardship Alliance endorses the Montreal Process and the Valdez Principles as the platform by which we address the Watershed concerns and treatments. We ask that the monitoring methods developed by the National Forest Service by implemented in our Watershed projects. We also support the Rogue River National Forest's *Ecosystem Monitoring Handbook*[3] be utilized, as well as credible methods employed by the Ashland Watershed Stewardship Alliance.

We ask that a monitoring program be developed and fully funded before treatment begins in our watershed.

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[2] A copy of the Criteria and Indicators is attached as an addendum. Sorry for the mark up.
[3] A framework, developed from the RRNF Handbook, is included as an addendum.

RESEARCH AND DEMONSTRATION STEWARDSHIP UNITS

(written by Jeff Fields)

As the relationship between the USFS and the AWSA develops, the Alliance may seek the responsibility and authority to manage a certain relatively small amount of the project area to accomplish agreed upon future conditions for those areas. These units would serve as research and demonstration areas for a wide range of technical treatments, the social networks needed to accomplish them, and perhaps, one or more local processing ventures that would add value to the harvested material. Any revenues generated by this processing would be used to offset the costs associated with creating the desired future condition on the land.

The units already demarcated in this entire project area can be divided into three broad categories.

Category A includes the units previously designated as commercial by the USFS. Category B includes the units that, based on their topography, volume, and access have some potential for generating a net positive return, but in value that has not been recognized to date because of assumptions about the type of yarding equipment that would be used, the manufacturing processes applied to the material, or marketing of the final product. Category C includes all the non-commercial units that, because of limitations imposed by topography, volume, and access, would remain outside the reach of currently known technology or markets.

Category A is a revenue source for the FS to apply to this project. Most of these units could be treated through the traditional timber sale process, though a small number of acres could be included in the stewardship contract to offset the costs of treating any contracted category C units.

Category B is currently a cost for the FS. For the units in this category that are taken up by the Alliance through a Stewardship contract, the cost of bringing these units to the desired future condition could be lower than currently projected. Most of the units covered by a stewardship contract between the USFS and the Alliance would be drawn from this category.

Category C is currently a cost for the FS. The Alliance may take on a small number of acres from this category, but in most cases we would hope to leverage appropriated FS funds (because of the high level of community collaboration in this project area) to cover the cost of their being treated by contracted crews.

The intent would be to select a range of units that can be treated via a Stewardship contract, with most of them having the potential for some revenue generation, even if total treatment costs exceed revenues. Under this scenario, an additional benefit can be the collection of data on thresholds of profitability and loss that will help define the "state of the art" in treating these historically non-commercial stands.

A STRATEGY FOR ENGAGING ADJACENT PRIVATE LANDOWNERS

(written by Jeff Fields)

When discussing how to minimize the risk of large-scale, high intensity wildfire in the Ashland watershed it is important to acknowledge and address the condition of lands adjacent to the National Forest. Private landowners who own forested parcels adjacent to National Forest lands have a critical role to play in ensuring the fire resiliency of their own properties, and in minimizing the opportunities for high intensity wildfire to cross ownership boundaries.

The AWSA proposes a strategy for engaging these private landowners that includes:

Using the contacts and experience of Alliance members (Marco Bey, Marty Main, Bill Robertson, and others) with the logistical support of the Rogue Institute's community forester to focus outreach on private property owners with forested interface lands.

Leveraging private landowner interest in performing work on their own land by drawing on a network of community-based practitioners (REAL Corps, Lomakatsi, and Rogue Institute's community forester and EWTP Crew) to assist individuals or neighborhood work parties in the planning and supervision of the hazard reduction work. It is also possible that in some cases local volunteer youth crews (from the Charter School and others) can be organized to assist with the labor.

Firewood generated through this work will be donated to the Jackson County Fuels Committee for distribution to needy families. Revenues from other merchantable products would first go to reimbursing the Alliance members for planning work, with any additional going to the landowner.

Administrative costs associated with this strategy could be covered by funds raised by the Alliance, or potentially Federal funds accessed under the authority of the Wyden Amendment.

SEQUENTIAL SCHEDULING OF DECISION PROCESSES

(written by Richard Brock)

The AWPP proposal outlines several types of treatments designed to be implemented over a period of several years. Some of these proposed treatments are inter-related, such as work in stands that have large trees that may be cut; other proposed treatments such as underburns and manual treatments are more or less "modular". There is no real need to approve and implement all parts of the planned actions at the same point in time. We propose that, where possible, elements of the proposal be analyzed and approved separately to allow for focused discussion of specific issues and to allow for non-controversial treatments to proceed as soon as practical. A useful decision sequence would be to first design, approve and begin implementation on the manual treatments in areas that are in the proposal as "non-commercial" (e.g. the letter units). Secondly, a decision can be made as to how best to proceed with an adaptive management strategy for a combined manual pre-treatment / underburn methodology. Third a decision can be made as to how best to implement a combined "commercial" cut and understory treatment in the proposed "flank" and ridge areas. Finally, a long term proccess can be designed to address the needs of the larger landscape.

Decision Phase 1; Manual Treatments: Approve and proceed with manual treatment (thinning and pile-burning of trees and shrubs under 8" DBH on units identified by the Forest Service in Option 5. There appears to be consensus that this type of treatment is appropriate in the watershed. There may be differing opinions as to where this work should be prioritized but there is agreement that it should get started. There is currently funding available within the Forest Service to proceed with some of this work, and funding may be forthcoming from other sources as well. Implementation of this phase will be ongoing for the next 5 to 10 years.

Decision Phase 2; Combined Manual Treatment/Underburning: Design and approve a methodology for achieving ecosystem restoration and fuel reduction goals through a combined manual treatment/underburn approach on those units currently proposed for underburning (e.g. the letter units). There appears to be consensus that it is extremely difficult to achieve the stated objectives with underburning alone and further that there are serious resource risks which accompany underburning. A design which incorporates some level of pre-treatment on underburn units to allow for more predictable prescribed fire effects should be developed through an adaptive management process. Implementation of this phase will be ongoing for the next 5 to 10 years.

Decision Phase 3; Proposed Flank/RidgeTreatments: Utilizing the framework proposed by the AWSA, modify the treatment strategy within the proposed flank and fuelbreak treatment areas to reflect the complex stand structures and plant communities which exist on these sites. This part of the project will involve removal of some number of large trees.

This has proven to be the most controversial part of the project and great progress has been made in resolving the issues involved. Implementation of this phase will be over a 2-3 year period.

Decision Phase 4; Landscape Level Management: A comprehensive long term plan is needed to maintain the watershed and LSR values in the watershed. This may involve continued understory-thinning including light thinning in geologically sensitive areas; it may include development of a treatment proposal in the Ashland Research Natural Area. Based on lessons learned through phases 1 through 3, a long term plan can be more intelligently developed. Implementation of this phase will be over a 20 year period.

APPENDIX A -- ORGANON OUTPUTS

This Appendix not included in electronic version

A Review of the DEIS Economic Analysis

Ashland Watershed Stewardship Alliance

The people of Ashland, as demonstrated by the strong and diverse support of the Ashland Watershed Stewardship Alliance, are looking to build a new, partnering relationship with the USDA Forest Service specifically the Ashland Ranger District, on matters relating to the active management of the publicly owned lands of the Ashland watershed.

We look to build a productive and continuing working relationship, which will help to build citizen awareness, respect, understanding, involvement and responsibility for the welfare of this forest, a relationship that we know will be mutually beneficial and rewarding for both the agency its staff and the citizens of this community.

As the community develops it's response to the Draft Environmental Impact Statement released in September of 1999, it has recognized, specifically in regard to the Economic Analysis component of the Statement, that the data necessary for a valid comparison of the proposed alternatives is in some cases lacking, and in some cases has been formatted incorrectly and thus presents an inaccurate portrait of the true costs of this project.

In order to more accurately compare the costs and benefits of the various alternatives, and to build the economic assessment of the Alliance's proposal, we have outlined, with the direction of two retired USDA economists, a review of the Economic Analysis of the DEIS and point specifically to issues which we feel need to be clarified or in some cases, refined. We hope that, in partnership with the Forest Service, and with the proper tools and data for comparative analysis, informed decisions can be made as to which prescription is most appropriate in order to mitigate the risk of catastrophic fire, while meeting the long term management values and needs of the Forest Service, the City of Ashland, and the community, maintaining intact and viable forest ecosystems in the watershed.

General Review

As stated in the DEIS, Chapter I, the purpose of the DEIS (and thereby the economic and financial analyses), is, in part, to disclose possible consequences of implementing a proposed action and alternatives. Also, it is to provide analysis sufficient to make a federal decision whether to implement the project, as proposed, or one or another of the alternatives presented in the DEIS, or a new alternative derived from those alternatives (p I-20).

In DEIS, Chapter 1, Scoping of Issues, it states that the economic feasibility associated with the design features of each alternative considered is of concern (p. I-28). It states overall assessment of economic feasibility includes an assessment of both the financial cost, and the intangible value of resources retained versus lost to high severity wildfire of each alternative. Analysis indicators are given, presumably for the purpose of measuring economic feasibility, as follows: Total treatment cost, Cost-plus-loss value (including net value change and treatment cost for fire hazard reduction), and net cash value, each by alternative. The reasoning or rationale as to why Issue #5 was analyzed using these analysis indicators and this particular economic formulation (economic feasibility assessment) was not stated.

The Forest Service chose a "Cost-plus-loss" methodology employing the economic analysis model, "Decision Analysis" to address the first part of the assessment, financial cost for each alternative. No analysis indicators, methodology or analysis results were presented to address the second portion of the assessment, "Intangible value of resources retained versus lost."

Economic analysis results are presented in Chapter II, Alternatives, Including the Proposed Action, and Chapter IV, Section 5, Impacts Associated with Economic Feasibility of Implementing Fire Hazard Reduction Treatments (p IV-41 to 44), and Appendix F: Economics. A second Appendices including a "Value at Risk" Report and "Economics" section was circulated. The connection between this second Appendix and the DEIS is unclear. Although it is not readily apparent, it appears the Values at Risk Report (undated) in this Second Appendices may be the 1985 Values at Risk report referred to in the DEIS, Chapter III, page 32, and Chapter V, References. The "Economics" section of the second Appendices did not appear to be cited in the DEIS. It appears to be raw input data for yarding costs, presented without explanation.

Before providing detailed comments, several observations are needed regarding several difficulties encountered in the overall review of Economic sections of the DEIS. Review of this material was difficult because of the generally confusing, inconsistent, and partial documentation of economic information, data and analysis results in the DEIS, particularly in Chapters I and IV. As a result, a thorough and complete review of the overall accuracy, reliability or interpretation of results of the economic feasibility analysis and how it relates to the Issue #5 was not possible.

These difficulties in reviewing the economic feasibility assessment are of particular concern and troublesome given the desire and need of the community to interact closely with the Forest Service in developing a community alternative which is workable in terms of it's financial and budgetary considerations. Per District Ranger's 1950 NEPA letter dated August 20, 1999, the community alternative should provide a feasible alternative proposal that is ecologically sound, with practical methods of application, and realistic financing. Although further discussion is needed with the Forest Service regarding the meaning and intent of these terms, we understand the last requirement to intend that all alternatives, including the community's preferred alternative, to be financially realistic, that is, to be financially efficient and within reasonable financing capabilities. Also, the letter states that development of a new funding structure, presumably involving both the community and the Forest Service, would be needed for this kind of stewardship activities. Again, further discussion is needed on this topic, but addressing a new funding structure could have ramifications for how the financial portion of the assessment is conducted.

Without a clear presentation in the DEIS of the Forest Service's economic and financial analysis, including the rationale for how it is formulated relative to Issue #5, it will be difficult to meet these expectations of the District Ranger. Furthermore, given the potential involvement of the community in developing financing for this project, it would be useful to clarify these requirements during the NEPA process, prior to development of the final preferred alternative.

The following are several examples of the difficulties encountered in reviewing the economics section..

1. Terminology was not defined adequately and different terms referring to the same data appear in separate sections of the DEIS, These terms include: total treatment cost, fuel treatment cost, expected fuel cost, expected fire costs, treatment cost, fire suppression cost, rehabilitation cost, financial cost, logging cost, net cash value, net cash flow, net positive cash flow after logging costs, resource value change, net resource value and net value change. Some of these terms could be understood by the context of their usage, but others were not defined in any way. The following costs were mentioned in the document, but then were not referred to in the analysis results: fire suppression cost, rehabilitation cost, financial cost, expected fuel cost, annual budgeted pre-suppression cost, expected annual emergency suppression cost..

2. Economic analysis results presented in Tables IV-10 and IV-11 did not agree or seem to make sense when cross-checked with data available from those Tables. Therefore, the methodology used in the economic feasibility assessment is questionable.

a. DEIS, p. I-29.
Cost-plus-loss value = net value change + fire suppression cost + treatment cost + net cash value. Inserting data from Tables IV-10 and 11, we get the following:
$164,125 = 35,781 + "fire suppression cost" (not given, but would be a "negative" cost, given this formulation) + treatment cost (It is unclear whether this treatment cost refers to 155, per Appendices F or 240,095 as derived in d. below) + 438,310.
What is the meaning of this "negative" treatment cost?

b. DEIS, p I-29.
Net cash value = "treatment cost" + net cash flow.
Inserting data from Tables IV-11, gives the following:
$438,310 = - 240,095 (a "negative" cost; derived by subtraction) + 678,405.
Again, what is the meaning of this "negative" treatment cost?

c. Appendices F, Economics.
Cost-plus-loss = expected fuel costs + net value change + treatment costs.
As shown in Appendices F: $164,125 = 128,189 + 35,781 + 155
(Why is a per acre treatment cost added to total acreage costs for expected fuel costs and net value change?).

d. Derivation of fuel treatment cost-used in a. above.
Total treatment costs = "fuel treatment cost" + logging cost.
Substituting with DEIS data: $1,314,665 = 240,095 (derived by subtraction) + 1,074,570 (assuming logging cost equal timber revenues (1,752,975) minus net positive cash flow (678,405))
Given the information provided in the DEIS or Appendices, it is not possible to resolve these inconsistencies, determine accurate data from erroneous data, or generally, understand just exactly what is going on with this cost-plus-loss analysis.

3. The economic section, REPORT "VALUES AT RISK" (undated), in the Second Appendices (apparently the 1985 Values at Risk Report referenced in the DEIS) demonstrated such serious shortcomings, including outdated data, missing citations, questionable sources, as to be of little, if any, usefulness or reliability in support of relevant sections of the DEIS, Chapter III. Affected Environment, or Chapter IV. Environmental Consequences. See detailed comments below. Assuming this undated "Values at Risk Report" is the same report as the 1985 Values at Risk Report cited in Chapter V, References, use of this kind of "economic analysis and information" in the DEIS brings into question the veracity and reliability of the entire Economic Assessment of Issue #5, in particular, and the reliability of the DEIS , in general. .

Specific Points to be Addressed

Chapter 1-Purpose and Need for the Proposed Action
Page I-28

The description of Issue #5, "Economic Feasibility" refers to the "intangible value of resources retained versus lost". What are these "intangible values" and "resources", specifically as they relate to Chapter IV, Environmental Consequences?

It appears the "assessment of financial cost associated with the implementation of each alternative" refer to the Expected Cost-plus-Loss Analysis. Is this correct? If so, should the assessment not be titled "assessment of economic and financial cost associated…?" since it appears the data included as Resource Value Change is economic, rather than financial (See below)? Please clarify.

Page I-29
Analysis Indicators for Issue #5

Are the economic parameters "Total treatment cost, by alternative" and "net cash value" independent of, and separate from, the Cost-Plus-Loss value parameter? If not, what is the relationship between "Total treatment cost (the first parameter), and treatment cost (included in the 3^{rd} parameter)?

What is the definition of "net resource change" and how is this indicator measured? What is it "net" of? Is it the same as the term "Resource Value Change" as used elsewhere in the economics section of the DEIS?

Page I-31

Recreation Use

Was Recreation Use included in the Net Resource Value Change portion of the Overall Expected Cost-Plus- Loss Analysis in Chapter IV, Table IV-11? If not, was it considered in some other fashion in Chapter IV, Environmental Consequences?

Page I-32

Indirect Local Economies

Given the importance of the project area to local economies (see Socio-Economic Setting, page III-30), were the impacts from any of the alternatives considered to be significant with respect to employment or income? Were the potential impacts on local non-timber or non-recreational forest users considered? If so, how were they considered, and were any of the potential impacts considered significant?
Were the economic aspects of Scenic Quality, Roadless Character, ….. or elsewhere?

Chapter III Affected Environment
Page III-32
Tourism

Reference is made to the 1985 Forest Service Report "Values at Risk", regarding $53.2 million is derived annually from tourism in the City of Ashland. What does the $53.2 million figure refer to, Gross Sales, Income Generated or other statistics? Are there estimates of these values **that** are more current that 1985? What would these current values be estimated for 1998 or thereabouts? Can some estimate be calculated for the potential impact of Changes in the Project Area on local economies regarding timber, recreation/tourism, non-timber products, etc. in the local area?

Chapter IV Environmental Consequences
Page IV-42

Fire Suppression costs are referred to on page IV-42 (third paragraph) as not including in rehabilitation costs. Where and how are these rehabilitation costs included or considered in this economic analysis?

The economic spreadsheet referred to in the 6th paragraph states that the "model…arrives at a present net value (PNV) or net positive cash flow.". How were the various project costs and revenues included such that they could be discounted to present value terms? What time period(s) and discount rate(s) were used in the PNV analysis?

Page IV-43
Tables IV-9 and IV-10

Do these cost estimates appear to be reasonable for the project area?

Table IV-10
Timber Value

How was the 3339mbf from Table IV-10 calculated? Was it based on cruise data, or by other means? How was the timber revenue per MBF ($525) calculated? At what point in the production process (leaving the sale area, arriving at the mill….) is this value assessed for? Are these costs which the Forest Service will incur, or the contractors designated to perform the work? From what data (historical, projected, local, forest –wide, regional, etc.) was this value derived from?

Table IV-11
Total Treatment Costs

The derivation of total treatment Costs (fuel treatment+logging) are not shown. How were each of these figures determined, and please identify and show the source of the data being used?

<u>Net Cash Value</u>

Is the net cash value for Alternative 5 (+$438,310) the sum of the Treatment Costs, plus the Net Positive Cash Flow (after logging costs) or Net Cash Flow (per definin9tion on Page I-29? If so the Net Cash Value (438,310) minus Net Positive Cash Flow (678,405) equals Treatment Costs (-$240,095). As mentioned above, what is the meaning of this "negative" treatment cost? Is this negative cost figure the result of an erroneous formulation of the economic analysis? Please explain What is the relationship between this treatment cost ($240,095) and the Total Treatment Cost ($1,314,665) per Table IV-11?

What is the relationship between this “treatment” cost and the “Total Treatment Cost”, per Table IV-11?

Total Treatment Cost	1,314,665
-Fuel Treatment Cost	-240,095
Logging Costs	1,074,570

then what specific cost items are included in these Logging Costs?

Resource Value Change

How was Resource Value Change for Alternatives 5 ($35,781) calculated? What specific Resource Value data was included in this figure? Was this on-site data inputted to NFMAS, or off-site data provided within the NFMAS data base? If off-site, from what sources was the data collected?? What specific resources and resource values were used and included in the calculations? Were they specific to the project area or based on off-site data from the National Fire Management Analysis Systems (NFMAS) referred to on page IV-42? Was all cost data used in the economic analysis gathered on-site, or was off-site cost data used? If off-site data was used, which costs items were off-site? Please explain on what basis the off-site data was determined to be accurate with respect to the Ashland Watershed Protection project area? Was the cost data used in this economic analysis based on “planned” costs, or cost data based on actual experienced costs for each respect management activity?

Appendix F: Economics

:Are these expected fire costs the “same” costs of fire suppression referenced on page IV-42?

The Footnote on the last page of Appendix F: economics (alternative 5) indicates that the Treatment Costs is the post sale treatment cost ($593) minus the Net positive Cash Flow (on a per acre basis, $438). Why are the Net Positive Cash Flow figure(s) included as a per acre figure? The two parameters (expected fire cost $ Net value Change) to which this per acre net positive cash flow figure is added are total area figures, not per acre. Also, it appears that the post-sale treatment cost ($593) is a per acre figure; is this correct? If so, why was it also added to the total area figures?

Second Appendices: REPORT “VALUES AT RISK”
This Report states that “the objective of the fire management analysis and planning is to identify the efficient fire management program and budget that meets land and resource management objectives for a planning unit; (and) to identify for potential constrained budget levels below the efficient one the program mix that would be most effective (p.2, Introduction).” If this is the objective for the economic assessment presented in the DEIS, it is not clear from the assessment that the fire management programs and budgets identified are, in fact, efficient, or that the program mix(Report states that the Resource

Values at Risk Analysis that follows emphasizes item three: Expected annual wildfire net resource value change, requiring evaluation of cost plus net resource value change (C+NVC). It is assumed this refers to the Expected Outcome(Cost-plus-Loss) analysis conducted in the DEIS, using the Decision Analysis economic analysis model. If this is the case, then it appears the Values at Risk Report is to provide input to the Net Resource Value Change part of that analysis. Given the shortcomings of the Report, as shown below, we believe the Economic Feasibility Assessment, Cost-plus-Loss analysis, is in error, unsupported, and does not address the assessment needs of Issue #5.

a. Given the date of the Report (presumably 1985), the date (1977) for various data cited, and the wording included in various parts of the Report (p.2, Planning Requirements), it appears this analysis may have been conducted originally for the Rogue River Forest Planning process and substituted here for a site- specific analysis for the Ashland Watershed Protection Project. Is this the case? If not, was this Values at Risk Report conducted specifically for the Ashland Watershed Protection Project, as part of the preparation of this DEIS. If so, why were value (p.3,13,14), cost(p.5) and fisheries population (p.3) data, each more than 20 years old (1977), used in this analysis? It would appear the updating of dollar values referred to on p.14, was to adjust for inflation only, and does not reflect newer study data. Is this correct? See p.13, "The values displayed are 1977 values. Values are much higher at present." Such data must certainly be unreliable and not useable in the analysis of the Ashland Watershed Protection Project, nor in the NEPA process.

b. A grand total of $2,872,103 is shown (p.4), as the summation of each of the subsequent "sub-parts" of the Report. Yet this total does not include some figures, such as Dredging, $50,200 (p.6) and includes other figures cited incorrectly, Economic Impacts $1,245,000 (p.4) vice $1,232,000 (p.17). There are other inconsistencies, but this makes the point.

c. See DOWNSTREAM EFFECTS, Lithia Park, page 17. The COST DISPLAYED 2 section cites a "Lost retail" figure of $176,000, an "economic multiplier" of 7, and a "Total Economic Impact" of $1,232,000. The report does not specify the source or basis for the "Lost retail" figure. Also, it does not indicate the type of multiplier the "7" refers to, nor it's source or basis. Without such information, it is impossible to make sense of the Total Economic Impact figure. In any case, reliable multipliers are not "generally 7" or any other constant value. They change from situation to situation, and are used differently depending on the source of the figure being multiplied. Characterizing an economic impact analysis in such terms suggests the analysis is without basis or credibility. Also, if these equity-type economic impact data are included in the Cost-plus-Loss efficiency analysis ("net resource values"), as stated, there may be a basic error of methodology in adding "apples and oranges," that is, equity and efficiency data.
It appears the information in the various studies included in the Report are anecdotal and generally descriptive, with data based on gross estimates and opinion, rather than standard

economic analysis methods. Overall, it would appear that the data used in this analysis, and the manner in which it was conducted, was essentially arbitrary.

Conclusions

In conclusion, we believe there are serious limitations in the manner in which Issue #5 has been addressed, both descriptively and analytically. It appears there are numerous and significant errors within the analysis that need to be corrected. As mentioned above, we question the adequacy of the economic and financial analysis relying solely on the Decision Analysis model. We believe a complete review of the various economics sections in the DEIS and supporting Appendices is needed. In addition to correcting the assessment, the review should clearly explain and appropriately document all aspects of the economic assessment of Issue #5. It appears from the List of Preparers shown in Chapter VI, and the contributors listed in the Acknowledgment section, page 1, of the Second Appendices, Report "Values at Risk", that no one with specific economic analysis skills participated in the preparation of the DEIS. This economics review of the DEIS would tend to support such a finding. It is suggested that an additional person(s) with competent economic analysis skills be involved in the revisions of the DEIS and/or the preparation of the FEIS.

A part of the economic feasibility assessment, as describe in Chapter I, is the "Intangible value of resources retained versus lost to high severity wildfire". However, no analysis indicators were given for this part of the assessment, nor were any analysis results presented in Chapters II or IV. Although analysis of intangible features of the project is critically important, this material may be better presented in a stand alone section, rather that lumping it with the economic feasibility assessment. If these two sections remain in the economic feasibility assessment, the relationship between the intangible values and the economic/financial measures should be clearly defined.

Given the importance of developing a community supported alternative that will be practical and financially realistic, a more clearly defined and carefully focused economic and financial assessment is needed. We suggest the analysis framework of current economic assessment be reconsidered. Although an overall measure of economic efficiency such as a cost-plus-loss value may be useful for alternative-by-alternative comparison, more specific analyses will most likely be needed in developing a final preferred alternative that meets the economic, financial and budgetary needs of the community and Forest Service. We would suggest that the community be included as part of this effort.

The Ashland Watershed Stewardship Alliance recognizes the need and responsibility for continuing human stewardship within the watershed in perpetuity. The costs reflected in the DEIS are reported as one-time expense, and thus may greatly underestimate the lasting future monetary cost of the project and ongoing management costs.

We hope that, in parnership with the Forest Service, the questions raised regarding the economic portions of this DEIS can be clarified and formatted in a way that allows for accurate agency and public assessment of the various alternatives proposed to ensure an effective and timely beginning to the fire hazard mitigation efforts we all recognize as necessary.

Strategies for Community Outreach during the Comment Period

Ashland Watershed Stewardship Alliance

Our goal for outreach is to engage a full range of the community in vigorous, open dialogue on the care of the Ashland watershed and the immediate issue of fire hazard reduction. Our strategies will include:

*Press conference set at the time of delivery of AWSA packet to District Ranger Duffy

*Mailing of the AWSA comment and proposal summary to:
Forest Service DEIS mailing list (120)
Targeted residents of the interface
Civic and service clubs

*Web site set up with full document available

*Distribution of full document
City Council members and related administrators, Ashland Forest Commission, Watershed Enhancement Team, School of Science at SOU, Ashland Public Library Reference, Ashland Fire Chief, Senator Wyden and Smith's Office, and on request

*Development and distribution of a concise hand-out describing and comparing options

*Individual outreach
Door-to-door outreach following training w/Kevin Preister

*Presentations to groups and organizations
Already scheduled - BARC (Building Resilient Communities) and Ashland Realtors Multiple Listing Mtg.
Interface property owners - through neighborhood mtgs., targeted mailing, possible door-to-door outreach
Other targeted groups: civic groups, trade/business associations, churches

*Public Forum - early December

*Media - Op-ed piece, letters to the editor, radio talk show, cable access television

*Ashland City Council - Continue contact and dialogue

Paying for the project

Ashland Watershed Stewardship Alliance

The traditional way

Projects which restore fires resiliency to forest ecosystems depending upon fire, like the Ashland Watershed Protection Project, are very labor intensive and expensive. Funds, appropriated from Congress (ie. Wild Land Fire/Hazardous Fuels Funds), are used to cover much of the costs of this kind of work. Typically, this work is performed through a "timber sale" contract in which larger timber is removed in these projects in order to:

a) meet fire mitigation goals,
b) generate economic interest for contractors who would bid on this work, and
c) build accounts (Knutson-Vandenberg Funds and Brush Disposal Funds), which could cover some of these costs

Another way

In the Ashland Watershed, concerned citizens have expressed a desire not to cut the larger trees in order to generate funds for the fire mitigation work. The Ashland Watershed Stewardship Alliance would prefer to develop alternative means to not only cover the costs of this project, but to ensure that these costs are reduced as much as possible and that the economic assessment of the project is accurate. The AWSA, in partnership with the Ashland Ranger District, proposes to engage creative and experienced local forestry and wood products people with creative expertise within the Forest Service to:

1. Reduce the cost of planning and administering the sale as much as possible (ie. Tree marking strategies)
2. Develop a work plan which accurately and most efficiently achieves the stated goals and values of interested parties.

- The Alliance can effectively inform the public and facilitate a workable framework of agreement on values. We would represent and integrate those values in a collaborative planning process with FS experts.
- Alliance experts would be available to assist FS staff in selecting and implementing the appropriate economic evaluation methodologies to assist the decision making process.
- Experienced local forest contractors within the Alliance would be available to evaluate and establish the most effective and efficient means of implementing prescriptions on a unit by unit basis.

3. Apply federal funds to the most economically challenged units first.

Wild Land Fire/Hazardous Fuels Fund are down in the region 30% in fiscal year 2000 from fiscal year 1999, but the amount dedicated to the Rogue River National Forest is reported to have increased during that same period. These dollars are typically spent on fire hazard reduction in Eastern Oregon, where flatter terrain allows for more acres to be treated per dollar than on the more challenging slopes of Western Oregon. Before projects can be implemented, the agency is required to perform Survey and Manage research which is expensive and can drain a good deal of money from the intended work (opportunity for trained young people to perform some of this work).

The fund prioritizes its allocation of dollars with three values:

a) Wildlands which are at an urban interface,
b) Wildlands with fire dependent ecosystems from which natural fire has been suppressed
c) Wildlands which require maintenance to keep natural fuel loads in balance

The Ashland Watershed should score high on this priority list

4. Utilize existing authorities to design contracts which encourage contractors to accept the job, encourage creative marketing to maximize the value of the removed material, and to get maximum work for dollars invested. The Alliance would assist the agency in developing contracts which create the most desired economic incentives for the particular per unit conditions. Innovative, non-traditional contracting mechanisms which should be considered include:

    - *Service contracts with rights for removal*, (salvage rights clause) would allow contractors the right to remove trees from a unit if they can find a way to use or market the material.
    - *Service contacts* which enable the Forest Service to market the logs removed.
    - Timb*er sales* where sufficient value exists to cover the costs of unit treatment.
    - *Service contracts with an embedded timber sale*, where the contractor is paid to perform manual thinning and under-burning while paying a fixed price for the any timber removed
    - *Special Use* permits

Community Contracting to enable Local Investment

The Alliance will consider forming a non-profit , bonded general contracting arm which could bid on high priority, economically challenged units. Assuming that the cost of treating these units is not fully covered by Forest Service funds, these units would be of little interest to traditional contractors. However a, non-profit could accept funds from the City of Ashland, and donations from local citizens and businesses, which would help cover the shortfall. These locally generated dollars would only be used to pay regional, skilled forestry professionals as subcontractors to accomplish the work to the specifications established with the FS and Alliance experts.

The Alliance contracting arm would also be able to accept foundation funding to carry out educational and community involvement programs where skills and safety make it appropriate, engaging local citizens and youth to better understand and partake in the responsibility of stewarding the watershed in which they live.

Community Processing and Manufacturing to Add Value

An opportunity would exist for the Alliance to process and manufacture products from removed timber. The Rogue Institute for Ecology and Economy, an Alliance member, maintains a link with existing manufacturers and suppliers throughout the region with the capacity to add value and market the by-products fire mitigation work. These links could be utilized to generate high value products and thus a return to the Alliance to help offset the investment made into the reduction of fire hazard within the forest.

Stewardship Contracting on National Forests

Ashland Watershed Stewardship Alliance

The Ashland Watershed Stewardship Alliance (AWSA) and Rogue River National Forest (RRNF) cannot, at this point in the process, identify specific contracting authorities to guide the economic and ecological outcomes of the project. While AWSA's comment and proposal is being examined, participants in the project are studying existing federal authorities in order to identify potential contracting mechanism's which will be necessary to achieve the aforementioned stewardship goals.

The main sources of reference which will be used to guide our recommendations will include:

1) Federal Acquisition Authorities, U.S. Government.
2) Land Stewardship contracting in the National Forests, Pinchot Institute.
3) An Approach For Implementing Innovative Stewardship Projects On National Forests, Bill Wickman, USFS Region 5
4) The Wyden Amendment.

The Federal Acquisition Authorities are the regulations regulating government contracting. The Pinchot Institute publication is a complete and valuable guide for the innovative use of existing contracting authorities. It catalogues ways to use current-contracting laws in new and legal applications which parallel many of the goals and objectives outlined by AWSA in this document. The emphasis of this publication is promoting work design to benefit local business and workers, along with improving community and forest health.

The guide compiled by Bill Wickman addresses vegetation management and fire mitigation. It is both a manual on contracting mechanism and field work design. It has the added benefit of being written by a USFS employee. Mr. Wickman also has authority to travel to locations and advise federal agencies and community groups attempting innovative projects. A partnership between AWSA and the Ashland Ranger District should consider inviting Mr. Wickman to assist in this area as appropriate.

AWSA also is designing its proposals with the guidance of the Wyden Amendment. This amendment creates authorities to allow different government agencies and private land managers to combine and allocate funds to accomplish resource work. The Senator's Medford office is providing advice and support to AWSA and RRNF staff.

Many of the issues which challenge agency staff when attempting to engage community involvement and design locally beneficial stewardship opportunities are due to inconsistencies and interpretations of existing procurement authorities. The Alliance will engage experienced community members, congressional representatives and federal staff whom we have worked with in the past, in order to develop contracts which help the agency and the Alliance meet the stated ecological and social goals it has set for this project.

Youth Vision and Action

Ashland Watershed Stewardship Alliance

We envision:

Developing partnerships within the community supporting ongoing service learning opportunities for youth and young adults. Allowing students of all ages to pursue their individual and collective visions through learning opportunities in the watershed. For example, allow youth to learn through projects; surveys, fuel reduction, erosion control, monitoring, community involvement, and supervising volunteer efforts.

One of the Wilderness Charter Schools visions is the creation of a village style residential education program in restoration forestry, ecology, bioregionalism, living in community, communication, wood working, product development, and marketing. It is as much about restoring the land as our selves. By connecting with one another and the land, and by building a sense of community- we can create an ecological context for our lives.

We are the future stewards of the land and we are already having positive impact. We invite individuals, groups, organizations, and businesses to participate with us through mentorships, donations, and ideas.

Pilot Project for the Wilderness Charter School-

On November 19, 20, 21, Wilderness Charter School students will be guided by the following mentors: Marko Bey (Lomakatsi Restoration Project), Theresa Johnson (REAL Corps), Laurel Reuben (AWSA), and Tom Ward. The Charter School will be establishing a temporary restoration camp in the Ashland Watershed. Mentors will provide skills training in restoration forestry, watershed fuel-break maintenance, ecology, living in community, communication, woodworking, product development, and marketing. The public is invited to participate in the workday on Saturday, November 20 (See attached schedule of events).

REAL Corps Involvement in the Ashland Watershed-

REAL Corps has already established a clean record of involvement in the watershed including:

Rerouted ¼ mile segment of Toothpick trail.

Constructed 80 ft. of retaining walls and installed control structures in damaged areas to mitigate extensive erosion.·

Obliterated over 5 miles of illegal, user built trails in the Ashland Watershed by re-contouring the slope and placing large diameter material in path.·

Removed Manzanita shoots to maintain a 5 acre fuel break in the Ashland Watershed.

Removed Deerbrush (ceanothus) by "grubbing" below ground root collars from a 5-acre fuel break on the west side of Ashland creek.
Maintained 10 acres of the 25-acre White Rabbit fuel break. Grubbing Deerbrush (ceanothus) and cutting and piling excessive vegetation.

Conducted fish presence surveys in Ashland creek. Students worked in cooperation ODFW crews to map and document upstream fish migration.
Restored over 40 acres affected by landslides, which occurred during the New Year's Day 1997 flood. Members placed erosion control blanketing on hillsides, constructed over forty check dams and planted over 6,000 conifer trees to stabilize soil in drainage areas.

Participated in the first "Wyden amendment" project. The new authority gives the Forest Service the ability to enter into agreement with non-Forest Service landowners to accomplish watershed improvement projects. The Forest Service provided technical expertise and supplies, the City of Ashland purchased trees and plants and REAL Corps members installed erosion control matting and planted tree and shrubs. This project helped to restore 2 acres impacted by landslides above the municipal water treatment plant.

Potential Programs to Involve the Greater Community

Ashland Watershed Stewardship Alliance

The Alliance envisions developing programs that would engage citizens of all ages to participate in and learn about the fire mitigation work within the watershed. We see that, in collaboration with the Forest Service, the Alliance could seek foundation funding for many of these projects. What follows is a list of some of the projects we hope to se integrated into the forest work of the near future.

Educational Programs

- Wilderness Charter School in partnership with RealCorps (SOU) and Lomakatsi Restoration Project, currently working on private lands in the watershed interface; training for stewardship work: survival skills; first aid; community-building; tools handling; forest, watershed, and fire management.
- Rogue Valley Council of Governments' Bear Creek Watershed Student Council.
- World Wildlife Fund (Ashland office) proposed Student Environmental Stewardship program.
- Elderhostel and/or Senior Ventures (SOU) volunteer program, continuing a relationship already established with Rogue River National Forest.
- Elementary and secondary school tours offering studies in deep ecology, fire science, silviculture, physical geography (soils, hydrology, meteorology).
- Involvement of SOU student groups (up to 20) in their various fields of interest, ranging from economics and political activism to geography, ecology, and videography.
- Possible SOU Continuing Education courses in such subjects as ecology, environmental sustainability, watershed and fire management, etc.

Civic Program

- Foundation grants favoring broad-based community involvement to fund Alliance-to-Forest Service liaison team.
- Local economic development: creating jobs; occupational training and rehabilitation; Summer Youth Program partnership between Jackson County Job Council and USFS; new forest products development including flooring, fence materials, arts and crafts, wildcrafted medicinal herbs, horticultural products, teepee and vineyard poles, furniture, etc.; and innovative marketing programs.
- Recreational development of walking and biking trails; forest ecology study center.

Environmental Programs

- Fire protection and watershed maintenance funding and grants.

- Studies and protection of endangered animal and plant species.
- Habitat improvement for wildlife.
- Soils and microclimate inventories and monitoring.
- Hydrology studies and monitoring.

In addition to the local and regional sources of sponsorship cited above, our research has identified the following numbers of foundations making grants available in Oregon in these fields:

Higher education/environment	19
Environment/natural resources	47
Citizen participation	13
Wildlife preservation/protection	10
Economic development	10
Youth development	7

This research is ongoing. Some foundations list multiple fields of interest; in no case was any institution counted in more than two categories.

History and Structure of the Alliance

Ashland Watershed Stewardship Alliance

An informal group began meeting in March 1999 to facilitate the process of community response to the Ashland Watershed Protection Plan. The goal was to raise the level of dialogue through shared information and respectful listening. These first meetings took place at the invitation of Peace House and often included attendance by Ashland Ranger Linda Duffy. During the first six months, the group met twice monthly and grew to include city officials, business leaders, forest workers, environmentalists and other individuals interested in facilitating a community process. During this period, twelve meetings and three forest tours into the watershed helped to inform the group and provide opportunities for the sharing of ideas.

By September, the group had grown in number, skills and commitment. The release of the DEIS focused our need to develop a response. The Ashland Watershed Stewardship Alliance was christened and our vision and mission statements were adopted. Four ongoing committees (Tech, Communications, Economic and Youth) took on tasks. General meetings have been held weekly in addition to an arduous schedule of committee meetings. A decision making model was chosen that reflected the strong value the group placed on community process, but also the time constraints under which it must operate. Decisions by the Alliance are made on the basis of a 3/4 majority vote of active members, defined as having attended at least three meetings since September. A quorum of 50% of the active members are necessary. Minority concerns are respectfully reflected in the minutes. (It should be noted that every vote to date has had at most 2 members in opposition.) At this time, the Alliance has 38 active members and a mailing list of 101 who receive minutes. Weekly meetings have had an average attendance of 30.

Letters of Support

Ashland Watershed Stewardship Alliance

Approximately 50 people have been involved in weekly meetings for over 4 months, and a smaller group for over 9 months, to create the relationships and foundation for understanding which was necessary to enable the compilation of the level of experience, thought and content which is documented in this comment and proposal.

Many of those individuals and organizations affiliated with the Alliance have included their own letters of support for the process we have developed and often struggled with. Please accept their thoughtful words.

Volunteer Support and Donations

Ashland Watershed Stewardship Alliance

In kind time and monetary support as of November 19,1999

Volunteer time -	1,402 hours
Financial support –	$23,183

Team Member Profiles

Ashland Watershed Stewardship Alliance

The strength of the Alliance comes from its large and diverse membership which has been able to review and refine the work performed within its teams designated to study and develop comment on the Draft Environmental Impact Study. We wanted to detail a few of the members of these committees to document the level of professional and experiential knowledge brought to this comment and proposal.

AWSA Technical Team Members

Richard Brock -- is a consulting botanist/plant ecologist who has worked in the forests of southwest Oregon for 22 years in many capacities including reforestation, timber stand improvement, private forest management planning, biological inventory and plant community surveying.

Carol Carlson – brings 20 years of organic gardening/farming experience to this land management effort. She joined the Tech Team in order to understand the natural processes at work in the Watershed, and to find "on the ground" ways to take responsibility for the ecosystem in which I now live. She works as a plant propagator of native species at Plant Oregon, in the Ashland Massage Institute office, and also volunteer at the N. Mountain Park Natural Resource Area.

Jeff Fields – Is the Rogue Institute for Ecology and Economy's Community Forester. His prior experience includes staff forester for the University of Idaho's Experimental Forest; forest and appropriate technology researcher in Guinea, West Africa; owner and principal of a small forestry services contracting business; Peace Corps Community Forestry agent in Nepal; and several seasons of fire and timber management work with the US Forest Service. Jeff has a MS in Forest Resources (1995) from the University of Idaho, and a BS in Forest Management (1988) from the University of Wisconsin at Stevens Point.

Richard Hart –has an MS in Ecclesiology. Taught forest ecology for 9 years and co-founded the Redwood Coast Watershed Alliance. Richard has been staff ecologist at Headwaters for 8 years. He is also a member of Southern Oregon Province Advisory Committee to the President's Northwest Forest Plan, and a member of the Forest Stewardship Council's Pacific Forest Guidelines Working Group.

Howard Heiner –has a wide variety of experience in both national and international forestry work. He is presently the Executive Director of the International Union of Societies of Foresters, and a forestry consultant for the FAO Forest, Trees, and People Program. Previous experiences include consultancies in agroforestry and fire hazard reduction in Nicaragua, director of a refugee program in Somalia, forest products business owner, and forestry instructor at the technical school and university level in Latin America.

Laurel Reuben – Since 1977, Laurel has worked as a wildlife technician on research and management projects for several wildlife and land management agencies. Beginning in 1990, she has been self-employed as a natural history and multi-cultural educator, contracting with non-governmental organizations, government .agencies, Indian tribes, and private landowners to develop and implement wildlife survey plans, riparian restoration projects, and K-adult environmental education programs. She travels regularly to Latin America to participate in conservation and human rights programs. She has a BS in Environmental Studies and an MS in Education. She has been active with citizens public lands conservation groups for 22 years. She moved to Southwest Oregon from Northeast Oregon in August, 1999.

Tom Ward – has resided in the Ashland area for twenty five years and has explored the surrounding wilderness and foothills with an interest in the plant diversity and geology. He is a trained forester and botanist (SUNY College of Forestry at Syracuse Univ. BS 1969) and now helps landowners with planning and implementation as a permaculture counselor.

Marko Bey
Bill Robertson
Marty Main

Economics Team Participants

John M. DeVilbiss--Visiting Scholar position with the Institute of Forestry, Tribhuvan University, located in Pokhara, Nepal 1994. In that position I taught economics courses and lectured in community forestry, while organizing research projects in natural resource economics and community forestry.
-US Forest Service in the Rocky Mountain Region, 1970-1994 (Retired, April 1994)
Regional Economist for the Rocky Mountain Region, 1980-1994. Responsibilities for overall economic analyses involving national forest planning and program and project level planning on twelve National Forests and Grasslands.

Forest Planning Team Leader, Arapaho and Roosevelt National Forests, 1977-1979, and forest planning interdiscipli9nary team member (social /economic analyses), 1975-1977.

District Forester, Arapaho and Roosevelt National Forests, 1970-1975, in timber management, recreation and lands management and fire control.

Academic background: PhD, Natural Resources Economics, MS, Economics: BS, Forest Management.

Clifford Dickason is a retired water resources research economist with the USDA's Economic Research Service (ERS) from 1964-1994. Mr. Dickason worked with Forest Service economists on several of what are called "River Basin Studies".

Mark Stella is a product designer and developer, working with the Rogue Institute for Ecology and Economy to create rural business incentives and opportunities which encourage sustainable local forest resource use. He brings to the Alliance his experience with project coordination and facilitation as an international design consultant in Portland and on the East Coast. He also brings the values and knowledge gained from working and living in the forests of the Western Cascades on a 4 year sabbatical, helping to develop a non-profit educational facility in the heart of the Opal Creek Wilderness Area, and working to bridge the gaps between that venture and the people of the local logging communities.

James Moore
Carole Wheeldon
Nancy McGinley
Jake Crabtree

Communications Team Participants

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