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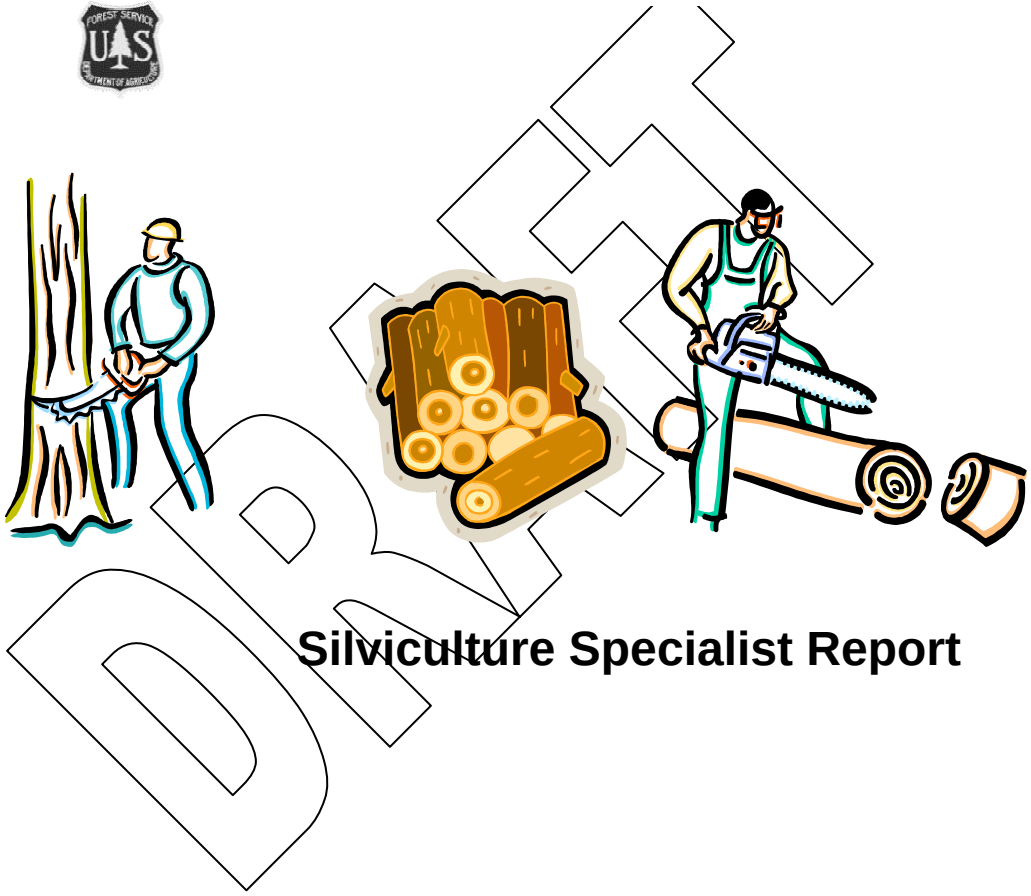
Preliminary Environmental Assessment

Silviculture Specialist Report



Silviculture Specialist Report

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__March 15, 2006_

NOTE: Sections/paragraphs in **bold type** are the most that belongs in an EA. The rest is supporting documentation - WYNN

Abstract

Forest stands in the Ant analysis area, are currently in a mixture of conditions of stocking levels, insect and disease incidence, and species mix. Conditions in a majority of the stands are not considered sustainable, and are not within the historic range of variability for this corner of the Southern Blues. Accepted silvicultural treatments of thinning to reduce stocking and change species mix, are recommended to meet the stated project goals.

There are many more conifer trees in the uplands and riparian areas that there were in historic times. This has had two major effects on the riparian hardwood trees and other plants:

- **It has substantially reduced the amount of rain & snow moisture that reaches the riparian areas, and those in the lower elevations are now dry for most of the year, reducing the water for aquatic plants and animals. This has also reduced aspen, willow, and other riparian plants, and indirectly eliminated beavers from many streams within the analysis area. This in turn, further lowered the water table in the riparian area, and further reduced riparian plant numbers and extent.**

- **It has increased shade in the uplands, which has reduced shrubs, forbs, and grasses. In addition to being outside of historic conditions, this has reduced forage available to big game and livestock.**

The tree density is also preventing development and survival of the large trees that provide the "old growth" character needed to meet the tree component of the Historic Range of Variability (HRV).

Correcting this condition will require killing a large proportion of the conifer trees by fire or mechanical means, or a combination of the two. To be most effective, treatment must include reducing conifer density in riparian areas.

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INTRODUCTION

The Ant analysis area consists of the portions of the Whiskey Creek, Foundation/Spring Canyon, and Blue Creek Subwatersheds of the Emigrant Creek Watershed, that are north of Emigrant Creek proper.

[I am attaching the stand table at the end of your paper copy, with a staple – WYNN]

Affected Environment

EXISTING CONDITIONS

Forested areas of the analysis area contain more than 300 individual timber stands representing four plant association groups (PAG): Dry Grand Fir, Ponderosa Pine, Douglas-fir, and Juniper. Grand fir PAGs dominate the higher elevation sites, and Ponderosa Pine PAGs dominate the lower elevations. Douglas-fir PAGs bridge the two. Juniper is the transition PAG from all of the above to non-forest conditions. Topography is broken, and there are abrupt changes in PAG with aspect and elevation.

Ponderosa pine dominates the drier PAGs in all size classes. On moister sites, grand/white fir is the dominate tree in the understory, and ponderosa pine is the dominant tree in the overstory, where there is an overstory. Douglas-fir, lodgepole pine, juniper, aspen, and western larch, are also present on suitable sites.

All forested areas have a variety of insect and disease pests, as "agents of change," to supplement the primary natural disturbance which is wildfire.

Bark beetle activity is historic, present, or predicted, for all overstocked stands. Defoliating insects are endemic to all mixed-conifer stands, though no outbreaks have occurred in the past decade. All of the insect pests are sensitive to stocking level controls, and future mortality and growth loss can be minimized by thinning to give the desired trees (size and species) adequate growing room.

Dwarf-mistletoe has infested pine, Douglas-fir, and larch. Infestation ranges from heavy to none. In lightly infested stands, mortality, deformity, and growth loss, can be minimized or almost eliminated by removing infested trees during harvest and precommercial thinning, and favoring uninfested and unsuitable host trees as leave trees during all management activities.

Fungal tree diseases are also present in some trees at some locations. Indian paint fungus (*Echinodontium tinctorium*) is present as a heart rot in grand fir, usually infecting only large decadent trees, and smaller trees with logging damage or frost cracks. Infected small trees have little or no net volume growth, so removal is usually prescribed in harvest and thinning operations. Large infested trees typically have little commercial value, so are usually left to provide wildlife habitat.

There are also pockets of the ponderosa pine root diseases *Fomes Annosus* and black stain (*Leptographium wageneri*). *Fomes* root disease kills portions of the tree's root systems, and weakens root structure, resulting in slow growing trees that eventually fall over. Both "P" (infects ponderosa pine) and "S" (infects true firs) types of *Fomes Annosus* are present. Black stain kills trees. Favoring non-susceptible tree species in root disease pockets, can minimize the long-term effects. Sprinkling borax powder on larger fresh pine stumps (12" diameter and larger) can prevent inoculation by *Fomes*, and reduce creation of new infection centers.

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Timbered areas fall into six general types. Each type is briefly described below, followed by a prediction of what will happen with no management action, and with the treatment recommended in the TREATMENT RECOMMENDATIONS section. Statements about HRV are information, not a recommendation or validation that HRV would or should be the treatment goal embraced by future long-term management planning.

1) Stands where 1980's and 1990's timber harvest removed the overstory, followed by precommercial thinning in the understory. Stands tend to be growing well, and the species mix is closer to HRV than in untreated stands. Dwarf-mistletoe is present in some stands. These stands tolerate fire (wild or prescribed) and moisture stress much better than unthinned stands**.**

PROJECTION: Without treatment, most of these stands will continue growing well, and remain vigorous for 5-20 years, depending on when they were thinned. The most recent thinning has the longest projected period of vigor.

With treatment (prescribed burning to reduce fuel loadings and seedling density), vigor and sustainability can be maintained, and HRV can be reached sooner.

2) Stands that were harvested and precommercially thinned prior to 1980. Scattered overstory trees remain. These stands are now overstocked with 8-16 inch diameter trees, are ripe for bark beetle infestation, have lost much (but not all) of their tolerance for fire, and crown closure is such that not enough light gets to the ground to allow shrubs and grass to prosper and spread.

PROJECTION: Without treatment, tree growth rates will slow dramatically (if they haven't already), shrubs and grass will continue to decline, and bark beetles will thin these stands; if wildfire or humans don't do it first.

With treatment (primarily stand improvement harvest, and underburning) vigor and sustainability can be restored, and HRV can be reached sooner.

3) Multi-story stands (a mixture of big, small, and medium-sized trees) which have been subject to previous sanitation harvest, but no understory treatment within the past 30 years (if ever). Some of these stands are located on steep slopes. All are characterized by a dominant large tree overstory, and overstocked small tree understory. Wildfire tolerance is very low. , and mistletoe is present in most stands to some degree. Overstocking has resulted in slow growth rates, increasing bark beetle activity, and less dense shrub and grass cover than was historic on these sites. Slow growth has combined with Indian Paint Fungus in true firs, to create a situation where there is no net growth in some of the trees.The number of future large trees is limited by the slow growth of the smaller trees, and survivability of existing large trees. These stands make up much of the timbered acreage which has reduced the amount of water reaching the riparian areas, when compared to the historic period prior to the application of fire suppression on the Malheur National Forest.

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PROJECTION: The natural correction for this condition is wildfire or insect epidemic that removes portions of the stand, and prepares the site for plant succession. If the stands avoid wildfire, growth will remain slow, large overstory trees will die without suitable replacements, bark beetle activity will increase the dead fuel loadings, mistletoe will continue to spread, and shrubs will disappear except under holes in the tree canopy closure.

With treatment (A full set: improvement harvest, thinning small trees, and underburning), vigor and sustainability can be restored, increased light will cause increases in shrub and grass growth, and both growth and survivability of large trees can be enhanced. An exception would be locations where large trees (21"+) occupy too much site for full recovery of vigor in the residual trees.

4) Stands that were historically open pine stands, or pine savannah. The absence of fire has allowed establishment of a dense understory of small pine, juniper, and mahogany. The pine and juniper understory occupies the sites at levels up to a hundred times the per acre stem counts that occurred historically on these dry sites (USDA Forest Service, 1917), and has shaded out the grasses and small shrub stand components**.**

PROJECTION: Overcrowding will continue to stress the large overstory trees until they are killed by bark beetles, or wildfire replaces the stand with grass and shrubs. In the absence of fire, existing grass and shrub density will be further reduced from historic densities.

With treatment (A full set: improvement harvest thinning, thinning small trees, and underburning) tree vigor, sustainability, and shrubbery diversity can be restored. An exception would be locations where large trees (21"diameter+) occupy too much site for full recovery of vigor in the residual trees.

5) Juniper-dominated stands. Present stocking levels are far above historic levels (USDA, Forest Service, 2003), and stocking is primarily small trees rather than the scattered larger dominants found on these sites prior to fire exclusion.

PROJECTION: The natural correction for this condition is wildfire that removes portions of the stand, and prepares the site for plant succession. If the stands avoid wildfire, growth will remain slow, and larger trees will die without suitable replacements. Other plant components will be further reduced (density and extent) by stresses caused by soil moisture uptake by juniper.

With treatment (thinning or removing small trees, and underburning), vigor and sustainability can be restored, and both growth and survivability of larger trees can be enhanced.

6) Riparian stands; primarily ponderosa pine, with localized juniper, and isolated aspen and willow components. Individual stringers and groves are not specifically isolated on Table One. Aspen, willow, et al, are decreasing in response to at least 50 years of declining water tables in drainage bottom soils. This has been caused by stream down-cutting, and increases in tree density in the uplands. Pine and juniper densities are

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increasing in the stream bottoms as water tables drop, and this additional shading and water uptake are changing the riparian vegetation.

PROJECTION: The natural correction for this condition is wildfire or insect epidemic that removes portions of the upland stand, and increases water percolation into the riparian areas, which drowns the conifers. If the stands avoid wildfire, water tables will continue to lower, and pine and juniper density will continue to increase as riparian vegetation density continues to decrease.

With treatment (A full set: improvement harvest thinning, thinning small trees, and underburning)in the uplands AND the riparian areas, some moisture and vegetation changes are possible. This situation would require more than just thinning and burning. Some other actions are needed, including (but not limited to) stream course restoration, beaver reintroduction, instream structures to slow runoff velocity, and planting/seeding of the now missing plants. Many of these will require more time than the Ant Vegetation Management Project, but need to be mentioned here.

Table One is the stand listing for the analysis area. It also lists treatment priority ratings, and the most likely silvicultural treatment recommendations for both the merchantable component and the unmerchantable understory (see the TREATMENT RECOMMENDATIONS section). Some stands have since been (or will be)subdivided beyond the Table One listing, in response to specific management objectives; i.e. wildlife travel corridors, and Riparian Habitat Conservation Areas.

Stringers, clumps, and small timbered areas, are generally not included on the stand listing or stand mapping, since they are not manageable as separate timber stands. These areas are providing diversity, screening, and some big game cover, and should be left untreated for this entry, except where incidentally included in landscape burning, or specifically treated to improve riparian conditions.

DESIRED CONDITIONS

The primary goals for the timbered areas in the analysis area are large healthy trees, and healthy crown closure. It is also desirable that vegetation changes be made toward the stand conditions referred to as the Historic Range of Variability (HRV). Healthy trees of all sizes and species are needed to attain the desired conditions. HRV analysis also indicates that there is a substantial shortage of stands with the single-story structure common during any of the different time periods used as baselines for HRV.

OPPORTUNITIES

Local insect pests are sensitive to stocking level controls. Future mortality and growth loss could be minimized by reducing stocking levels, to give the desired trees (size and species) adequate room to grow into the large trees needed to meet HRV. Harvest could be used to reduce stocking levels in the merchantable trees, and precommercial thinning would reduce the stocking levels in the submerchantable trees. Thinning in stands lightly infested with dwarf-mistletoe, can nearly eliminate

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mortality, deformity, and growth loss, by removing infested trees, and favoring uninfested and unsuitable host trees as leave trees during all management activities.

Treatments should result in maintenance of later seral stand structure when present, or development of the large tree stand structure where it is absent. Treatment results should be at least a partial conversion toward a single-story condition from the present multi-story situation.

TREATMENT PRIORITIES

Timber stands were evaluated separately on the condition of the commercial and the subcommercial components. For purposes of this analysis, "commercial" refers to trees 7" dbh and larger, and "subcommercial" refers to trees smaller than 7" dbh. Each component of each stand was assigned a treatment priority based on the following (see Table One):

PRIORITY #1: Treating this component of the stand would have a positive influence on the stand meeting the future need for large trees, crown closure, and the species mix to meet HRV. Conversely, failure to treat this stand component would have a negative influence on meeting these needs.

PRIORITY #2: Treating this component of the stand may have a positive influence on small portions of the stand meeting the future need for large trees, crown closure, and species mix to meet HRV. Failure to treat this stand component would have a small localized negative influence on meeting these.

PRIORITY CODE #3: This component has been treated previously, or treatment would have no positive influence on the stand meeting future need for healthy large trees and crown closure, and the species mix to meet HRV. Conversely, doing no treatment would have no negative influence on meeting these needs.

Assignment of a Priority #1 or #2 to the merchantable component of a stand does not make any implications in regards to economic viability for timber harvest.

TREATMENT RECOMMENDATIONS

All proposed treatments would be directed at reducing or maintaining stocking levels, and correcting species composition that does not conform with HRV. Reductions in dwarf-mistletoe would be a secondary result in most applications. Harvest would be used to reduce stocking levels in the merchantable trees, precommercial thinning would reduce the stocking levels in the submerchantable trees, and prescribed burning would reduce stocking levels of seedlings. All treatments would/should:

- **Favor the species mix needed to reach HRV.**
- **Reduce insect and disease influences within the stand.**
- **Maintain single-story stand structure when present.**

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- **Develop single-story stand structure where it is absent.**
- **Result in maintenance of later seral stand structure when present**
- **Develop large tree stand structure where it is absent or dying out.**
- **Reduce the potential for stand-replacement wildfire.**

All pine-dominated stands should be considered for prescribed burning to return this historic disturbance agent in a situation less intense than that which would result from wildfires.

Stands with overstocking in trees 7-20.9 inches in diameter would be thinned using an improvement harvest (HIM), or a commercial thin (HTH). Marking guides would reduce stocking by either crown spacing, or bole spacing. In Riparian Habitat Conservation Areas (RHCA's), and areas with visual quality concerns, harvest would only remove trees with crown overlap with a larger tree (HTHO on Table One). In other areas, harvest would remove merchantable trees to leave adequate space between residual trees to allow good growth, and growing room for smaller components. Stocking would be reduced to a specific level in areas of overstocking. These are list on Table One.

Precommercial thinning of trees 7`` dbh and smaller, would occur following timber harvest, or independently in stands not suited for timber harvest. Spacing applied to this project would be crown spacing ranging from 5 to 15 feet, with the wider spacing in the areas with the least moisture. Narrower crown spacing would be applied in RHCA's, visual corridors, and designated big game travel corridors. Approximately 10-15% of thinning subdivisions would be left unthinned for diversity, screening, and big game cover.

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GLOSSARY ITEMS FOR ANT Environmental Assessment:

Single-story stand *= A timber stand where most trees are within a single size range, though they may not be exactly the same age. A single-storied stand of large trees, is one shortage identified by HRV analysis.*
Multi-story stand *= A timber stand of trees of more than one size. For Dairy, this describes a stand with a mixture of seedlings, small trees, medium-sized trees, and large old trees.*
Pine Savannah *= A grass-dominated plant community with pine trees as one component, but not the dominant one. Less than 10% pine crown closure, primarily medium and large trees.*

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TABLE ONE INFORMATION

Blanks on **Table One** indicate that data is unavailable, non-relevant to analysis, or overshadowed by a datum entry in a different column, or a different row. Any BOLD notation explains why analysis did not proceed further or broader on each stand.

There are some unresolved and duplicated stands on this table. Some are on the list identified by a stand exam number, and on again as a numbered timber harvest unit, and possibly with a stand number from notes made by the previous two silviculturists assigned to this project.

Major changes/improvements were made in GIS records **after** this table was initially built in 2000. Those involving proposed treatment units, have been incorporated in Table One. Many other stands retain everything as recorded in 2000, from 2000 mapping.

Table footnotes:

* With reductions for any RHCA that gets treated
** No separate individual stand data sheet
*** Do not exclude from landscape burning projects – Mother wouldn't.

ANT STAND LIST ABBREVIATIONS

AOG = Allocated Old Growth.

FUEL = Slash/limbs, etc. created by the treatment.
GP = Pile slash with a grapple machine.
HIM = Improvement Harvest
HNT = No harvest treatment
HP = Pile slash by hand.
HTH = Commercial Thinning

LOP = Treat fuels by cutting into small pieces, and leaving them to rot.
LOS = Late and Old stand structure (dominated by big trees).
MBF = Thousand board feet

MSWLT = Multi-storied with some large trees.
MSWOLT = Multi-storied without large trees.

NT = No Treatment
O.S. PRI = Treatment priority for trees greater than 7`` dbh.
O.S. Rx = Preliminary treatment prescription for trees larger than 7`` dbh.
PAG = Plant Association Group
PCT = Precommercial thinning

RHCA = Riparian Habitat Conservation Area
SECC = Stem exclosure, closed canopy
SEOC = Stem exclosure, open canopy.
SP = Same as PCT

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UB = Underburn
U.S. PRI = Treatment priority for trees less than 7`` dbh.
U.S. Rx = Preliminary treatment prescription for trees less than 7`` dbh.

V.E. = Viable Ecosystem
VPA = Harvest volume per acre, in MBF
VS Code = Vegetation Structure code (from Emigrant Watershed Analysis)
MSWLT = Multi-storied, with large trees (old forest with large trees common)
MSWOLT = Multi-storied, without large trees (young forest, few large trees)
SEOC = Stem exclusion open canopy (new seedlings discouraged)
SECC = Stem exclusion closed canopy (new seedlings discouraged)
SI = Stand initiation (baby trees following a disturbance)

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References

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USDA Forest Service. 1997. Emigrant Creek Watershed Analysis Report, Ochoco and Malheur National Forests.

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