Appendix F

Silvicultural Specialist Report

Resource: Silviculture

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Introduction:

The basic policy for the management of public domain forest lands is set forth in the Federal Land Policy and Management Act (FLMPA) of 1976 which requires public lands to be managed under the principles of multiple use and sustained yield without permanent impairment to the productivity of the land and the quality of the environment. Within this broad directive, it is the Bureau of Land Management's (BLM) policy to manage the timber resources under the principles of multiple use and sustained yield; obtain fair market value for timber and other forest products sold and removed; improve forest stand health and to facilitate the management and public use of forest lands.

Also, "manage these commercial forestlands for the commercial tree species." This Little Canyon Mountain (LCM) area is included within the identified "30,962 acres available for full timber production." "Manage forestlands to minimize losses or damage to commercial tree species from insects and diseases" John Day RMP, ROD, Page 13, 1985.

a. Past Management Actions

Recently (October, 2002) the LCM forest stand has been pre-commercially thinned along the north boundary between BLM and seven private residences. This fire break treatment consisted of removing most juniper trees, pre-commercial thinning (<12 inches dbh (diameter breast height)) live trees to a 12'x 12' spacing, pruning all live and dead trees up to 8-10' above the ground, removing most brush (except broad leafed trees), and hand piling all slash (existing and newly created) less than 9 inches dbh. This action was intended to be the first step in creating a firebreak along this urban interface.

Beyond this treatment, there has not been any actions taken that mitigates the presence of insects or pathogens in this ponderosa pine stand. However, a one-time entry over story removal did take place on 145 acres in 1967. A total of 541 thousand board feet (mbf) of ponderosa pine was removed. This type of harvest activity was intended to remove potential hazard trees from the forest in order to provide a safe environment for the mining and recreational activities within the area.

Prior to 1967 some harvest of younger trees had taken place. Mining activities (1860's – 1930's) used some of the tree vegetation to produce timbers for the mining operations. Since the 1960's non-commercial firewood permits have been issued. These firewood permits allowed for the removal of dead Douglas fir trees. The most prominent firewood area is above the spring area in Section 7. During the early 1980's the spruce budworm infested a stand of Douglas fir. The active removal of these dead and dying Douglas fir trees (through firewood permits) resulted in confining this insect epidemic to an area of approximately 5-10 acres.

Also, current mining activities occasionally require the use of Douglas fir trees for producing mining timbers. Douglas fir materials are stronger and longer lasting than ponderosa pine when the processed logs are used as support timbers in mining tunnels, etc. Occasionally, when Douglas fir trees are not present on a mining claim, that particular mining operation may require the removal of ponderosa pine trees which are then exchanged to a local sawmill for finished Douglas fir timbers.

b. Brief Existing Environment / Condition on BLM Lands

The LCM stands are experiencing significant tree mortality in the ponderosa pine component due to a complex of four bark beetle species (pine engraver, red turpentine beetle, western pine beetle and mountain beetle). Most of this mortality has been very recent, within the last two to three years, and beetle populations are increasing. Many residual pine trees are only carrying the most recent years foliage in their crowns and do not appear to be in a sufficiently healthy condition to withstand the increase in bark beetles that is occurring. An increase in tree mortality is expected to continue in these stands if the basal areas are not reduced, especially if drought conditions continue.

As was discovered by a recent stand exam by a crew of BLM foresters (completed 9/20/02), the basal areas within this analysis area range from 100-200 square feet per acre. Basal area is the square footage of wood fiber that occupies a given space. For an explanation of basal area (BA) and basal area factor (BAF), see Attachment No.5. As a result of the basal areas within this project area, the trees within this stand are showing signs of poor individual tree vigor. Trees are currently growing at the rate of 20-50 growth rings per inch. Tree vigor of less than 13 growth rings per inch is necessary for a stand density that in turn controls the habitat conditions for insect propagation.

c. Detailed Existing Environment / Condition on BLM Lands

These stands of ponderosa pine and Douglas fir are on the lower elevations of the north face of LCM. "The stands that are most susceptible to moisture stress, insects, and diseases, tend to be those at the lowest elevations, which typically border private, state tribal or other land ownerships. Homes, private, tribal, and state forest resources; wildlife winter ranges; and other important resources are increasingly at risk from fire and insects and disease attacks" ICBEMP, Draft, Volume 1, Chapter 2, page 72, 1997. The average age of the ponderosa pine within this stand is approximately 110 years and the average total tree height is approximately 68 feet (Stand Exam 9/20/02). Therefore, the site index for this LCM project area is approximately 65. "Base site index on the total height of dominant and co-dominant trees at 100 years of age" (BLM Manual, 5612-Ponderosa Pine, page .33F1c, August, 1970) (Also, BLM Manual, 5612,

Table 2, page .34D3). Bark beetles thrive in stands of poor vigor, i.e., stands beyond their Upper Management Zone (UMZ). "UMZ is the stand density at which co-dominant trees are growing at 1 - 1 ½" in diameter in a decade (13 growth rings per inch)" (Andy Eglitis, Forest Insect Concerns, page 4). Growth rates in this LCM stand range from 20-50 growth rings per inch (Stand Exam, 9/20/02).

The trees in this stand are less than 140 years old and appear to have originated through natural encroachment from the higher elevations. The pines are of various sizes, which range up to 40 plus inches dbh. Douglas fir trees are generally smaller and less abundant than the ponderosa pines. There has been limited harvest entry, with some over story removals in 1967. The residual stands are fairly dense and are probably well above the long-term carrying capacity for this site. Many of the ponderosa pine crowns contain only the most recent year's needles, a condition that could be the result of one or more factors: the recent drought in the area (see Attachment No. 1), a possible needle cast disease, and genetics.

This LCM stand is presently rated catastrophic. For an explanation of catastrophic, see Stand Rating System – Attachment No.6, and Schmitt and Scott, October, 1993.

Ponderosa pines of epidemic proportions of all sizes have died within the past three years. In addition, many other trees have dead tops with some live branches below. There is evidence of four bark beetle species in this stand. These include the pine engraver (Ips pini), the red turpentine beetle (Dendroctonus valens), the western pine beetle (Dendroctonus brevicomis) and the mountain pine beetle (Dendroctonus ponderosae). The pine engraver is the most common bark beetle and is the most likely contributor to the top kill in the ponderosa pine. Even though the pine engraver is generally found in smaller diameter host material, trees in the LCM stands are infested with these bark beetles in the upper boles of larger trees. The red turpentine beetle is present in most trees infested by Ips pini. They are easily recognized by the large pitch tubes at the base of the tree. Most of these pitch tubes are very fresh and some contain live turpentine beetles indicating that the attacks had occurred this year, probably in response to the weakening of the trees by engraver attacks from the previous year. A very common condition in these ponderosa pine is extensive top kill, with few live green branches below, heavy turpentine beetle attack at the base, and the presence of bark beetles at mid-bole. Portions of these trees are presently alive but will very likely be completely dead next year or the following year, due to the heavy damage they have already sustained and due to very little viable crown remaining.

Some trees have been infested and killed by the western pine beetle and by the mountain pine beetle. The mountain pine beetle is generally found in smaller trees, but in this stand is occasionally found in larger boles.

There is evidence of trees infested and killed by bark beetles this year but are still retaining a green crown. These trees are expected to discolor late this year or early next year.

d. Detailed Existing Environment / Condition on Other Private Lands

Adjoining private lands to the north and east of this project area are also experiencing tree mortality due to this insect infestation. Some private landowners have treated their stands over the past 1-10 years by reducing tree densities and by treating slash in an effort to reduce brood sites for these insects. As a result, the private land insect infestations are much less extensive than the infestation within the LCM project area.

e. 1) Future BLM Management Actions (1-5 years)

The only ongoing forest resource management action within this LCM planning area has been firewood sales to private individuals. Material removed for firewood has been primarily insect killed pine and fir. This action is expected to continue as long as insect infestations are permitted to continue. The future stand would vary randomly throughout the LCM area. Pockets of heavily infested and dead trees would eventually be gone to firewood cutting activities or the trees would eventually fall to the ground and add to the current fire loads.

e. 2) Future Private Management Actions

Some adjoining land owners have chosen and will most likely continue to treat their stands of ponderosa pine in order to limit the stands vulnerability to bark beetles. The treatments will likely include thinning and possibly salvage of trees previously infected by bark beetles. These management actions would probably not have a bearing on the fate of stands within the LCM planning area. An exception to that statement could arise if adjoining land owners choose to carry out thinning treatments and leave slash in their stands at the improper time of the year (January thru June). Material left on the ground at this time of year would likely provide habitat for pine engraver beetles which could increase in numbers and provide an additional threat to nearby stands in the LCM area once the emerging beetles fly from that material in search of new hosts to colonize.

f. Environmental Affects Alternative A - No Management Action

i. Direct Effects: By allowing insects to do the density control, we would be risking losing most of the forest stand, including trees of all sizes, to insects and possibly more or all of the stand to catastrophic wildfire. Much of the tree mortality has occurred in the past one to three years and the population of bark beetles is building rapidly in the area. Until the current drought period ends, additional trees are very likely to be infested and killed next year and in subsequent years. It is difficult to predict how many trees are likely to die, but an additional loss of two to four times the current level of tree mortality would be likely if no action is undertaken.

   In addition, the forest ecosystem would be altered extensively by the alteration of stand structure and continuity. The many openings currently created by insect damage would eventually grow in size and create an insect killed band across the lower slope of the mountain. In the long term (5 years plus) this insect infestation would be expected to expand up the mountain as well as to the east and west.

ii. Indirect Effects: The "thinning" effect produced by the bark beetle infestation will create openings in the stand that will provide some diversity and will cause the release of under story shrubs and non-host trees (Douglas fir / white fir). Insect thinning would kill randomly in patches and would affect trees of all sizes. There has been and will continue to be a significant increase in dead fuels resulting from the bark beetle caused mortality. Dead trees can be expected to remain standing for approximately ten years and over time there will be an increase in down wood.

iii. Summary of Impacts of No Management Action: If no thinning treatments are carried out, there will be additional mortality in the ponderosa pine component of these stands. Although it is not possible to predict how extensive this mortality will be, it can be expected to be a two to four fold increase above the mortality that has already occurred. Many of the trees that die are likely to be the largest trees in the stand, given that much of the recent mortality has included trees of large diameter (32 " dbh plus). These larger trees are growing less vigorously (20-50 growth rings per inch) and, therefore, have a lower resistance to beetles than do younger trees because these larger diameter trees contain larger inner bark surface areas which are capable of producing large numbers of bark beetle brood.

h. Environmental Affects Alternative B - BMBP

1. Treat up to 1000 feet inside boundary

i. Direct Effects: Treating up to 1000 feet inside the boundary would do very little in addressing the fire hazard and insect epidemic that exists throughout the project area. Insect damages would continue to expand. "Overstocked stands result in moisture stress in the normal summer drought period and make stands highly susceptible to bark beetles" ICBEMP, Draft, Volume 1, page 69, 1997."When bark beetle mortality reduces stand density in unthinned stands" (area outside the 1000 feet) "some of the best trees are lost, and the mortality often occurs in clumps, resulting in uneven distribution of growing space among remaining trees" (Cochran & Barrett, page 23, Conclusion, 1999).

Many of the trees that appear green throughout this entire stand are exhibiting symptoms of stress (drought, competition, etc.). Some trees are retaining only 1-2 years of needles when they should be retaining 4-5 years of needles. "Normally a healthy ponderosa pine retains 4-5 years worth of needles. Every fall the oldest needles will die and turn brown. Every spring a new compliment is produced. This is the normal process:" (Dr. Jill Wilson, 1990). These trees are under stress and are highly subject to the expansion of the current insect epidemic. According to the most recent stand exam (9/20/02), the growth of the trees in this stand is severely stressed. Trees are currently growing at the rate of 20-50 growth rings per inch. Less than 13 growth rings per inch is ideal for stand (tree) vigor and, therefore, insect control (Andy Eglitis, Forest Insect Concerns, page 4).

ii. Indirect Effects: Much of the stand (20-50%) would be lost to insects and this would add to the current fire hazard conditions that are a threat to the neighboring private lands and structures.

iii. Design Criteria or Mitigation: Since one of management's goals is to manage this stand to reduce and control the insect infestation, the entire stand should be treated. "The best treatments are preventative. It is very difficult to prevent mortality from occurring once beetle populations have risen to epidemic levels. Healthy, vigorously growing trees will best withstand the effects of drought. When the trees are severely stressed by drought, disease, competition, etc., fewer years of needles are retained. Growth, both height and diameter, is reduced. Production of natural defense chemical, which normally confer resistance to insect attack, is also reduced" (Dr. Jill Wilson, 1990).

Also, "If managers wish to retain trees with large diameters, stands need to be managed so that they do not become susceptible to serious pine beetle outbreaks" (Cochran & Barrett, page 24, July, 1999).

iv. Summary of Impacts: "a catastrophic designation will require prompt action to recover merchantable wood fiber and prevent additional damage, or to reduce wildfire potential" Schmitt and Scott, page 6, October 1993. Limiting treatment to 1000 feet inside the planning area boundary (1,144 acres) would leave the remaining area acres to passive management. "If we continue the current passive management approach, forest-health conditions can be expected to deteriorate, and forests will continue to be subject to high-severity wildfires, with concomitant damage to watersheds, fish and wildlife habitat, homes and communities. Therefore, active management within a forest sustainability context is needed" (Fitzgerald, October, 2002).

Basal areas outside the 1000' treatment area would remain 100-200 square feet per acre and the identified issue statement (Halt insect damages and reduce the numbers of bark beetles) would be ignored throughout 95+% of the LCM area.

Also, thinning the entire stand can be the first step in promoting this stand to a stand with large healthy trees. "Thinning is often necessary to prevent stagnation or excessive mortality due to suppression and to create vigorous trees and stands in the absence of insects and disease." "Thinning increases the growth of leave trees and may be used to accelerate the development of stands designated to eventually have old growth characteristics" (Cochran and others, April, 1994). "Rates of growth are faster for trees that are grown out in the open with good root systems, but are generally slow for the regeneration and old tree stages in dense forest communities" ICBEMP, Draft, Volume 1, Chapter 2, page 63, 1997.

2. No Logging of Trees >12" DBH:

The first step to treating the fire hazard and insect epidemic was the firebreak effort that was completed October 26, 2002. This operation treated 70 acres along the north BLM property line. The treatment area width varied from approximately 500 feet to ¼ mile. This pre commercial thinning and fire hazard treatment was the first step in addressing the fire hazard and insect situation, which is scattered throughout the Project area.

i. Direct Effects: Physical evidence shows that insect damage has occurred in trees of all sizes within this LCM project area. Insects attack stressed trees regardless of size. The situation on LCM is somewhat unique. The IPS beetle is attacking the smaller tops of the larger diameter trees. As a result, many large trees have dead tops (upper ½ to 2/3 of crown). Since these larger trees are further stressed by their dead tops, the turpentine beetle is attacking at their bases and the western and mountain pine beetles are infecting the trees at mid bole. Within this stand it is common to find the large trees infected by up to three of the four known beetles.

Therefore, logging trees no greater than 12 inches dbh would avoid the opportunity to effectively control the insect epidemic. These many large as well as small pockets of dead and infected trees would continue to increase in size and would continue to join together to create an insect infested east/west band across the lower to mid slope of the mountain. Scattered pockets are established higher on the mountain as well as to the east and west. Eventually these pockets would join and the insect epidemic could be four fold within the next 1-2 years.

ii. Indirect Effects: Left partially treated (trees less than 12 " dbh), this LCM project area would be susceptible to higher insect mortalities and result in higher risks to slash loads, standing dead tree fuels, and catastrophic wildfires. "With high ground fuels and high tree densities, these dry forests are now much more likely to have severe fires" (PNW Science Update, page 5, September, 2002). Thinning trees less than 12' dbh would be a thin from below operation. "Only three percent of the acres receiving a Thin-from-Below treatment would still have a low fire hazard rating 30 years later" (Fiedler and Others, page v and Table 2, September, 2001).

iii. Mitigation to Reduce Impacts: Since step 1 of this LCM project is completed, step 2 needs to address the insect situation in trees >12' dbh. "Basal areas around pine trees should be kept under 100 square feet per acre on poor sites" (Attachment No. 2).

Approximately 60% of the commercial size trees within this stand are 12 inches or less dbh (Attachment No. 3). Thinning only these trees would be an ineffective treatment of the insect epidemic for this stand. Since many of the insect infested trees on LCM are the larger over story ponderosa pine trees, trees of all sizes would continue to be lost in the future. "Old Ponderosa pines, "high risk" trees (those most likely to be infested by western pine beetles)" (Attachment No. 2, page 2).

"Our evaluation of crown fire hazard following treatment shows that these small tree removal prescriptions do not achieve their stated objectives" (Fiedler & Others, page 17, September, 2001). "Stands experiencing a mountain pine beetle outbreak should be promptly harvested to avoid building an even greater population of beetles" (Blue Mountains Forest Health Project, page 11-53, April, 1991).

Therefore, a comprehensive stand treatment prescription "is clearly superior to prescriptions that focus only on removing small trees" (Fieldler & Others, conclusion - page v, September, 2001).

"While removing small trees is a necessary part of any effort to reduce hazard, this analysis clearly shows that it is not sufficient." "In addition, removing late-successional species and reducing density sufficiently to induce seral species regeneration (and enhance sustainability) commonly requires cutting some medium-sized and larger trees with commercial value". "Furthermore, the hazard reduction effects are longer lasting, with over 70% of treated stands remaining in a low hazard fire condition 30 years after treatment" (Fiedler & Others, page 17 and Table 2, September, 2001).

iv. Summary of Impacts: By treating only trees less then 12 inches dbh, target basal areas could not be attained. We would be allowing insects to do the density thinning. We would be risking losing much of the forest stand, including trees >12" dbh, to insects and possibly more or the entire stand to catastrophic wildfire. "Once an outbreak begins, beetles select the largest trees in a stand. The natural resistance of trees and stands to attack by mountain pine beetle decreases as age and competition increase" (Blue Mountains Forest Health Project, page 11-46, April, 1991).

3. No Logging on slopes >30%:

The John Day Resource Management Plan (RMP) requires aerial yarding on slopes greater than 35% (John Day RMP, ROD, p.28, 1985). Aerial yarding consists of partial or full suspension of logs off the ground. This could be accomplished by cable, helicopter, or similar yarding machinery. Since a majority of the project area contains >35% slopes, these yarding systems would be acceptable and legal methods that would minimize or eliminate the effects of yarding

Also, "utilize ground based equipment only in areas that average less than 35% slope" (LCM Memorandum, Russ Lane, page 2, #1, June 2002).

4. No Logging on unstable slopes >20%:

The LCM area has very shallow soils over a solid bedrock structure. As a result there are no known geologically unstable, erosion prone, slumping or slid areas.

5. No Logging in Riparian areas:

PACFISH buffers will apply in Whisky Gulch and in the unnamed side drainage at and below the spring in Section 7.

6. No heavy machinery that compacts soil:

Within the portion of the project area that is suitable for ground skidding machinery, low ground pressure machinery would be proposed. Ground skidding on slopes less than 35% is acceptable (John Day RMP, ROD, 1985).

7. Sub-soiling in prior compacted areas only:

No sub-soiling would be proposed. Sub-soiling is the disturbance of soil to a depth of up to three feet. Ripping is the disturbance of soil to a depth of approximately 18 inches. Since low ground pressure machinery would be required in all treatment operations, landings and tractor skid trails would be ripped, water-bared, and then seeded with an approved grass seed mixture. Seeding would be proposed in order to mitigate soil erosion on the disturbed areas.

8. Canopy closure of 60% or 45%:

The appropriate measure of stand vigor for this LCM project is basal area (a measure of wood fiber per acre). Stand vigor relates to insect propagation. Tree stems growing at more than 13 growth rings per inch result in stressed low vigor trees (Andy Eglitis, page 4). These low vigor trees are the trees that attract the beetles that are currently infecting this project area. A basal area of less than 100 square feet per acre on poor sites should be effective in reducing and controlling the insect populations (Attachment No.2, Management Section, page 2). "Heavily thinned stands are generally more vigorous and less susceptible to beetles for longer periods of time than lightly-thinned stands." "Spacing studies in second growth ponderosa pine show levels of 15 feet and wider (less than 100 square feet per acre) will provide 15-25 years of protection from mountain pine beetle" (Blue Mountains Forest Health Project, p. 11-54, April, 1991). With basal areas of less than 100, tree densities would favor a more vigorous growing condition, which should result in less than 13 growth rings per inch. For examples of the relationship between basal areas, number of trees per acre, and tree spacing, see Attachment No.4. This information is from Foresters Field Handbook, 1987.

9. Maintain old growth habitat characteristics:

There is no known accepted definition of an old growth tree. Old growth is a term related to a type of forest stand.

The most widely accepted definition of a ponderosa pine old growth forest stand is discussed in a Forest Service research paper (Beardsley & Warbington, pages 42 & 43, June, 1996). The key structural characteristics of an old growth ponderosa pine stand on a low site class (Site Index of less than 70) are a minimum stand age of 200 years, live tree diameters of 21 inches, and a minimum of 13 trees per acre. Standing dead trees and down dead trees are not listed. The Site Index for LCM is approximately 65 (See discussion in - Detailed Existing Environment / Condition on BLM Lands).

Therefore, the LCM stand does not have old growth habitat characteristics since its tree ages range from 80-140 years throughout 95% plus of the area. There are large trees present but all sampled large trees are less than 140 years in age and many are insect infested. Most trees 20 plus inches dbh are 80-120 years in age. One 42-inch dbh tree sampled was estimated to be 110 years.

In addition, if our management goal is to establish and maintain old growth stand structure, then we must manage this proposed forest stand. "A common perception in American society is that old growth forests can be perpetuated by leaving them alone – letting nature take its course without human interference. This concept has serious shortcomings in forests that evolved under the influence of fire and where preservation continues the practice of excluding fire" (Arno & Others, Conclusion, page 19, 1997).

10. Maintain watershed quality:

Water quality would be improved if the Canyon Mountain Trail Road (main access road through the project area) were surfaced with an all weather surfacing. Pit run rock surfacing should be sufficient to improve current water quality.

11. Same as 10

12. No response necessary from Forest Resource.

13. No new road construction:

This would result in more extensive skid trails. If short spur roads were not permitted, more lineal footage of ground would be disturbed. More skid trails would be required throughout the area where slopes are less than 35%. Without short spur roads to locate cable yarding landings, yarding of logs would need to cross some ridge tops which would result in ground disturbances that could have otherwise been avoided.

"Utilizing temporary spur roads could shorten skidding distances and reduce overall ground disturbance" (Russ Lane, June, 2002).

14. No logging in roadless areas:

This project area has no designated roadless area. The northwestern area of LCM has no roads. The proposed yarding method for this area would be aerial yarding by helicopter so no new roads would be proposed here.

15. Same as 14.
16. No response necessary from Forest Resource.
17. Same as 16.
18. Same as 17.
19. Same as 18.
20. Same as 19.

Alternative C: Traditional

i. Direct Effects: Thinning from below involves removing the smallest trees first and proceeding to larger trees until the target basal area is attained. Reducing these 924 acre of traditional areas to a basal area of 60-100 and the other than traditional areas (1049 acres) to a 30-50 basal area and the 10% for wildlife cover areas (223 acres) to a 100-150 basal area, by targeting thinning from below only would not address the insect epidemic as it currently exists.

The current insect dead and dying trees are trees of all size classes. Thinning from below would remove small-infected trees as well as small healthy trees while leaving the larger dead and dying trees. Thinning from below would avoid the opportunity to effectively control the insect epidemic. The larger trees would continue to die and there would be no smaller healthy trees to take their place.

The basal area of 30-50 would result in a spacing of approximately 42 feet, the 60-100 basal area would be approximately a 30 foot spacing, and the 100-150 basal area would equal approximately 20-27 foot spacing (Attachment No. 4). However, spacing could be very eratic. Trees left in this spacing would include both insect infested (dead/dying) and live trees. As these dead trees fall to the ground and other live trees become infested and fall, long term spacing would be very eratic and could range up to 100 feet plus.

"While removing small trees is a necessary part of any effort to reduce hazard, this analysis clearly shows that it is not sufficient." "In addition, removing late-successional species and reducing density sufficiently to induce seral species regeneration (and enhance sustainability) commonly requires cutting some medium-sized and larger trees with commercial value" (Fiedler and Others, conclusion, page 17, 2001). Therefore, a comprehensive stand treatment prescription "is clearly superior to prescriptions that focus only on removing small trees" (Fiedler and Others, conclusion, page v, 2001).

ii. Indirect Effects: Thinning dead/dying and healthy trees from below only would not address the current fire hazard situation (dead trees with brown and red needles). These trees are currently adding fuels to the ground by dropping needles and branches. Some of these trees have already fallen to the ground and many more will fall in the near future thus adding to the ground surface fuels. "Our evaluation of crown fire hazard following treatment shows that these small tree removal prescriptions do not achieve their stated objectives" (Fiedler and Others, page 17, 2002). "Only three percent of the acres receiving a Thin-from-Below treatment would still have a low fire hazard rating 30 years later" (Fiedler and Others, page v, Table 2, 2001).

iii. Mitigation to Reduce Impacts: When it comes to controlling this insect epidemic and controlling future slash loads, there is no known mitigation if the correction of these conditions is a thin from below of infected and healthy trees. Too many larger dead and dying trees are the primary infected trees that are housing the insect populations. Even after attaining target basal areas by thinning from below, epidemic proportions of insect infected trees will remain and continue to kill what healthy trees are present.

iv. Summary of Impacts: Since insect infested and healthy trees would be thinned from below, the current insect infestation would continue to kill the larger healthy trees, especially in the areas with a target basal area of 100-150. This threat to remaining live trees would reduce as the target basal area of 30-50 is attained since wider spacing makes insect transportation to new hosts more difficult.

Alternative D: Uniform

i. Direct Effects: Thinning the entire area from below to a target basal area of 40-60 feet would result in a spacing of approximately 38 feet which would include both live and insect infested (dead/dying) trees. This treatment would not address the insect epidemic as it currently exists. The current insect dead and dying trees are trees of all size classes. Thinning from below would remove small infected trees as well as small healthy trees while leaving the larger dead and dying trees. Thinning from below would avoid the opportunity to effectively control the insect epidemic. The larger trees would continue to die and there would be no smaller healthy trees to take their place. Trees left in this spacing would include both insect infested (dead/dying) and live trees. As these dead trees fall to the ground and other live trees become infected and fall, long term spacing would be very eratic and could range up to 100 feet plus.

ii. Indirect Effects: Same as C.ii.

iii. Mitigation to Reduce Impacts: Same as C.iii.

iv. Summary of Impacts: Since insect infested and healthy trees would be thinned from below, the current insect infestation would continue to kill some of the larger healthy trees. The threat to these remaining live trees would be reduced since the 40-60 target basal area would result in an approximate 38-foot spacing. This spacing makes insect transportation to new hosts more difficult. Since infected tree would be included in this 38-foot spacing, the spacing would widen as these infected trees fall to the ground.

v.

Alternative E: Graded

i. Direct Effects: Targeting the dead and dying insect infested trees then thinning from below would be a major first step in gaining control of the current insect epidemic. Thinning these acres would not only remove most of the dead and dying trees but thinning from below would also discourage infestation of the remaining healthy trees that exist on the site since trees would be widely spaced. "Thinning is often necessary to prevent stagnation or excessive mortality due to suppression and to create vigorous trees and stands in the absence of insects and disease" (P.H. Cochran and Others, 1994). The trees in this stand are currently stagnant, growth rates at 20-50 growth rings per inch (See Stand Exam, 2002) and visual inspection shows mortality is excessive (Andy Eglitis, 2002)

By reducing Level 1 to a 40-50 basal area, remaining tree spacing would be approximately 38 feet. Level 2 50-70 basal area would result in approximately a 34 foot spacing. Level 3 70-90 basal area would equal approximately a 29 foot spacing and Level 4 basal area of 90-100 would equal approximately a 27 foot spacing. See Attachment No. 4 for a correlation between basal area and tree spacing.

Frequency of stand treatment re-entry would correspond directly with the intensity of thinning. Thinning to a higher basal area of 90-100 would require a more frequent re-entry than thinning to a lower basal area of 40-50, since the stand would return to the excessive basal area of 100+ sooner. "Basal areas around pine trees should be kept under 100 square feet per acre on poor sites" (Attachment No.2). Therefore, a re-entry in Level 4 would be necessary within approximately 5-10 years while a re-entry in Level 1 would delay re-entry to approximately 25-35 years.

ii. Indirect Effects: Removing the dead and dying would gain a varying degree of control of the fire hazard situation that currently exists within the project area. Removing these current and future hazard fuels would reduce the potential for fire intensity in the short term. This comprehensive treatment of removing infected trees and thinning from below would reduce the potential for fire intensity and crown fires in the long term. Level 1 ponderosa pine stands would be the least likely portion of the project area to withstand a crown fire while the Level 4 Douglas fir stands would be the most likely portion of the project area to withstand a crown fire. "73 percent of acres treated with the Comprehensive prescription would still have a low fire hazard rating 30 years later" (Fiedler and Others, page v, 2001).

iii. Mitigation to Reduce Impacts: Aerial yarding 1,409 acres on slopes >35% would mitigate soil disturbance within the project area since full suspension of logs would be required. On slopes <35% tractor yarding 817 acres would be allowed (John Day RMP, 1985) and one end log suspension would be required.

In order to reduce the amount of fuels left on the site, whole tree yarding of trees and logs less than 24 inches diameter on the large end would be required. These trees and logs would be yarded, with limbs and tops attached, to a landing area where the resulting slash would be piled and later disposed of by chipping or by pile burning. Because of yarding equipment weight limitations, trees or logs larger than 24 inches diameter on the large end would be limbed and toped within the unit. This slash would be piled and burned within the project area or disposed of by broadcast burning.

No new permanent roads would be necessary for this operation. Less than ¼ mile of new temporary roads (several short spurs or existing road extensions) would be necessary for landing area placement for both tractor and cable yarding systems. No new temporary roads would be necessary for helicopter-yarded areas.

iv. Summary of Impacts: Soil disturbance would be mitigated by requiring aerial yarding on slopes >35%. Whole tree yarding would remove most of the created slash from the operation area and would move it to landing areas for disposal. Less than ¼ mile of new temporary roads would be necessary for landing area placement.

Alternative F: Strata

i. Direct Effects: Paragraph 1 = same a E.i. par.1

By reducing juniper dominated stands to a 0-40 basal area, these areas would become more conducive to ponderosa pine establishment. Since competition for moisture would be reduced when juniper is removed, sites in eastern Oregon are known to become established with ponderosa pine and an occasional Douglas fir.

By reducing the ponderosa dominated stands to a 40-60 basal area, the remaining stand would be a variable 38 feet spacing. Spacing is dependent on diameter of the trees remaining (see Attachment No.4). Reducing the mixed conifer stands to a 60-80 basal area would result in approximately a 31 feet spacing. Reducing the Douglas fir dominated stands to an 80-100 basal area would result in approximately a 28 feet spacing.

Frequency of stand treatment re-entry would correspond directly with the intensity of thinning. Thinning to a higher basal area of 80-100 would require a more frequent re-entry than thinning to a lower basal area of 40-60, since the stand would return to the excessive basal area of 100+ sooner. "Basal areas around pine trees should be kept under 100 square feet per acre on poor sites" (Attachment No. 2). Therefore, a re-entry into the Douglas fir stands would be necessary within 10-15 years while a re-entry into the ponderosa pine stands would be delayed until approximately 20-25 years.

ii. Indirect Effects: Removing the dead and dying would gain a varying degree of control of the fire hazard situation that currently exists within the project area. Removing these current and future hazard fuels would reduce the potential for fire intensity in the short term. The comprehensive treatment of removing infected trees and thinning from below would reduce the potential for fire intensity and crown fires in the long term. Ponderosa pine stand would be the most likely areas to withstand crown fires while Douglas fir stands would be the least likely portion of the project area to withstand a crown fire.

Leaving 10% of the area (250 acres) undisturbed for wildlife cover could leave some areas untreated that are currently insect infested. Populations of insects within these areas could continue to thrive and possibly spread to adjacent healthy trees. If this were the case, the insect epidemic could develop and continue to destroy the healthy trees within this project area.

iii. Mitigation to Reduce Impacts: Aerial yarding XXXX acres on slopes >35% would mitigate soil disturbance since full log suspension would be required. On slopes <35% tractor yarding XXXX acres would be permitted.

Same as E, par. 2.

Same as E, par. 3.

If the 250 acres, reserved for wildlife cover, were located in several patches within healthy non-insect infected areas, insect epidemic control could be maximized. At the same time, the long-term establishment of this cover could thrive.

iv. Summary of Impacts:

Same as E, iv. Plus…….Locate the wildlife cover patches outside of insect infested stands.

References:

1. Fiedler & Others, September 29, 2001, A Strategic Assessment Of Fire Hazard In Montana…..discounts small tree harvest only and supports long term re-entry.

2. Andy Eglitis, Entomologist, Forest Insect Concerns For Managing Eastside

Forests…..supports tree vigor as an insect deterrent.

3. P. H. Cochran and James W. Barrett, March, 1999, Growth of Ponderosa Pine Thinned to Different Stocking Levels in Central Oregon: 30-Year Results, PNW-RP-508…..supports tree vigor and large trees.

4. P.H. Cochran and James W. Barrett, July 1999, Thirty Five Year Growth of Ponderosa Pine Saplings in Response to Thinning and Understory Removal, PNW-RP-512…..supports thinning for insect control.

5. Dr. Jill L. Wilson, Entomologist, 1990, No.3, Effect of Drought on Americas Pine Forests, Extension Bulletin of the Arboretum of Flagstaff…..insect damage retards growth, both height and diameter, also, tree vigor withstands drought.

6. P. H. Cochran, Jim Geist, D.L. Clemens, Rodrick R. Clausnitzer, and David C. Powell, April, 1994, Suggested Stocking Levels for Forest Stands in NE Oregon and SE Washington, PNW-RN-513…..thinning increases tree vigor, prevents stagnation, and resists insects.

7. Debby Beardsley and Ralph Warbington, June 1996, Old Growth in NW California National Forests, PNW-RP-491…..supports old growth stand characteristics.

8. PNW Forest Resource Managers, April, 1991, Blue Mountains Forest Health Project, New Perspectives in Forest Health, USDA, FS, PNW, Malheur, Umatilla & Wallowa Whitman National Forests…..insects damage trees without regard to age or size.

9. Memorandum to Bob Vidourek, BLM, From Russ Lane, Forest Practices / Service Forester, Oregon Department of Forestry, June 12, 2002…..supports ground based skidding on slopes less than 35% and use of temporary roads to reduce ground disturbance.

10.Stephen F. Arno, Helen Y. Smith, Michael A. Crebs, February, 1997, Old Growth Ponderosa Pine and Western Larch Stand Structures: Influences of pre-1900 Fires and Fire Exclusion, USDA, FS, INT-RP-495…..disputes letting nature take its course to produce old forests.

11.USDI, BLM Manual, 5612-Ponderosa Pine, 8/14/70…..explains site index.

12.Stephen A. Fitzgerald, October, 2002, Fire In Oregon's Forests: Risks, Effects and Treatment Options, Oregon State University…..supports active management as opposed to passive management which harms forest health and damages watersheds, fish and wildlife habitat, homes, and communities.

13.PNW Research Station, Science Update, September 2002, Fire Risks in East-Side Forests…..high tree densities result in stands with high fire risk.

14.PNW Region, USDA, Forest Service, Foresters Field Handbook, 1987…..supports basal area correlation to trees per acre.

15.Craig L. Schmitt and Donald W. Scott, October, 1993, Catastrophic Stand Conditions in the Blue Mountains: Discussion, Guidelines, and Rating System, USDA, FS, PNW, BMZ-93-05…..supports immediate action to treat insect damaged forest stands

16.John Day Resource Management Plan (RMP), DEIS, ROD, August 1985…..supports managing for commercial trees species and manage to minimize losses from insects and diseases.

17.USDA, FS, USDI, BLM, May, 1997, Interior Columbia Basin Ecosystem Management Project, Eastside Draft EIS, Volume 1…..thinning promotes tree vigor (growth) and high densities slow old tree stages. Also, overstocked stands make stands susceptible to insects.

Attachments:

1. Annual / Monthly / Daily Precipitation for John Day, Oregon State OCS, orst.edu/pub_ftp/climate, 10/31/02

2. Western Pine Beetle@www.fs.fed.us/ro/rogue/swofidsc/beetles/westernpine.html

3. Stand Exam Summary – Units 1, 2, & 3

4. Comparisons of Basal Area – Trees Per Acre / Spacing by DBH Class

5. USDA, F.S., PNW Region, Timber Cruising in the Pacific Northwest, Basic Cruiser Training Workbook, May, 2002

6. Donald W. Scott and Craig L. Schmitt, July, 1993, Stand Rating System for the Blue Mountains, Stand Classification to Determine Imminence of Catastrophic Damage

7. Wildland Urban Interface Fuel Treatment Projects

8. Volumes Per Acre: by Prescription

9. Commercial Volumes and Values: by Alternative

10. Timber Values

11. Forest Resource Comparisons by Alternative

Glossary:

Basal Area (BA): The square footage of wood fiber that occupies a given space. Basal area per acre equals the sum of the basal areas of each individual tree (Attachment No.5).

Basal Area: In forests, the cross-sectional area of a tree trunk measured at breast height (4.5 feet), usually expressed in square feet per acre.

Basal Area Factor (BAF): Each tree, regardless of its actual diameter, represents a constant basal area per acre. This constant is the BAF. Each count (In) tree represents a constant square footage of basal area per acre. Commonly used BAF's are 5, 10, 20, & 40. A larger BAF results in fewer trees being counted at a given plot (Attachment No. 5).

Board Foot: A unit of wood 12 inches x 12 inches x 1 inch.

Canopy Cover: The percentage of ground covered when a polygon drawn around the extremities of the undisturbed canopy of each plot is projected on the ground and all such projections on a given area are added together.

Carrying Capacity: The number of plants that can be maintained over a specific period of time on a specified amount of land without damage to either the organisms or the habitat.

Catastrophic: A level of insect or disease-caused tree mortality and/or damage, such that resource management goals and objectives are significantly hindered and desired future conditions described in Forest Plans cannot be achieved in either the short term or the long term (Schmitt and Scott, October, 1993).

Density: The number of trees growing in a given area, usually expressed in terms of trees per acre.

Dominant: A group of plants that by their collective size, mass, or number exert a primary influence on other ecosystem components.

Ecosystem: A complete, interacting system of living organisms and the land and water that make up their environment; the home places of all living things, including humans.

Endemic Species: Plants or animals that occur naturally in a certain region and whose distribution is relatively limited to a particular locality.

Epidemic: The rapid spread, growth, and development of pathogen or insect populations that affect large numbers of host population throughout an area at the same time.

Even-aged Management: Method of forest management in which trees, usually of a single species, are maintained at about the same age and size and are harvested all at once so a new stand may grow.

Even-aged Stand: A stand of trees of approximately the same age. Silvicultural methods that generate even-aged stands include clearcutting, shelterwood, and seed tree.

Federal Land Policy and Management Act of 1976 (FLPMA): Public Law 94-579, October 21, 1976. Often referred to as the BLM's Organic Act"which provides the majority of the BLM's legislated authority, direction, policy and basic management guidance. The act passed by Congress that established policy to retain the public lands under federal ownership, to inventory and identify their resources, and to provide for multiple use and sustained yield management of public lands and resources through land use planning. This act formally recognized the mission pursued by the BLM: managing the public lands under the principles of multiple use and sustained yield.

Forest Health: The condition in which forest ecosystems sustain their complexity, diversity, resiliency, and productivity while providing for human needs and values. It is a useful way to communicate about the current condition of the forest, especially with regard to resiliency, a part of forest health that describes the ability of the ecosystem to respond to disturbances. Forest health and resiliency can be described, in part, by species composition, density, and structure.

Harvestable: Refers to a population of plants or animals that is self-sustaining and capable of producing a dependable harvest annually to meet spiritual, cultural, subsistence, and commercial needs.

Interior Ponderosa Pine Old Growth Forest – Low Site Class (less than 70 Site Index): Minimum stand age = 200 years, live tree diameters = 21 inches, number of large live trees per acre = 13. Currently there are no criteria listed for snags and down logs. Beardsley and Warbington, Table 12, page 43, June, 1996.

Mixed Stand: A stand consisting of two or more tree species.

Multiple-Use Management: The management of public lands and their various resource values so they are used in the combination that best meets the present and future needs of the American people.

Old Growth Forests: Structural characteristics of old growth definitions differ by forest type and by site class. Structural characteristics include site class, minimum stand age, live tree diameters (dbh), number of large live trees per acre, number and size of standing dead trees (snags), and number-size- length of down dead trees (logs).

Old Single-Story Forest: Refers to mature forest characterized by a single canopy layer consisting of large or old trees. Understory trees are often absent, or present in randomly spaced patches. It generally consists of widely spaced, shade-intolerant species, such as ponderosa pine and western larch, adapted to nonlethal, high frequency fire regime.

Old Multi-Story Forest: Refers to mature forest characterized by two or more canopy layers with generally large or old trees in the upper canopy. Understory trees are also usually present, as a result of a lack of frequent disturbance to the understory. It can include both shade-tolerant and shade-intolerant species, and is generally adapted to a mixed fire regime of both lethal and nonlethal fires.
Overstory: The upper canopy layer.

Pathogen: An agent such as a fungus, virus, or bacterium that causes disease.
Site Index: A number based on the total height of dominant and co-dominant trees at 100 years of age. Site indexes for ponderosa pine range from 40 to 160. Site indexes of 40 – 70 are considered low site class.

Salvage: Harvest of trees that are dead, dying, or deteriorating due to fire, wind, insect or other damage, or disease.

Selective Cutting: Cutting of inermediate-aged, mature or diseased trees in an uneven aged forest stand, either singly or in small groups. This encourages growth of younger trees and maintains an uneven-aged healthy stand.

Seral: Refers to the sequence of transitional plant communities during succession. Early-seral refers to plants that are present soon after a disturbance or at the beginning of a new successional process (such as seeding or sapling growth stages in a forest); mid-seral in a forest would refer to pole or medium saw-timber growth stages; late-or old-seral refers to plants present during a later stage of plant community succession (such as mature and old forest stages).

Shade-intolerant: Species of plants that do not grow well or die from the effects of too much shade. Generally these are fire-tolerant species.

Shade-tolerant: Species of plants that can develop and grow in the shade of other plants. Generally these are fire-intolerant species.

Site Index: A number based on the total height of dominant and co-dominant trees at 100 years of age.

Stand Structure: The mix and distribution of tree sizes, layers, and ages in a forest. Some stands are all one size (single-story), some are two-story, and some are a mix of trees of different ages and sizes (multi-story).

Sustainability: In commodity production, refers to the yield of a natural resource that can be produced continually at a given intensity of management.

Thinning: The practice of removing some of the trees in a stand to enable remaining trees to grow faster or to change the characteristics of the stand for wildlife or other purposes.

Understory: Plants growing beneath the canopy of other plants. Usually refers to grasses, forbs, low shrubs and small trees under a tree canopy.

Uneven-aged Management: Method of forest management in which trees of different species in a given stand are maintained at many ages and sizes to permit continuous natural regeneration . Selective cutting is one example of an uneven-aged management method.

Uneven-aged Stand: Stands of trees in which there are considerable differences in the ages of individual trees.

Wildland Urban Interface (WUI): Two accepted definitions are:

1. "the urban wildland interface community exists where humans and their development meet or intermix with wildland fuel."
2. "the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuel."(Attachment No. 7)

Xeric: Having very little moisture; tolerating or adapted to dry conditions.

Station number: 354291 Station name: JOHN DAY

Element : DAILY PRECIPITATION Quantity : MONTHLY SUM Units : INCHES
a = 1 day missing, b = 2 days missing, c = 3 days, ..etc..,
z = 26 or more days missing, A = Accumulations present
Long-term means based on columns; thus, the monthly row may not sum (or average) to the long-term annual value.

Maximum allowable number of missing days : 5
99.99 = missing month 999.99 = incomplete year

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL
1953	99.99	99.99	99.99	99.99	3.88	2.65	0.00	1.05	0.04	1.14	1.29	1.96	999.99
1954	0.75	0.39	0.60	1.15	1.16	1.46	0.44	0.98	0.18	0.27	1.01	0.70	9.09
1955	0.50	0.28	0.41	2.40	1.31	0.40	0.48	0.00	1.16	0.70	1.32	1.74	10.70
1956	2.78	1.59	0.46	0.60	3.54	1.85	0.56	1.14	0.00	1.78	0.36	1.21	15.87
1957	1.32	1.21	2.85	1.20	3.29	1.28	0.11	0.17	0.50	3.32	0.43	1.60	17.28
1958	1.40	1.47	1.18	2.18	1.39	2.35	0.71	0.68	0.88	0.35	0.99	1.52	15.10
1959	2.08	0.55	0.85	0.47	1.85	0.79	0.36	0.25	3.25	0.72	0.41	0.69	12.27
1960	0.61	0.98	1.20	1.17	2.49	0.19	0.58	1.17	0.48	0.53	1.60	1.06	12.06
1961	0.10	1.64	0.90	0.46	1.60	0.77	0.15	0.09	0.57	1.26	1.59	0.90	10.03
1962	1.17	0.79	0.76	1.35	2.57	0.29	0.00	0.13	0.49	2.39	2.05	1.09	13.08
1963	0.87	1.86	0.61	2.21	1.32	1.15	0.52	0.13	1.81	0.42	1.75	0.81	13.46
1964	1.65	0.19	0.54	0.98	0.15	3.79	0.49	1.01	0.32	1.08	1.69	3.10	14.99
1965	2.81	0.36	0.45	1.62	0.77	2.75	0.94	4.25	0.00	0.19	1.26	0.48	15.88
1966	1.19	0.73	0.61	0.46	0.91	1.44	0.61	0.43	1.17	0.74	2.25	1.39	11.93
1967	1.71	0.71	1.47	1.68	1.60	1.77	0.08	0.09	0.45	1.60	0.81	0.54	12.51
1968	0.96	0.81	0.31	0.63	1.14	1.18	0.00	2.60	0.25	1.48	3.82	1.56	14.74
1969	1.11	0.79	0.59	1.91	1.68	3.45	0.23	0.00	0.49	1.70	0.57	1.58	14.10
1970	2.71	0.60	1.88	0.38	1.57	1.16	0.58	0.02	1.32	1.47	1.98	0.69	14.36
1971	2.66	0.52	1.12	1.33	0.67	0.93	0.61	0.49	0.60	0.84	1.64	3.58	14.99
1972	1.28	0.50	1.83	0.91	2.24	0.52	0.28	0.42	1.07	0.47	0.51	1.09	11.12
1973	0.71	0.43	0.46	0.68	1.14	0.23	0.21	0.15	1.07	0.81	3.12	2.40	11.41
1974	0.89	0.63	1.17	1.12	0.51	0.38	0.80	0.69	0.00	0.16	0.79	1.89	9.03
1975	1.55	1.49	1.04	1.39	0.65	0.89	1.96	0.74	0.08	2.14	0.93	1.77	14.63
1976	1.32	0.56	0.80	1.95	0.54	0.76	0.29	2.77	0.74	0.60	0.55	0.19	11.07
1977	0.47	0.23	1.10	0.64	1.98	0.81	0.07	1.08	1.43	0.99	1.32	1.43	11.55
1978	0.89	0.27	0.97	3.19	1.45	1.25	0.31	1.79	1.03	0.15	1.48	1.61	14.39
1979	1.23	1.05	0.73	1.65	1.27	0.15	0.00	2.34	0.97	1.14	1.95	0.20	12.68
1980	1.02	0.94	1.03	0.25	2.77	2.71	0.33	0.16	1.56	0.62	0.74	1.55	13.68
1981	0.46	0.68	1.60	1.21	99.99	2.38	0.90	0.08	1.12	0.53	1.67	2.84	999.99
1982	1.16	0.81	1.39	0.55	0.42	2.77	1.75	0.69	2.27	1.59	0.37	99.99	999.99
1983	0.77	1.35	2.74	0.83	2.59	2.28	0.91	0.22	1.05	0.61	1.52	99.99	999.99
1984	0.54	1.15	2.80	1.79	1.53	1.97	0.69	3.38	0.66	1.53	1.63	1.29	18.96
1985	99.99	0.71	0.63	0.80	1.61	0.12	0.32	0.71	1.15	1.13	1.69	0.46	999.99
1986	0.75	2.39	0.99	0.95	1.90	0.38	0.54	0.23	1.51	0.80	1.92	0.14	12.50
1987	99.99	0.51	0.82	0.58	1.92	1.72	1.84	0.11	0.00	0.00	0.79	0.83	999.99

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1988	0.95	0.56	0.95	1.75	1.78	1.31	0.00	0.18	0.60	0.00	1.87	1.01	10.96
1989	1.07	1.10	2.38	1.05	2.95	0.97	0.16	2.39	1.12	0.44	0.35	0.32	14.30
1990	99.99	0.37	0.87	1.91	2.11	0.64	0.07	1.16	0.39	1.16	1.37	1.50	999.99
1991	0.52	0.95	1.38	99.99	4.30	2.81	0.38	0.78	0.06	1.05	99.99	0.44	999.99
1992	0.20	0.43	1.12	0.75	0.15	2.11	1.35	0.33	0.23	1.06	2.17	1.27	11.17
1993	99.99	0.33	2.21	3.09	1.48	2.09	2.06	2.67	0.14	1.17	99.99	99.99	999.99
1994	0.60	99.99	0.87	2.33	2.96	1.11	0.30	0.11	0.60	0.97	1.59	99.99	999.99
1995	.96	.48a	2.78	2.18	1.16	2.11	.29	.77	.52a	.99	2.67	2.03	16.94
1996	2.13	.86	.63	1.39	2.04	1.11	.03	.07	.44	1.45	1.84	2.83	14.82
1997	2.61	0.64a	0.48	1.72	1.02	1.39	1.25	0.09	0.90	0.75	1.17	0.82	12.84
1998	2.01	0.31a	1.16	1.08	3.49	0.73	1.04	0.01	1.26	0.81	1.55	1.20	14.65
1999	0.64	1.41b	0.40	0.00z	0.76	0.31	0.13	0.79	0.00	0.78	1.22	0.70	7.14a
2000	1.36	0.82	1.80	1.29	1.31	1.00	0.42	0.02	0.69	1.43	0.63a	0.53	11.30
2001	0.94a	0.19	0.00z	1.77a	0.00z	1.19	0.80	0.16	0.70	0.79	0.98	1.03	8.55b
2002	0.82	0.08	0.61	1.19	0.62	0.53	0.00z	0.00z	0.00z	0.00z	0.00z	0.00z	3.85f

1 mo. missing (1.5) = ~8.6
0 mo. missing = 11.3
2 mo. missing (2.5) = 11.0

Monthly Means and Extremes
John Day, OR

Period: 1971-2000

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Mean Temperature(F)													
Maximum	41.0	47.1	53.4	59.9	68.0	77.0	86.7	86.9	77.4	65.4	48.9	41.8	62.8
Minimum	21.3	24.5	28.4	32.3	38.7	44.4	48.4	47.5	40.1	33.0	27.9	22.1	34.1
Mean	31.2	35.8	40.9	46.1	53.4	60.7	67.6	67.2	58.8	49.2	38.4	32.0	48.4
Extreme Temperature(F)													
Maximum	66	73	80	91	98	103	107	106	105	95	79	66	107
Minimum	-16	-20	9	15	22	30	35	30	23	5	-9	-23	-23
Precipitation(inches)													
Monthly mean	1.14	.79	1.28	1.38	1.74	1.27	.64	.85	.78	.87	1.41	1.38	13.53
Extreme 24 hr	1.01	.57	1.00	1.00	1.52	.86	1.32	2.23	.89	.71	.91	1.07	1.89
Snowfall(inches)													
Monthly mean	5.08	3.26	2.03	.76	.03	.00	.00	.00	.00	.35	2.39	6.32	20.19
Average number of days													
Temperature													
Maximum 90 or more	.0	.0	.0	.0	1.1	4.8	14.8	15.0	5.1	.4	.0	.0	41.0
Maximum 32 or less	4.9	1.6	.1	.0	.0	.0	.0	.0	.0	.0	1.2	3.7	11.9
Minimum 32 or less	27.1	23.3	22.2	14.6	4.8	.3	.0	.0	3.4	14.3	21.5	27.1	158.8
Minimum 0 or less	1.4	.7	.0	.0	.0	.0	.0	.0	.0	.0	.3	1.1	3.7
Precipitation													
.01 inches or more	10.7	8.9	10.8	10.9	10.5	8.1	4.1	4.2	5.5	7.0	11.5	11.1	102.9
.10 inches or more	3.9	2.9	4.4	4.3	5.2	4.1	2.1	2.1	2.7	3.0	5.2	4.5	45.0
.50 inches or more	.3	.1	.3	.2	.7	.6	.3	.4	.2	.3	.3	.4	4.2
1.00 inches or more	.0	.0	.0	.0	.1	.0	.1	.1	.0	.0	.0	.0	.4
Degree Days													
Heating days @ 65 (F)	1040	812	731	547	351	155	45	44	197	478	791	1020	6226
Growing days @ 50 (F)	1	1	10	54	172	346	567	557	296	93	8	1	2104

Monthly Means and Extremes
John Day, Oregon Period: 1961-1990

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Mean Temperature (F)													
Maximum	40.4	47.0	52.7	60.0	68.8	78.2	87.9	87.2	77.6	66.1	50.1	41.8	63.1
Minimum	21.0	25.0	28.4	32.3	38.6	45.2	48.6	47.9	40.4	33.2	28.2	22.1	34.2
Mean	30.7	36.0	40.6	46.2	53.7	61.7	68.3	67.5	59.0	49.6	39.1	32.0	48.7
Extreme Temperature (F)													
Maximum	66	70	80	91	98	103	105	112	104	95	79	66	112
Minimum	-23	-20	8	13	19	25	35	31	21	5	-8	-23	-23
Precipitation (inches)													
Monthly mean	1.15	.82	1.12	1.21	1.56	1.40	.53	.95	.84	.92	1.47	1.40	13.36
Extreme 24 hour	1.01	.57	1.00	1.00	1.52	1.02	1.32	1.89	.89	.71	.84	1.07	1.89
Snowfall (inches)													
Monthly mean	6.19	3.67	3.18	1.15	.13	.00	.00	.00	.00	.32	2.52	7.06	24.30
Average number of days													
Temperature													
Maximum 90 or more	.0	.0	.0	.0	1.1	5.5	15.0	14.8	4.8	.5	.0	.0	41.4
Maximum 32 or less	5.9	1.4	.1	.0	.0	.0	.0	.0	.0	.0	1.0	4.4	13.2
Minimum 32 or less	27.3	23.9	22.8	16.2	5.5	.3	.0	.1	3.7	13.8	21.2	26.9	161.9
Minimum 0 or less	1.6	.6	.0	.0	.0	.0	.0	.0	.0	.0	.2	1.3	3.9
Precipitation													
.01 inches or more	11.1	9.0	10.4	9.5	9.7	8.5	3.3	4.7	5.4	7.2	11.4	11.8	101.1
.10 inches or more	4.1	3.0	4.1	3.8	5.0	4.4	1.6	2.5	2.8	3.2	5.3	4.9	44.3
.50 inches or more	.3	.1	.2	.3	.5	.7	.2	.4	.2	.3	.4	.4	4.1
1.00 inches or more	.0	.0	.0	.1	.1	.0	.1	.1	.0	.0	.0	.0	.5
Degree Days													
Heating days @ 65F	1063	818	758	565	361	152	41	51	208	478	776	1024	6303
Growing days @ 50F	0	1	8	49	166	355	567	544	286	92	7	1	2078

Oregon Climate Service

WESTERN PINE BEETLE (*Dendroctonus brevicomis* LeConte)

Identification: Smallest of the western *Dendroctonus* species, this black cylindrical beetle is about the size of a grain of rice (4 mm or about 1/6 in long). Egg galleries are winding and packed with frass. Larval galleries lead away from the main gallery for short distances before turning into the outer bark. Small, reddish pitch tubes (sometimes fairly obscure) are signs of successful attack. Infested trees often exhibit woodpecker feeding with only portions of the outer bark removed. Sapwood of infested trees usually shows evidence of the characteristic bluish staining caused by the fungi introduced by the attacking beetles.


pitch tubes

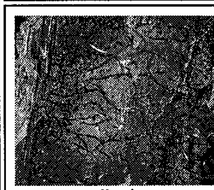
Host in Southwest Oregon: Ponderosa pine


woodpecker damage

Effects: Successful attacks result in death of the host tree. Occasionally, groups of trees are killed, especially when growing under crowded conditions. Since larger trees are often preferred, western pine beetles can dramatically alter the character of a forest that comes under attack. Effects on specific resources can include loss of timber volume, increases in fire potential, and impacts to other species dependent on large live trees. Snags created by western pine beetles can be positive from a wildlife perspective but may present safety concerns when they occur in developed recreation sites.

Ecological Role: The western pine beetle is a key mortality agent for ponderosa pines weakened by the effects of old age, drought, diseases, or competition with other trees. Stand structure can be altered and gaps can be created in the stand as the bark beetles kill large trees, either singly or in groups. In those instances where ponderosa pines occur in mixed stands with firs, western pine beetles can accelerate the successional process by selectively removing the early seral species from the stand. Trees infested by western pine beetles provide temporary food sources for woodpeckers and other insectivores. Infestation by western pine beetles sets the stage for other agents, such as wood borers and decay fungi, that are involved in the recycling of nutrients back into the soil.

Click to view larger image


galleries


galleries

Life History: In Southwest Oregon, the western pine beetle completes two generations in one year, with adult beetles flying in early June and late August. Female beetles locate a suitable host and initiate attacks by burrowing through the bark. They release pheromones that attract other beetles and lead to concentrated attacks on the host tree. These beetle-produced attractants also can lead to mass attacks on several closely associated trees in a group. Each female lays about 60 eggs in individual niches cut in the sides of the egg gallery. These eggs hatch in two weeks and young larvae feed initially in the phloem, later moving into the middle bark where most of their

Attachment No.2

development takes place. After four larval stages, the insects develop into pupae and then adults.

Conducive Habitats: Western pine beetles breed most commonly in trees of reduced vigor. While older, larger trees are generally preferred, younger trees can also be infested, especially when they occur in dense stands, are infected by pathogens, or are damaged by fire. During periods of drought, western pine beetles will be particularly prominent and can overcome healthy trees as well as obviously stressed ones. Under drought conditions in Southwest Oregon, they often infest many young pines much after the fashion of the related mountain pine beetles.


stand mortality

Management: Providing ponderosa pines with conditions that favor vigorous growth will limit detrimental effects of western pine beetles. Stand densities below the "Upper Management Zone" (Cochran 1992; Cochran et al 1994) will provide sufficient growing space for trees and will minimize potential habitat for these insects. As a rule of thumb for Southwest Oregon, basal areas around pine trees should be kept under 100 square feet per acre on poor sites, 150 square feet per acre on moderate sites, and 180 square feet per acre on good sites if limiting the risk of pine beetle infestation is a desired objective. In the past when examining large, old ponderosa pines, "high-risk" trees (those most likely to be infested by western pine beetles) were identified by various hazard rating systems (Keen 1936; Salman and Bongberg 1942). These rating systems can be used to make judgments of how western pine beetle hazard is distributed across the landscape and can also be applied to decisions regarding snag recruitment and management of stand stability.

Photos:

- galleries 1
- galleries 2
- galleries 3
- larvae in bark
- pitchtubes
- mortality
- mortality
- mortality
- woodpeckers
- woodpeckers

Reports and related publications:

Pine monitoring in Unit 6, Crabtree Timber Sale
- http://www.fs.fed.us/r6/rogue/swofidsc/crabtree.pdf

Pine Monitoring in Galice Ranger District
- http://www.fs.fed.us/r6/rogue/swofidsc/galice.pdf

I & D Conditions Highway 62
- http://www.fs.fed.us/r6/rogue/swofidsc/hwy62.pdf

References:

Cochran, P. H. 1992.
Stocking levels and underlying assumptions for uneven-aged ponderosa pine stands. USDA Forest Service Pacific Northwest Research Station Research Note PNW-RN-509. 10 p.

	Unit 1: Trees Per Acre/Total Basal Area by Species							
		TPA	**TBA**					
	cottonwood				**Juniper**			
	4	55.60	4.85		**2**	500.00	10.91	
	Doug fir				**4**	611.20	53.34	
	2	2250.00	49.09		**6**	333.60	65.50	
	4	889.20	77.60		**8**	224.14	78.24	
	6	1056.40	207.42		**10**	110.09	60.04	
	8	1350.05	471.24		**12**	101.94	80.06	
2543	**10**	733.93	400.29		**14**	93.61	100.07	
65%	**12**	458.71	360.26		**16**	14.33	20.01	
	14	580.41	620.45		**18**	33.98	60.04	
	16	387.04	540.39		**20**	18.35	40.03	
	18	169.89	300.22		**24**	6.37	20.01	
1361	**20**	110.09	240.17					
35%	**22**	60.66	160.12		**White fir**			
	24	19.11	60.04		**8**	57.34	20.01	
	26	21.71	80.06					
	32	11	60.04					
	Mahogany							
	2	3750.00	81.81				**TOTAL FOR ALL SPECIES**	
	4	1667	145.45				**TPA**	**TBA**
	6	111.20	21.83			**2**	11750.00	256.34
	8	56.00	19.41			**4**	5057.00	441.3
						6	2836.00	556.8
	Ponderosa					**8**	2817.00	983.1
	2	4500.00	98.17			**10**	1431.00	780.6
	4	12636	3188.71			**12**	1019.00	800.6
	6	1334.40	262.00			**14**	1254.00	1341
2175	**8**	1129.39	394.22			**16**	831.00	1160.8
57%	**10**	587.15	320.23			**18**	464.00	820.6
	12	458.71	360.26			**20**	266.00	580.4
	14	580.41	620.45			**22**	137.00	360.3
	16	430.04	600.43			**24**	83.00	260.2
	18	260.50	460.33			**26**	60.00	220.2
	20	137.61	300.22			**28**	47.00	200.1
	22	75.82	200.14			**30**	4.00	20
1664	**24**	57.34	180.13			**32**	29.00	160
43%	**26**	38.00	140.10			**34**	13.00	80.1
	28	46.81	200.14			**38**	3.00	20
	30	4.08	20.01					
	32	18	100.07					
	34	12.70	80.06					
	38	2.54	20.01					
		D.	F.		P.	P.		All
	TOTALS	8-12"	14" +		8-12"	14" +		8-12" 14" +
	TPA	2543	1361		2175	1664		4718 3025
		310	189		1787	875		2097 1064
		205	65		240	644		445 709
		3058	1615		4202	3183		7260 4798
		65%	35%		57%	43%		60% 40%

Attachment No.3

Unit 2: Trees Per Acre/Total Basal Area by Species

Note	Doug fir	TPA	TBA
	2	750.00	16.36
	4	750.00	16.36
	6	500.40	98.25
310	10	183.48	100.07
62%	12	127.42	100.07
	14	56.17	60.04
	16	57.34	80.06
189	18	33.98	60.04
38%	22	22.75	60.04
	24	12.74	40.03
	26	5.43	20.01

Juniper	TPA	TBA
4	111.20	9.70
8	114.68	40.03
10	73.39	40.03
12	25.48	20.01
16	14.33	20.01

Mahogany	TPA	TBA
4	55.60	4.85

Note	Ponderosa	TPA	TBA
	2	1750.00	38.18
	4	3112	271.53
	6	1668.00	327.50
1787	8	729.75	254.73
67%	10	623.84	340.24
	12	433.23	340.24
	14	262.12	280.20
	16	229.35	320.23
	18	113.26	200.14
875	20	110.09	240.17
33%	22	110.10	300.22
	26	32.57	120.09
	28	4.68	20.01
	30	8.15	40.03
	32	7	40.03
	40	4.59	40.03

TOTAL FOR ALL SPECIES

	TPA	TBA
2	2500.00	54.54
4	3695.00	322.5
6	2168.00	425.8
8	844.00	294.8
10	881.00	480.35
12	586.00	460.3
14	318.00	340.2
16	315.00	440.3
18	159.00	280.2
20	110.00	240.2
22	114.00	300.2
24	32.00	100.1
26	38.00	140.1
28	5.00	20.01
30	8.00	40.03
32	7.00	40
40	5.00	40

	Unit 3: Trees Per Acre/Total Basal Area by Species							
		TPA	**TBA**			**TPA**	**TBA**	
	Doug fir				**Juniper**			
	4	111.20	9.70		**4**	111.20	9.70	
	6	166.80	32.75		**6**	166.80	32.75	
	8	55.60	19.41		**8**	453.49	158.29	
205	**10**	73.39	40.03		**10**	146.79	80.06	
	12	76.45	60.04		**12**	152.90	120.09	
	14				**14**	93.61	100.07	
	16	28.67	40.03		**16**	71.67	100.07	
65	**18**	11	20		**18**	45.30	80.06	
	20	9	20		**20**	9.17	20.01	
	22	8	20		**22**	7.58	20.01	
	28	5	20		**24**	6.37	20.01	
	36	3	20		**26**	10.86	40.03	
					30	4.08	20.01	
	Mahogany				**36**	5.66	40.03	
	2	750.00	16.36					
	4	56	5					
	Ponderosa							
	4	56	5					
	6	222.40	43.67					
	8	57	20				**TOTAL FOR ALL SPECIES**	
240	**10**	183.48	100.07				**TPA**	**TBA**
27%	**12**					**2**	750.00	16.35
	14	37.45	40.03			**4**	334.00	29.11
	16	14	20			**6**	556.00	109.2
	18	515	224			**8**	566.00	197.7
	20	18.35	40.03			**10**	404.00	220.2
	22	8	20			**12**	229.00	180.1
644	**24**	6	20			**14**	121.00	140.1
73%	**26**	16.29	60.04			**16**	115.00	160.1
	28	9	40.03			**18**	125.00	220.2
	30	8.15	40.03			**20**	37.00	80.1
	32	3.58	20.01			**22**	23.00	60
	36	2.83	20.01			**24**	13.00	40
	40	2.29	20.01			**26**	27.00	100.1
	46	1.73	20.01			**28**	14.00	60
	52	1.36	20.01			**30**	12.00	60
						32	4.00	20
						36	11.00	80.1
						40	2.00	20
						46	2.00	20
						52	1.00	20

Average DBH	Basal Area 40	60	80	100
	Trees Per Acre / Spacing			
14"	37 / 34'	56 / 28'	75 / 24'	94 / 22'
16"	29 / 39'	43 / 32'	57 / 28'	72 / 25'
18"	* 23 / 44'	34 / 36'	45 / 31'	57 / 28'
20"	18 / 49'	28 / 39'	37 / 34'	46 / 31'
Averages:	27 / 42'	40 / 34'	54 / 29'	67 / 27'

****

Spacing Calculations:

Square feet per acre = 43,560

sq. ft. per acre / trees / acre = sq. ft. per tree

square root of (sq. ft. per tree) = spacing

General Information:

Tree Planting = 8' spacing

Pre-commercial thinning = 16' spac.

*Example:

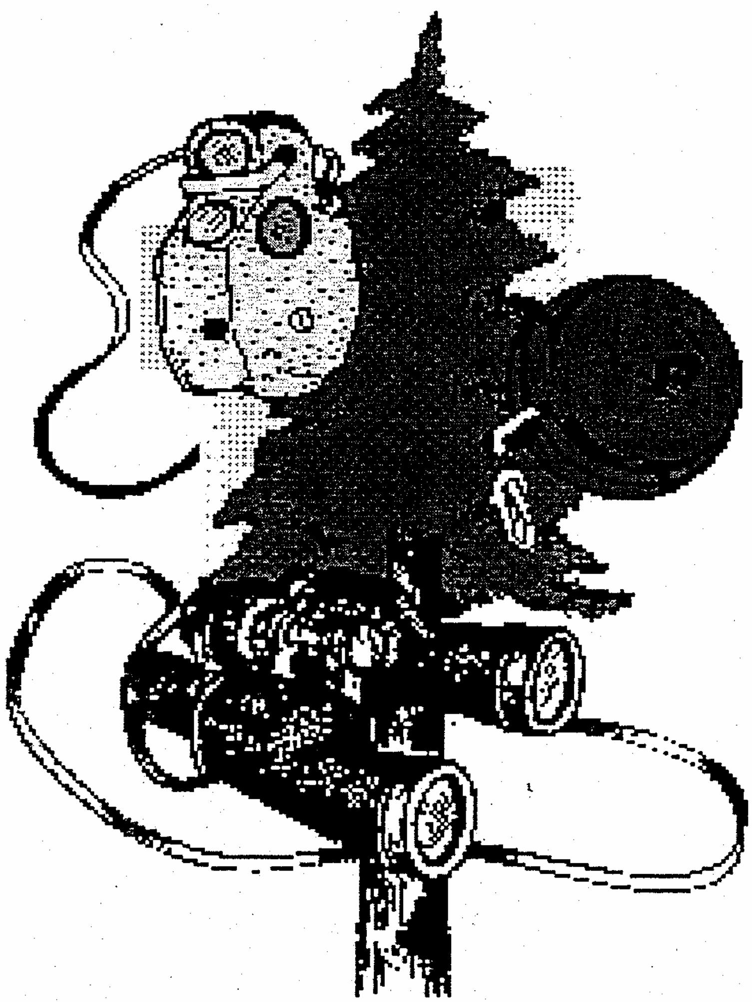
43,560 divided by 23 = 1893.91

Square root of 1893.91 = 43.5' spacing

Attachment No.4
For Analysis Purposes Only

Timber Cruising in the Pacific Northwest

Basic Cruiser Training Workbook

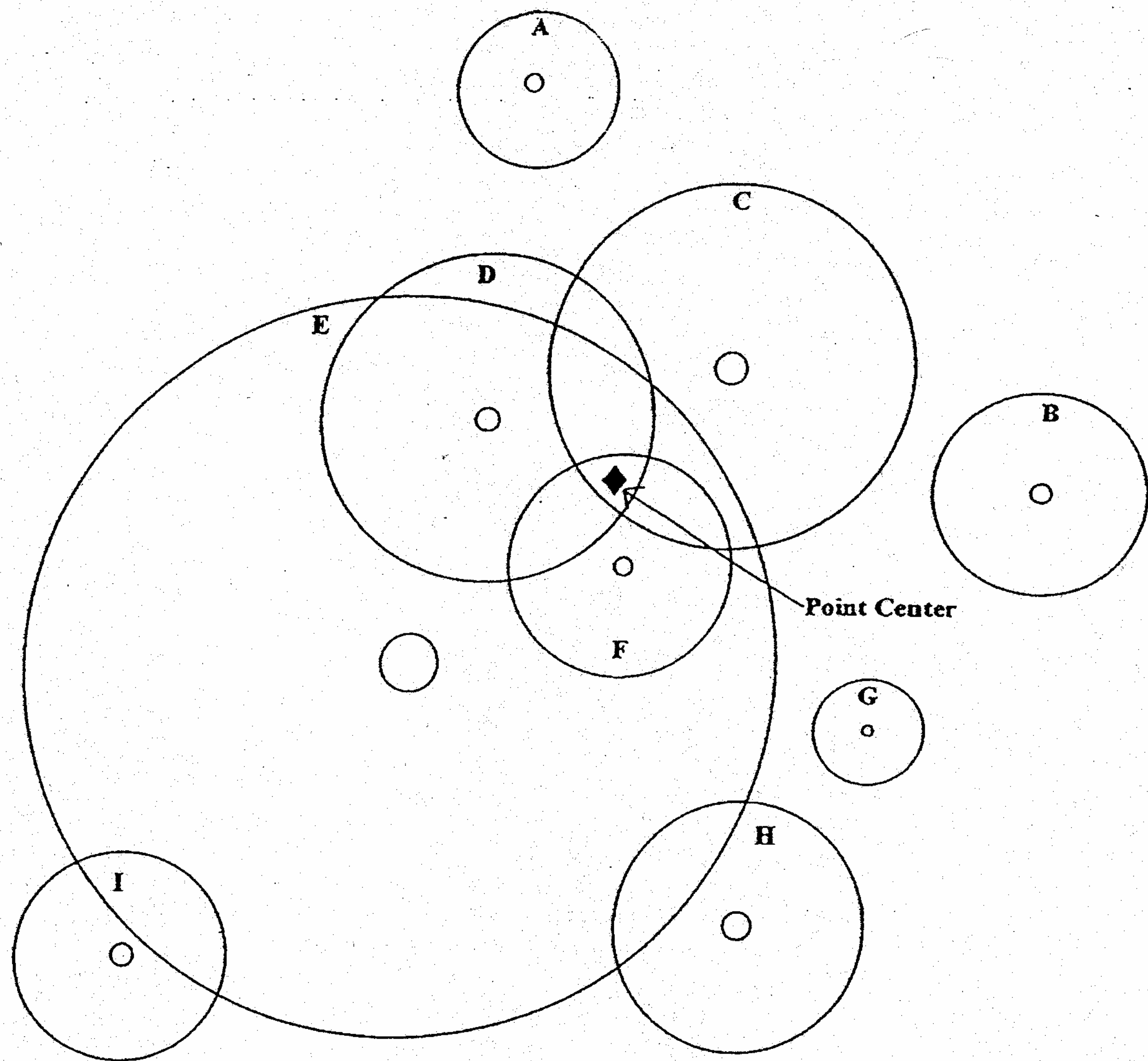


United States Department of Agriculture
Forest Service
Pacific Northwest Region
R6-NR-TM-TP-21-97

May 2002

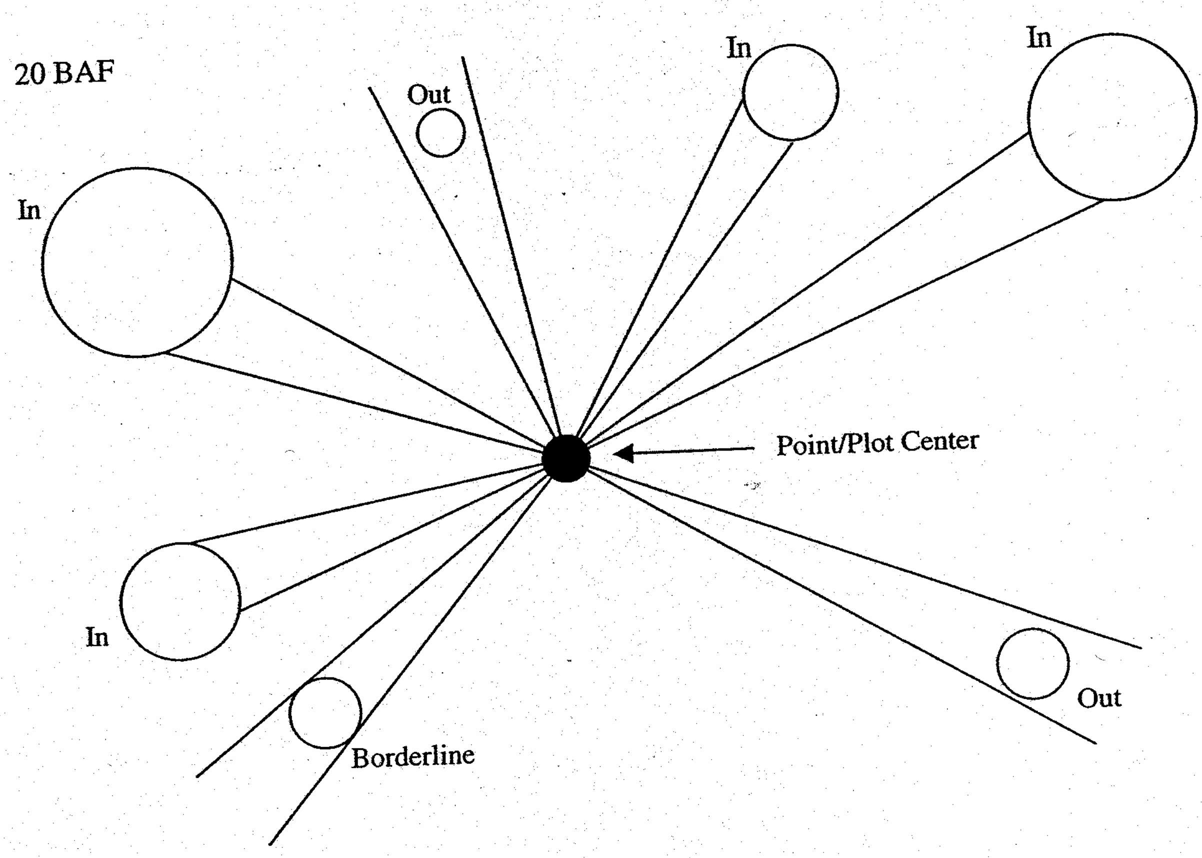
Attachment No.5

Each sample tree, regardless of its actual diameter, represents a constant basal area per acre. This constant is called the **basal area factor (BAF)** of the critical angle. Each **In** tree represents the **BAF** or a constant square foot of basal area per acre.



- Think of each tree as having its own plot around the tree itself. The **BAF** sets the trees plot size. When the point/plot center is within the "trees plot", the tree is **In**.

The higher the BAF, the larger the angle, the larger or closer to the point center the tree must be in order to be sampled. A larger BAF (larger angle) results in fewer trees being selected. A BAF is selected that gives an average of 4-8 trees per point. Commonly used BAF's are 5, 10, 20 and 40.



- Trees must be equal to or larger than the critical angle to be **In**. Using 20 BAF, 4 trees are **In**. Each **In** tree, regardless of its diameter, represents 20 sq. ft. of basal area per acre, totaling 80 sq. ft./acre.

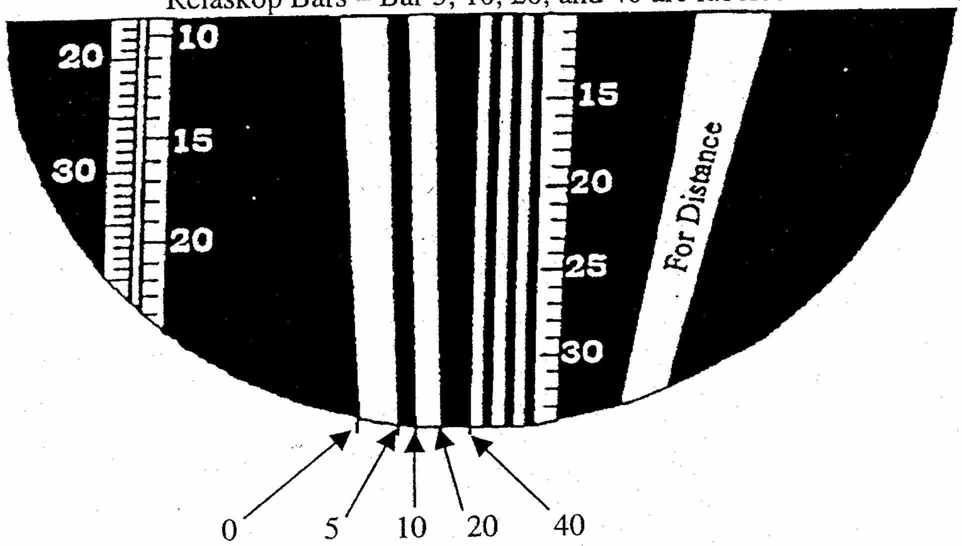
Two different BAF's can be used on the same plot as long as each set of data is input into separate strata, i.e., 10 BAF for small trees and 40 BAF for larger trees.

Borderline trees are measured to determine if they are **In** or **Out** using limiting distance. Follow step-by-step instructions on how to measure limiting distance included in this workbook.

The Spiegel Relaskop

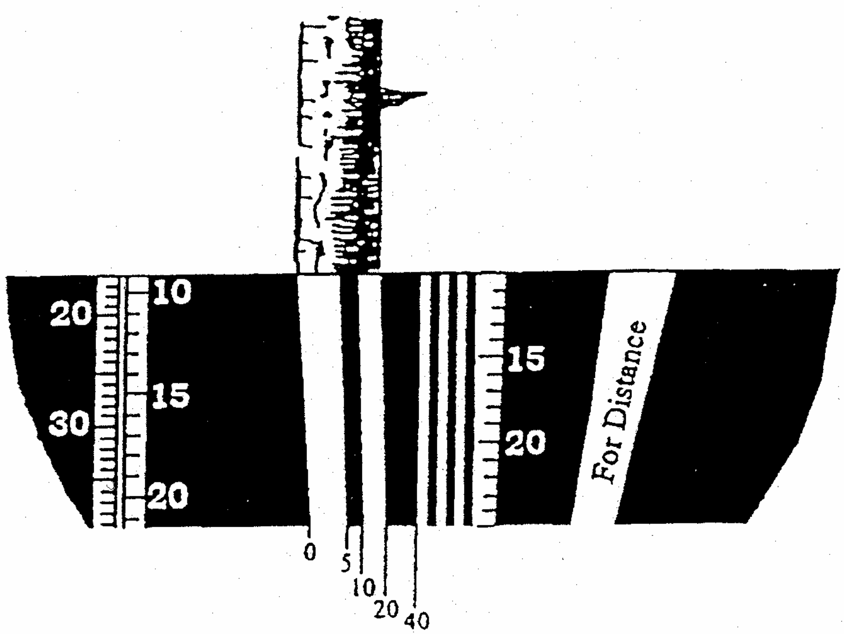
The Spiegel Relaskop is the most widely used tool for sample tree selection. Bars inside the Relaskop are used to represent different Basal Area Factors (BAF's). The Relaskop automatically **adjusts for slope** and the internal bar width varies to compensate for slope. When a tree diameter is larger than the critical angle of the Relaskop, the tree is selected for sampling.

Relaskop Bars – Bar 5, 10, 20, and 40 are labeled.



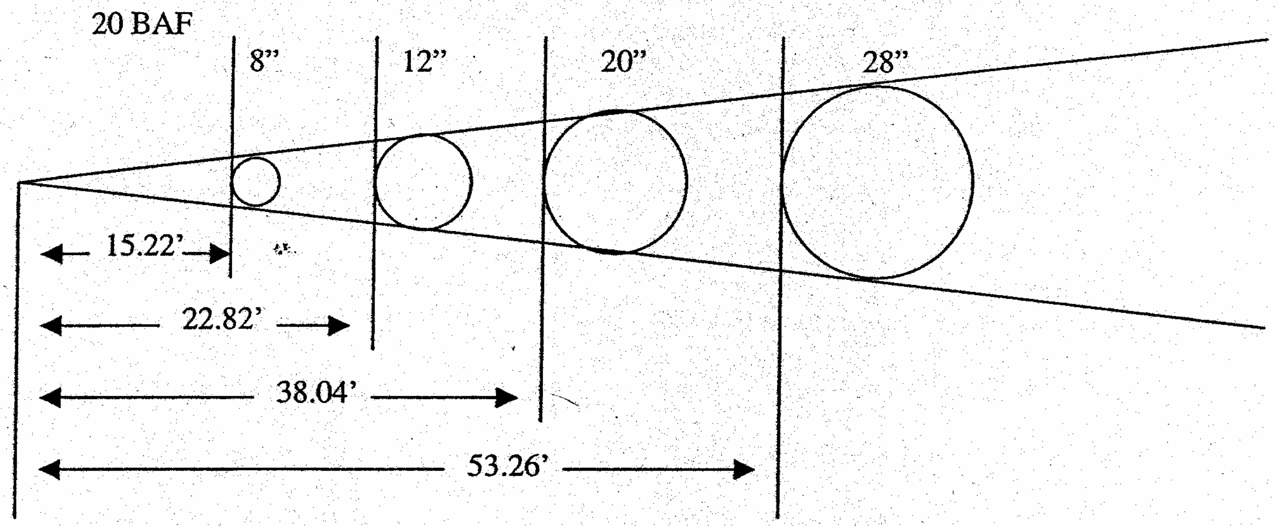
Looking through the Relaskop at DBH, the tree must be **larger** than the width of the bars for any given BAF to be considered **In**.

This tree is **In** using a 5 or 10 BAF, **borderline** using a 20 BAF, and **Out** using a 40 BAF.



Smaller trees must be closer to point center in order to be considered **In**.

Graduating tree sizes using 20 BAF



Borderline trees are measured to determine **In** or **Out** status. Borderline trees are hidden trees or trees that are not positively identified as being clearly **In** or **Out**.

LITTLE CANYON MOUNTAIN

LC

STAND RATING SYSTEM FOR THE BLUE MOUNTAINS
STAND CLASSIFICATION TO DETERMINE IMMINENCE OF CATASTROPHIC DAMAGE
(NORTHEAST OREGON AND SOUTHEAST WASHINGTON)

Donald W. Scott and Craig L. Schmitt
Blue Mountains Pest Management Zone
Wallowa-Whitman National Forest
La Grande, Oregon 97850
July, 1993

C. par. 3

Score

(1) Relative status of Forest Plan "Desired Future Condition" for management area or resource: 2

Currently meets long-term (50 years) Desired Future Condition (value = 0)

Currently meets short-term (10 years) Desired Future Condition, but will probably not meet long-term Desired Future Condition (value = 1)

Currently meets neither short-term nor long-term Desired Future Condition, nor is expected to due to current pest trends and stand conditions (value = 2)

(2) Proportion of major stand species basal area currently defective or dead, or will be within the next 10 years: 1

< 25% affected	(value = 0)
25-50% affected	(value = 1)
51-75% affected	(value = 2)
76-100% affected	(value = 3)

(3) Current stocking conditions (include all live tree species): 2

Normal stocking (75-100%)	(value = 0)
Minimum or understocked	(value = 1)
Overstocked	(value = 2)

*** Stocking may be best assessed using SDI-based density recommendations by Cochran and others (1993).*[2] **

[2] Cochran, P. H., J. M. Geist, D.W. Clemens, R. R. Clausnitzer, and D. Powell. 1993. Density Levels for Sustainable Forest Stands in Northeastern Oregon and Southeastern Washington. In Review.

Attachment No.6

(4) Relative fuels condition (size, accumulation, and structure) and potential for catastrophic stand replacement fire before the next planned management entry: 2

Currently meets "normal" range of fuels condition expected for this plant association at normal stocking (value = 0)

Current range of fuels "moderate" for this plant association; potential for increase in fuels from current or expected insect, disease, or other catastrophic event also moderate (value = 1)

Current range of fuels "high" for this plant association, or expected to be high due to insect, disease, or other catastrophic events affecting stand now, or within next ten years resulting in at least a 50% probability of a major fire event (value = 2)

(5) Relative risk of spread of insects or diseases from infested or infected overstory stand components to susceptible developing or advanced regeneration: 2

Overstory infestation/infection non-existent or very "low;" risk of spread to understory components also "low" (value = 0)

Overstory infestation/infection and risk of spread to understory "moderate" (value = 1)

Overstory infestation/infection and risk of spread to understory "high" (value = 2)

(6) Relative risk of losing present silvicultural options in stands, based on insect and disease effects, stand structure, and composition: 2

Risk non-existent or low (value = 0)
Risk moderate (value = 1)
Risk high (value = 2)

STAND COMPOSITE SCORE 11

Stand Classification Table:

Composite Score Range	Degree of Imminence	Comments
0-1	Low	Stands relatively healthy and expected to remain healthy for the next decade; expected to meet Desired Future Condition over this period.
2-5	Borderline Condition	Not catastrophic, but will approach catastrophic condition within five to ten years.
≥ 6	Catastrophic	Presently catastrophic, or will become catastrophic within three of five years.

Acknowledgments

We'd like to thank the following individuals for their prompt review and comments which have improved the quality of this document: Dave Powell, Andy Eglitis, Paul Flanagan, Suzanne Rainville, Ralph Williams, Ernie Collard, Steve Fletcher, and Max Ollieu and the FPM R-6 staff.

Wildland Urban Interface Fuel Treatment Projects

Since the development and implementation of the National Fire Plan, a marked increase in attention to fuel treatment in the wildland urban interface has occurred. However, there appears to be some confusion or differing interpretation as to the what the wildland urban interface actually is and what constitutes reportable wildland urban interface projects. The following information reinforces existing wildland urban interface definitions and clarifies valid wildland urban interface fuel treatment projects.

Definition - Wildland Urban Interface:

Wildland Urban Interface currently has two accepted definitions:

- **"the urban Wildland interface community exists where humans and their development meet or intermix with wildland fuel."**
  This definition is found in the Federal Register/Vol. 66, No. 3/Thursday, January 4, 2001/Notices; and "Fire in the West, The Wildland/Urban Interface Fire Problem" A Report for the Western States Fire Managers, September 18, 2000.

- **"the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuel."**
  This definition is found in the NWCG Glossary and the 10-Year Comprehensive Strategy Implementation Plan.

Based on the existence and use of the above-stated definitions, there is no further need to redefine or create definitions of the wildland urban interface.

Wildland Urban Interface Fuel Treatment Projects:

Valid Wildland Urban Interface Fuel Treatment Projects are designed to reduce risks to people and their community. These projects involve more than strict fuel modification, they increase the level of community risk awareness, identify values and risks, develop partnerships and collaborative mitigation strategies, and manipulate fuel complexes to alter amounts, distribution, and structure so that fire behavior inside, adjacent to, or outside the wildland urban interface will be lessened and capabilities to control wildland fire within the interface will be increased. Specific wildland urban interface fuel treatment activities can be conducted within, adjacent to, or outside the wildland urban interface. However, to meet designation as a valid and reportable WUI fuel treatment project, the sum of the activities must be clearly defendable in their support to reducing hazardous fuel levels and potential fire behavior, and risk reduction to the people and the community.

WUI projects include actions associated with mitigating wildland fire risks to people and their communities that are in the proximity of federal land. These activities include public meetings (Firewise workshops, etc) collaboration, technical assistance, preparing contracts/agreements, risk assessments, preparation of mitigation plans, clearances, NEPA, Section 7 consultation, assisting in the development of implementation strategies, hazardous fuels treatments, fire education and training. The development of community infrastructure, increasing suppression resources, or enhancing facilities is not appropriate.. Please refer to Rural Fire Assistance.

WUI Project Focus:

- Activities will focus on high-risk communities and adjacent resource values that are inherently important to the social and/or economic stability of the community.
- Projects must be focused on communities at risk published in the Federal Register and future communities identified by the local collaborative effort.
- Initial projects will focus on areas closest to the highest risk areas.

WUI projects will:

- increase wildland fire safety to the public and firefighters
- reduced risk of unwanted wildland fire to communities, including their critical elements such as resource-related jobs, communication infrastructure, transportation networks, municipal watersheds, and utilities
- reduce risk to recreational opportunities and associated wildland attributes, and cultural and historic resources and landscapes.
- strengthen rural economic sustainability and increase opportunities to diversify local economies.
- increase public education and understanding for the importance of implementing hazardous fuels risk reduction activities on both Federal and private lands.

Volumes Per Acre: by Prescription

Alternative	Breakdown	Target Basal Area	* Commercial MBF/Acre Removed
F	Juniper	0-40	0
C	Non Traditional	30-50	3
E	Graded – Level 1	40-50	3.75
D	Uniform	40-60	2
F	Ponderosa pine	40-60	3.5
E	Graded – Level 2	50-70	3
F	Mixed Conifer	60-80	2.75
C	Traditional	60-100	2.5
E	Graded – Level 3	70-90	2.25
F	Douglas fir	80-100	2
E	Graded – Level 4	90-100	2
C	Wildlife Cover	100-150	1.5
B	<12" dbh	100-190	.25

Commercial Volumes and Values: Comparisons by Alternative

Alt.	Post Treatm. BA	*2 Treated Acres	*4 Tractor Acres <35%	*4 Aerial Acres >35%	*1 Removed mbf/acre	Total MBF Volume Removed	Average dbh Removed	*3 Average $ Value per mbf	Total $ Value Removed
A Target: No Action	100-200	0	0	0	0	0	0	0	0
B BMBP Target: Less than or equal to 12" dbh	100-190	225	0	0	0.25	56	10	230	$12,880
C – Target: Thin from below only – no dead & dying									
Traditional	60-100	865 (525)	337 (205)	528 (320)	2.5	T – 513 A = 800	17	230 80	$117,990 64,000
Outside Trad.	30-50	979 (600)	382 (234)	597 (366)	3	T = 702 A – 1098	18	230 80	161,460 87,840
10% Wildlife	100-150	208 (125)	81 (49)	127 (76)	1.5	T = 74 A – 114	15	230 80	17,020 9,120
Pit Buffer	100-200	32	0	0	0	0		0	0
		2084 (1250)	800 (488)	1252 (762)		3,301			$457,430
D – Target: Thin from below only- no dead & dying									
Uniform	40-60	2091 (1255)	815 (489)	1276 (766)	2	T – 978 A = 1532 2510	14	230 80	$224,940 122,560 $347,500
E – Target: Dead & Dying then Thin from below Graded									
Level 1	40-50	999 (600)	390 (234)	609 (366)	3.75	T – 878 A = 1373	17	230 80	$201,940 109,800
Level 2	50-70	549 (330)	214 (129)	335 (201)	3	T = 387 A – 603	17	230 80	89,010 48,240
Level 3	70-90	395 (237)	154 (92)	241 (145)	2.25	T = 207 A = 326	16	230 80	47,610 26,100
Level 4	90-100	253 (151)	99 (59)	154 (92)	2	T = 118 A = 184	15	230 80	27,140 14,720
		2196 (1318)	856 (514)	1340 (804)		4076			$564,560
F – Target: Dead & Dying then Thin from below Stratified									
Juniper	0-40	352	-	-	-	-	-	-	-
Ponderosa	40-60	883 (706)	217 (174)	666 (532)	3.5	T = 609 A = 1862	18	230 80	$140,070 148,960
Mixed Conifer	60-80	315 (252)	106 (85)	209 (167)	2.75	T = 234 A = 459	16	230 80	53,820 36,720
Douglas fir	80-100	300 (240)	100 (80)	200 (160)	2	T = 160 A = 320	14	230 80	36,800 25,600
		1850 (1198)	423 (339)	1075 (859)		3644			$441,970

*1 See Attachment No. 8

*2 Estimated Harvest Acres = 60% for Alt. C, D, E (20%=Juniper & 20%= noncommercial areas)
= 80% for Alt. F (20%-noncommercial areas)

*3 See Attachment No. 10

*4 Estimated Tractor Acres = 39%, Aerial Acres = 61%

Bob V 02/14/03 Attachment No. 9

Forestry Report
12/06/02

Timber Values

Logging Costs/mbf	Malheur Lumber Co	Prairie Wood Products	Profit & Risk
Tractor	$160	$160	$40
Cable	$300	$301	$40
Helicopter	$290	$300	$50

Product Values at the Mill / mbf				Average or Camp Run
Ponderosa pine:	8-9"	$200		
	10-14"	$360		
	15-19"	$470	$470	
	20-23"	$575	$575	
	24-29"	$625	$650	$430
	30+"	$675	$750	
Douglas fir:		$400	$400	$400
White fir:		$320	$360	$340

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Attachment No. 10
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Forest Resource Comparison by Alternative

Alternative		Basal Area	Years To Re-Entry	*1 Future Tree Vigor	*2 Approximate Future Variable Spacing in feet	Remaining Tree Health
A		100-200	Undetermined	15-50	10	Extreme Insects
B		100-190	Less than 2	15-45	15	Extreme Insects
C						
	Non-T	30-50	30	5-8	42	Moderate Insects
	Trad.	60-100	10-20	10-15	29	Heavy Insects
	Wildlife	100-150	5-10	15-20	20	Heavy Insects
D		40-60	20	5-10	38	Moderate Insects
E						
	Level 1	40-50	30	7-8	40	Insect Control
	Level 2	50-70	20	8-11	34	Insect Control
	Level 3	70-90	15	11-13	29	Insect Control
	Level 4	90-100	10	13-15	28	Insect Control
F						
	Pond. P.	40-60	30	7-10	38	Insect Control
	Mix Con	60-80	20	10-12	31	Light Insects
	D. F.	80-100	10	12-15	28	Light Insects

*1 Growth Rings Per Inch

*2 Numbers Interpolated from Attachment No.4 (for planning purposes and comparisons only)

Bob V.
12/02/02

Attachment No. 11