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FORESTLAND STEWARDSHIP PLAN

Submitted by
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To

Kittitas County

For

Transfer from Designated Forest Land to Open Space Timber Tax Status
RCW 84.34

Applicant Signatures *Kathleen Anne Keeney*
B. Robert Keeney

Tax parcel, map number, Acres, and Legal Description
951509, 19-16-02000-0036 – 18.19 acres
Ptn lot A, B33/p28
AFN 200608310050

PLAN DATE: October, 2011

Prepared by
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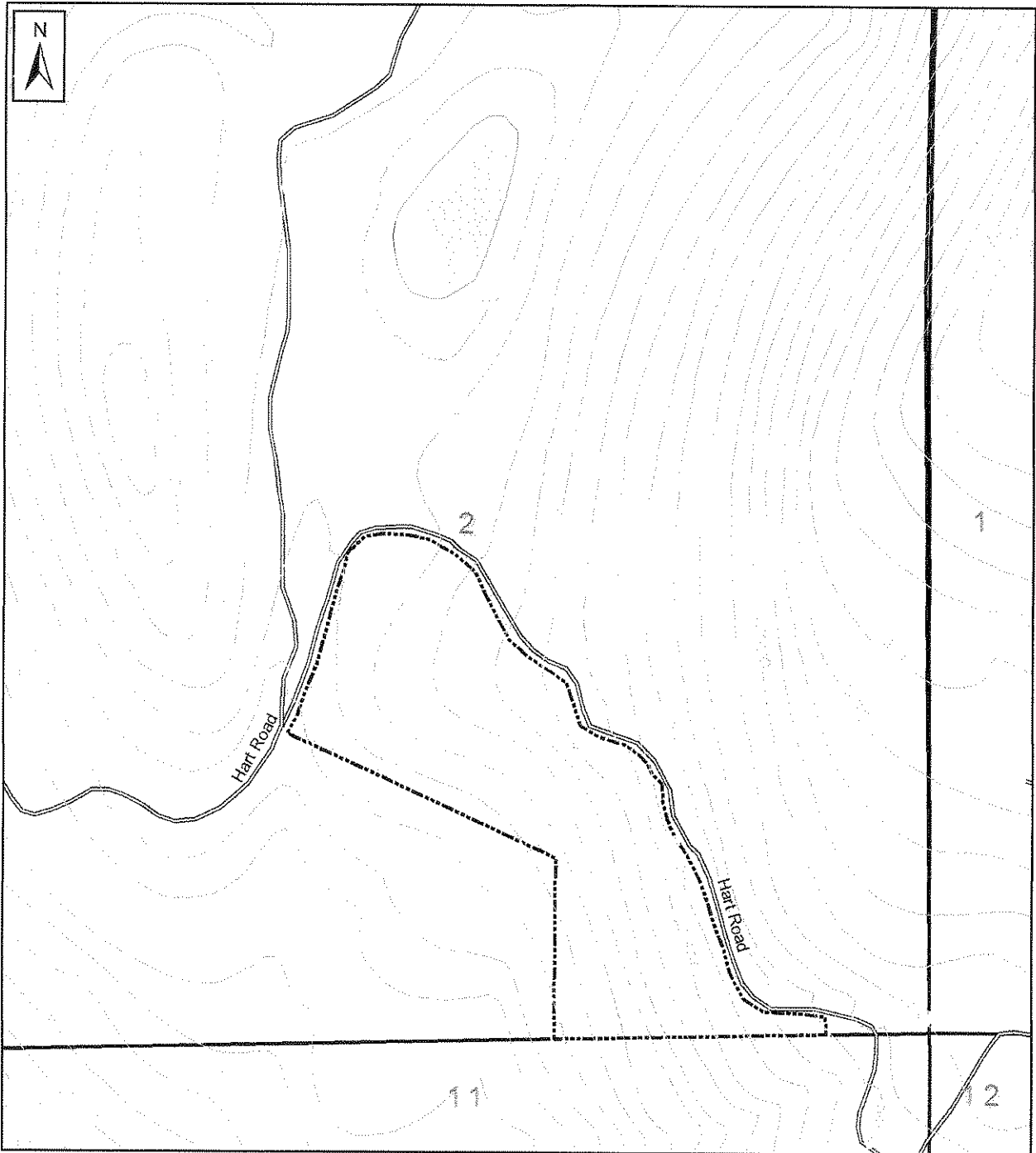
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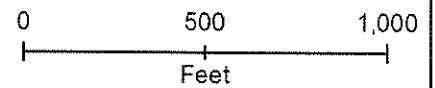
T19N, R16 E, S02, SE1/4

Forest Stewardship Plan
Keeney Family Property
Tax parcel 951509 - 18.19 acres
Open Space - timber

Nov, 2011



	Section Line	Road		Ownership Bdy
	Water Body			
	Streams			
	40' Contour Line			



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INTRODUCTION

Acquisition date: Oct., 2011

The land is in compliance with Title 76 RCW.

The land is not presently used for grazing.

This plan is being submitted together with an application for transfer from designated forest land tax status to Open Space-timber under RCW 84.34 and Kittitas County Commissioner's Resolution No. 2002-99 [94-25].

The plan includes by this reference the County Wildfire Protection Plan adopted under BOCC Resolution 2009-18 dated 2/18/09 and also by this reference includes County Code Title 12, Roads and Bridges. This plan also complies with WA Dept of Revenue *Guidelines for Timber Management Plans, June 2010*. There are improvements.

GOALS and OBJECTIVES

The owners are committing to a long term forest management plan. The goals are to:

- Growing and harvesting of timber for commercial purposes.
- Create and maintain a healthy, firesafe forest.
- Maintain and improve wildlife habitat.
- Protect soil and water resources.

And to comply with the Open Space Timber current use tax statute, Chapter RCW 84.34 and Kittitas County Commissioner's Resolution 2002-99.

The new owner has a good working knowledge of applicable forestry and related stewardship practices. They will continue to build on that knowledge through information available through WSU Extension Forestry, Washington State Department of Natural Resources, Washington Department of Fish and Wildlife, USDA Natural Resource Conservation Service, and forest land resource consultants.

Plan implementation will assure continued stewardship of all resources inherent with a forested landscape, providing significant natural resource and environmental benefits to the community.

The plan will be reviewed in 5 years and updated as necessary. The new owner is aware that RCW 84.34 provides for current use tax status for forest land that is *devoted primarily to growth and harvest of timber for commercial purposes*. The applicants confirm by their plan signature that it is their intention to comply with the statutory obligations of RCW 84.34. The applicants are aware there is a 7 year potential tax liability including interest and possible penalty if the land becomes ineligible for current use tax status under RCW 84.34.

LOCATION and LAND USE HISTORY

The property is located approximately 6 miles east of Cle Elum on the western slopes of Lookout Mountain. Access is via Hwy 970, the Lambert, Taylor and Hart roads. The Hart road is the northern and eastern property boundary. Adjacent property is all private. The traditional land use in the area has been timber production, wildlife habitat, and livestock grazing. These uses continue except for grazing. Most of the private land in the vicinity has been sold in smaller parcels for rural residential homesites. The property is delineated on the maps and aerial photo accompanying this plan.

LAND FORM, WATER, ROADS and SOILS

Property ranges from 2380 feet in the southwest corner to 2680 feet near the southeast corner. The topography is moderately steep west facing slopes with benches.

Water

There are no typed waters.

Roads

Existing access via the County road and private spur roads will meet current State forest practices requirements for timber harvest. No new roads will be required for timber harvest.

Forest Practices Applications

To harvest trees or build forest roads for timber harvest in the State of Washington a Forest Practices Application (FPA) is required. There are few exceptions. The standard FPA is good for 2 years and is renewable for successive 2 year periods. You may wish to apply for 15 year FPA now available for small forest landowners; also known as long term application (LTA). Although the 2 part application process is more paperwork, once in place it will give you the flexibility to time harvest entries with the best log markets. You may only remove up to 5 MBF per year for personal use without an FPA. All other removals require an FPA.

Soils

Soils are the basic resource. All plant growth is dependent on soil characteristics.

Forest Soils are made up of four main ingredients: *mineral particles, organic matter, water and air*. Soil *texture* refers to the make up of the mineral particle size: sand, silt, and clay. Soils that have a larger proportion of clay and silt are fine textured. A higher proportion of sand results in a coarse texture soils. Finer soils are usually more productive than coarse soils, but

don't drain as quickly, are very susceptible to *compaction*, and are more easily eroded than coarse soils. A soil made of roughly equal amounts of sand; silt and clay are referred to as loams. Loams tend to be more fertile, and have good water holding capacity. Organic matter – decaying vegetation and woody material - is an important component of a forest soil. Soils with high organic matter have better *structure* and leads to greater fertility and water holding capacity. Since plant roots (including trees) need air to breathe and water to grow, soil texture and structure are very important. More than half of the *feeder roots* of trees and other plants are in the top 6" to 8" of the soil. Soil compaction and other site disturbances reduce soil pore space for air and water and results in lower site productivity.

Forest soils support a wide range of life forms: plants and animals, including large conifer trees, large and small mammals, avian species and microorganisms. The type and quantity of such life depends on the soil parent material, soil, climate, and annual precipitation. All these elements are interrelated, and together make up the forest ecosystem.

Classifying and mapping soils provides the landowner with an important tool for judging productivity and choosing the proper cultural practices that will not damage the soil resource. Also, soil productivity classification is the basis for the *forestland grades* used by the county assessor to determine assessed value for lands designated under the forest tax and open space laws.

The soil survey map classifies 1 forest soil series: Tekison Stony Loam, 8025-8026. There is a non-forest soil Rock Talus 6855 but this is excluded from OS-t.

Tekison Stony Loam - (8025, 25-45% slopes; 8026, 45%-65% slopes) --

Tekison is a deep (60"+), well-drained soil formed from basalt with a mixture of loess and volcanic ash in the top soil. The top soil is a dark brown stony loam over a extremely cobbly clay loam. Stones are on the surface in most areas; there are no restrictive layers. Available water capacity is moderate. Site index is 79 for PP (ponderosa pine), meaning this species will potentially reach heights of 79 feet in 100 years.

The soil compaction potential is rated *medium*, meaning that heavy equipment should not be operated during wet conditions to avoid soil compaction, which will in turn impede seedling establishment and growth rate and health of established trees. Erosion potential is rated *medium* on 8025 and *high* on 8026 because of slope.

Throughout the property, existing ground cover is sufficient to protect the soil from erosion. Any fresh soil disturbances should be promptly grass seeded to prevent the soil surface from puddling and erosion, and help prevent the invasion of noxious weeds. Contact Phil Hess for the best place to acquire grass seed mixes.

The recommended seed mix is:

30% Sheep Fescue 30% Creeping Red Fescue
30% Canada Bluegrass 10% Chewings Fescue

VEGETATION RESOURCES and MANAGEMENT

The **management goals** for the property are driven by the following objectives:

- ◆ Create and maintain stands of healthy trees for commercial timber growing and harvesting.
- ◆ Forest fuels management
- ◆ Maintain and enhance wildlife habitat values
- ◆ Control Noxious Weeds

All of these objectives are inter-connected and include the essential element of managing vegetation to minimize risk of stand replacement and property damaging wildfire. Implementation of this plan will achieve a balance of forest health, forest fuel levels, silvicultural, wildlife habitat values and the other objectives. On-the-ground prescriptions can be customized for site specific vegetation conditions and to fit your use of the property.

Stewardship Principles

It is important to recognize that forest plant communities are in a continuing state of change. This change, referred to as succession, is imperceptible to occasional observation because it occurs very slowly over time. Forests that have not been "disturbed" in many years may appear to be static or permanent, but this is never the case. Disturbance is the most common agent for change – natural as in a wild fire, or human influenced as in a timber harvest. Planned for "change" can enhance habitat, reduce risk of stand replacement wild fire and lead to vegetation management goals. The idea is to work with nature to achieve a desired future condition or values.

Following are descriptions of current stand conditions and management recommendations. The plan should be periodically reviewed and updated to reflect changing conditions.

Stand History - Overview

There has been a long history of forest management activities since settlement. There is evidence of very old stumps with scars indicating logging in the early 1900's followed by intentional burning or wildfire. These logs could have been hauled to local mills in the Cle Elum area or Ellensburg or the Cascade Lumber Co. sawmill in Yakima. The most recent logging appears to be in the 1970's or early 1980's. These logs most likely went to the Boise Cascade sawmill in Yakima.

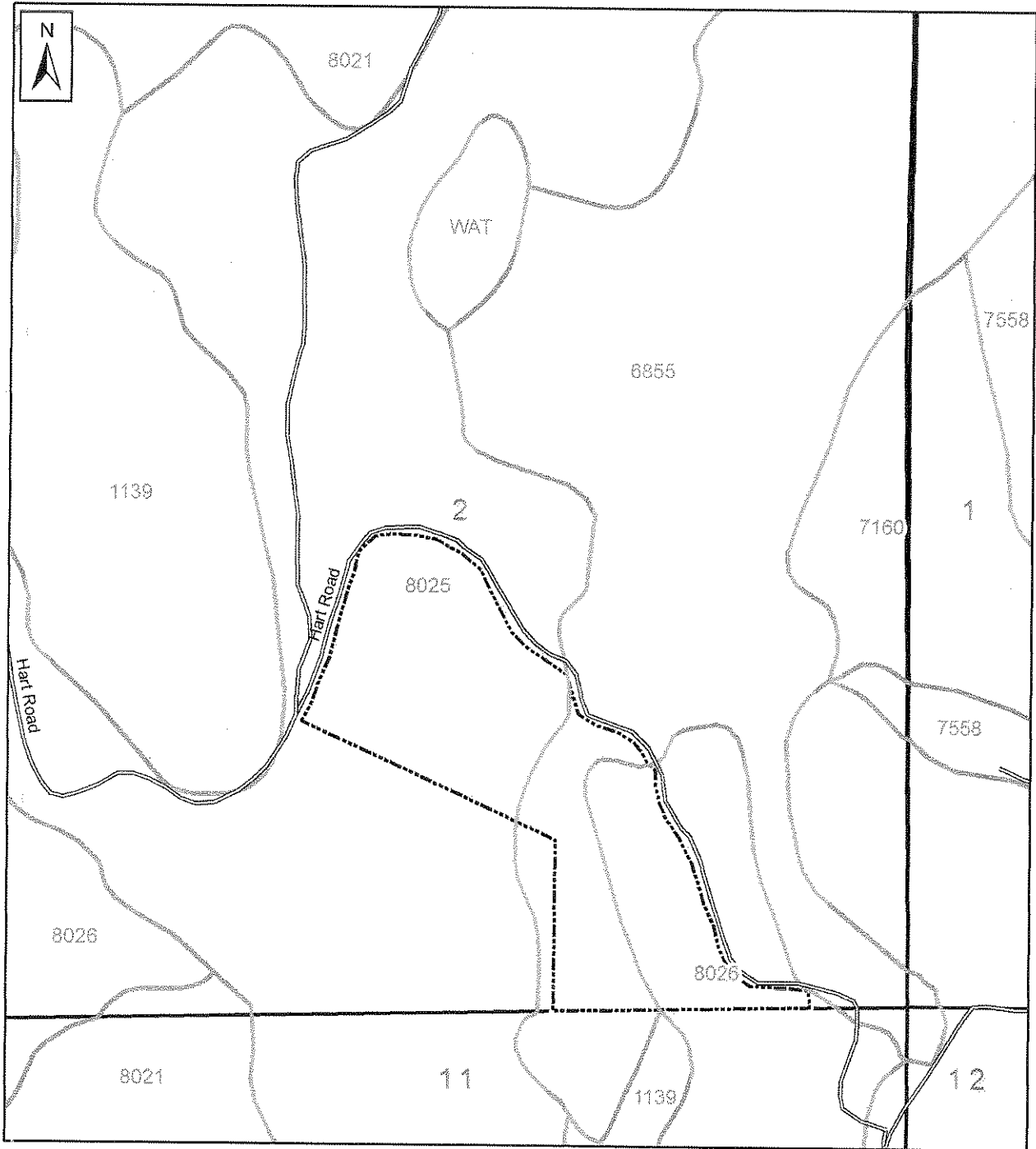
Current Conditions and Management Recommendations

Soil Type Map

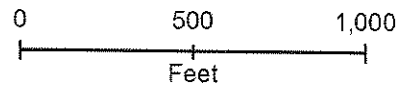
T19N, R16 E, S02, SE1/4

Forest Stewardship Plan
Keeney Family Property
Tax parcel 951509 - 18.19 acres
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	Section Line	Road	
	Ownership Boundary		RR
	Soil Type Line		Paved
			Gravel



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2009 Aerial Photo

T19N, R16 E, S02, SE1/4

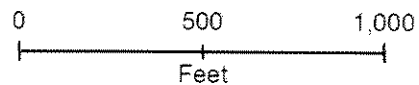
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	Section Line
	Ownership Boundary

① stands
NF = Non-Forest Area



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For current planning and management purposes there are 3 vegetation types or "timber stands" that have resulted from past management activities and natural conditions.

Management recommendations are prescriptions to improve forest health, reduce the risk of stand replacement wildfire and upgrade the forest over time.

Abbreviations used in the Stand descriptions:

DF = Douglas fir
 PP = ponderosa pine
 TPA = trees per acre
 BA/ac = basal area per acre
 SF/ac = Square feet of basal area per acre
 LCR = Live Crown Ratio (% of total tree height with live green branches)
 DBH = diameter breast height
 MBF = 1000 board feet (M = 1000 in forestry/logging)
 Reprod or regen = young trees that have naturally regenerated or planted
 WLT's = wildlife trees
 CWD = coarse woody debris
 MT = dwarf mistletoe
 RPI = rings per inch
 SBW = western spruce budworm (a DF defoliator)

Tree stocking Basics –

It is easiest to think in term of spacing between trees and/or number of trees per acre (TPA). For example:

<u>TPA</u>	<u>SPACING</u>
10	66 X 66
40	33 X 33
150	17 X 17

However, the size of the trees along with the number of trees is the correct way to determine "stocking" on any given site.

This is why we use basal area (BA) as the metric for tree stocking. Basal area is the amount of area a tree (or stand of trees) occupies in the forest.

Basal area is the square feet occupied by tree stems as measured at DBH (4.5' above the ground). Basal area is expressed in square feet of basal area per acre – BA/Ac. Approx BA/tree = $DBH^2 \times .00545$

Two separate acres can have the same basal area but a different number of trees. The tree diameter (or the average diameter of a stand) is an important variable.

For example: an 8" DBH tree is .349 SF and if the average spacing is 10'x10' then:

$$\text{Average TPA is } 435 \quad \frac{(43,560)}{10 \times 10} = 435 \text{ TPA}$$

And the average BA/acre is $435 \times .349 = 152$ SF BA/acre. The best way to determine BA/acre is with 1/10 acre or 1/20 acre circular plots. Measure DBH of all the trees in the plot and multiply by 10 (or 20) to arrive at TPA and BA/acre.

Stand 1, 3 acres – This stand is situated in the east portion of the property, down slope from the Hart road.



Stand 1 from the bottom. This is a 60- 80 year old, single layer stand, dominated by Douglas fir. Currently, tree health is acceptable, but the stand is severely overstocked for future growth and health.



Stand 1 -- slope is too steep for ground based logging system and will need to be yarded up hill to the Hart road with a portable cable yarding system.

Overview of Stand 1:

Species Mix: 70% DF, 30% PP

Average Diameter Size: 12" DBH; about 5-8 MBF/acre total volume.

Average Basal Area stocking: 200 + SF/ acre

Ave. number Trees per acre: 200 TPA

Height: 60' – 80'

Canopy closure: 60-70% with live crown ratios (LCR) ranging from 30% to 50% +.

Stand 1 Management Recommendations. –

As time goes on trees are going to decline in health and be more pre-disposed to SBW (western spruce budworm) defoliation and pine bark beetle attacks which will eventually lead to mortality. A light commercial thinning is recommended within the next 10 years to reduce stocking to less than 100 SF/acre. By reducing stocking there will be less inter-tree competition for soil moisture and the trees will be more vigorous and able to live in balance with endemic insects and diseases.

The logging can be accomplished with a portable cable yarding system from the Hart road, providing of course permission can be obtained to do this. Otherwise, trees will have to be yarded down hill to the short spur road that extends southward from the cabin site.

Ladder fuels should be pruned up on leave trees to a height of 12' to 15' to reduce the risk of a ground fire becoming a crown fire.

Stand 2, 8.19 acres. This stand is situated on the bench area in the northern portion of the parcel.



Stand 2 – At this location(north easterly from cabin) species mix is 70% DF and 30% PP. Here the dominant trees are vigorous with > 30% LCR.

Also at this location:

Average Diameter Size: 14" DBH; about 8-10 MBF/acre total volume.

Average Basal Area stocking: 150 + SF/ acre

Ave. number Trees per acre: 160 TPA

Height: 60' – 80'

Canopy closure: 60-70% with live crown ratios (LCR) ranging from 30% to 70% +.

Sample Tree #1: DF 18.7" DBH; 95' in height; 35% LCR; 10 RPI meaning trees are growing 1 inch in DBH every 5 years.



Stand 1 from the Hart road. The shrub/herbaceous layer is well established with a good diversity: Shrub species are: oceanspray, service berry, snowberry, spirea, rose, hazelnut, red stem ceanothus, Oregon grape and bitterbrush. The herbaceous layer is pinegrass, elk sedge, silvercrown luina, lupine, lomatium, balsam root, western yarrow, strawberry, helianthus, bluegrasses, wheat grasses, bromes, fescues and a variety of spring wildflowers. This species mix is typical of the shrub/herbaceous layers throughout Stand 1.

The existing stand structure and understory vegetation provides good habitat for a wide range of mammals (large and small) as well as avian species.



Stand 2 - Trees will range in size up to 22" DBH. Vigor and health will benefit from a commercial thinning within 10 years.

Overview of Stand 2 at this location:

Species Mix: 95% DF, 5% PP.

Average Diameter Size: 13" DBH; about 10 MBF/acre total volume.

Average Basal Area stocking: 240 SF/ acre

Ave. number Trees per acre: 280 TPA

Height: 70' – 90'

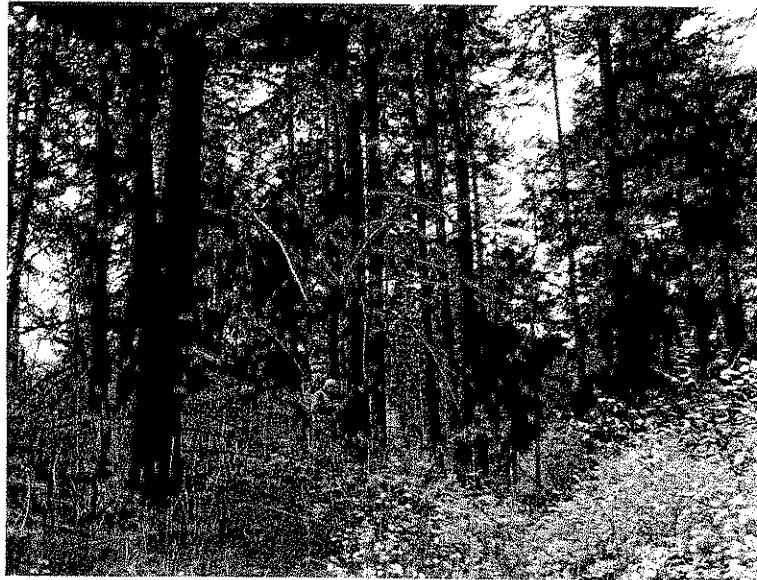
Canopy closure: 30%- 40% (up to 60-70%) with live crown ratios (LCR) ranging from 30% to 70% .

Ground fuels are excessive in places, but it is important to retain decaying wood on the forest floor for habitat diversity and long term soil health.

Sample tree #2: DF, 14.2" DBH; 80 feet in Ht; 60% LCR; growing at 16 RPI, meaning trees are growing about 1" in diameter every 8 years.

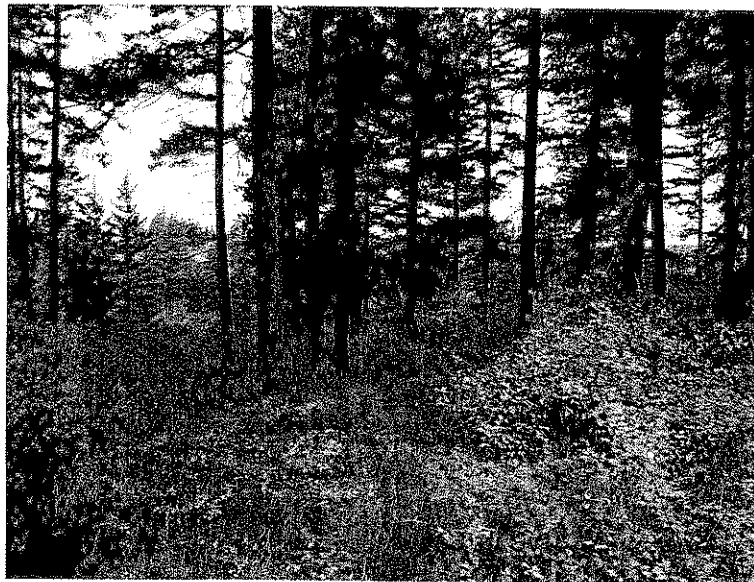
Sample tree #3: DF, 19.2" DBH; 72 feet in Ht; 70% LCR; growing at 16 RPI.

Sample Tree #4: PP, 17.0" DBH; 75' in ht; 45% LGR; now growing at 15 RPI, (was 8 RPI).



Stand 2 at

Sample tree # 5: DF 16.9"; 75' in ht; 50% LCR; 14 RPI (was 9RPI)



Stand 2 at this location:

Species Mix: 100% DF.

Average Diameter Size: 15" DBH; about 10 MBF/acre total volume.

Average Basal Area stocking: 170 SF/ acre

Ave. number Trees per acre: 60 TPA

Height: 70' – 90'

Canopy closure: 30%- 50% with live crown ratios (LCR) ranging from 30% +.

Some dwarf mistletoe: Hawksworth mistletoe rating will is mostly less than 4.

Stand 2 Management recommendations-

The stand is in fair health. Trees are beginning to show signs of moisture stress due to inter-tree competition for soil moisture. Crown spacing is too tight. Commercial thinning will benefit growth and vigor in the long term and is recommended within the next 10 years to about 80 to 100 SF/acres. Select to leave dominant and co-dominant trees with full crowns (> 30% LCR).

Pre-commercial thinning (PCT) is recommended in the overstocked patches of small trees. An FPA is not required for PCT. Prune ladder fuels to a height of 12' to 15'.

Stand 3, 7 acres. This stand is in the southwest portion of the parcel on the southwest facing slope, down slope from Stand 2.



Stand 3 - This is a wide spaced overstory of 90% PP and 10% DF. There is a cohort of old growth ponderosa pine in this overstory with trees up to 24" DBH but will average about 12" DBH. Trees are vigorous with nice full crowns, > 30% LCR. There is natural regeneration of young PP and DF trees up to 4' in height.

The shrub layer species is dominated by service berry, bitterbrush and red stem ceanothus, all three of which are preferred browse for deer and elk. The herbaceous layer is blue bunch wheatgrass, bluegrasses, Idaho fescue, western yarrow, balsam root, lomatiums, and a variety of spring wild flowers.

Stand 3 Management recommendations-

The trees in this stand are in good health and no harvest entries are recommended for about 20-30 years. Logging can be ground based down to the lower easement road.

However, it will be beneficial to prune ladder fuels to a height of 12' to 15'.

Commercial Timber Harvest considerations –

Commercial thinning has been recommended in stands 1 & 2 in order to adjust stocking levels to reduce inter-tree competition for moisture. This management practice will improve the resiliency of trees to withstand the periodic bark beetle and defoliator attacks common to our area.

Following is a guide for thinning:

Characteristics of “cut trees”:

- Poor crowns ratio (<30%)
- Poor height growth and crown form – off color.
- Mistletoe infected trees.

Characteristics of “leave trees”

- Good live crown ratio (>30%)
- Good height growth and well formed trees
- Mistletoe is absent or light.

It is recommended that commercial thinning be planned for in the next 10 to 20 years. Following are steps to prepare for this entry:

- 1) Apply for a FPA (forest practices application) well in advance of the planned for timber harvest. A LTA (long term application – 15 years) is strongly recommended. This will allow you to react to favorable log markets and any natural disturbance events that may result in imminent mortality such as bark beetles.
- 2) Clearly identify harvest unit boundaries (parcel boundaries) on the ground prior to submitting LTA.
- 3) Time harvest entry to fit favorable log markets.
- 4) Select trees to harvest (or leave) with paint marking based on the above criteria. You can use a consulting forester, DNR stewardship forester, or NRCS forester to help with this.
- 5) Prepare or acquire a sample logging contract.

- 6) Select a logger that has a good reputation and is certified with WA Contract Loggers Association.
- 7) Log marketing should be supervised by your consulting forester.
- 8) Post logging clean-up should balance forest floor fuel concerns with nutrient re-cycling. Green slash contains roughly half of a tree's above ground nutrients and can amount to the equivalent of up to 120 pounds of nitrogen per acre in addition to micronutrients and other elements such as sulfur and boron essential for tree health and growth. Do not 100% dispose of all the logging slash. If forest fuels or visual is a concern it is better to masticate the slash on site.

FOREST HEALTH

As with any forest property there are risks. Common or likely in this area are bark beetles, defoliators, root diseases, and mistletoes. Of these, dwarf mistletoe and pine bark beetles are of primary concern. Fire is a risk on any forested landscape.

It is important to recognize that insect and diseases are a natural part of a healthy forest ecosystem. In a healthy forest there is a balance between insects and pathogens and the forest trees.

It is also important to recognize that native conifers of the Pacific Northwest have the highest levels of genetic variation found in plants. Our trees exhibit large genetic differences in seedling survival, form, growth rate, and disease susceptibility. The large tree may not be the oldest. It may be a fast growing younger tree and definitely one to save. Size is more a function of rate of growth than age. So, when selecting to cut, as in thinning look at genetic characteristics such as height and fullness of crown and leave the best. The objective is to improve stand conditions for future growth and health.

Dwarf Mistletoe

Mistletoe is present in the DF in Stand 2.



Stand 2, DF mistletoe; Hawksworth rating of 4.

Basic Mistletoe Facts:

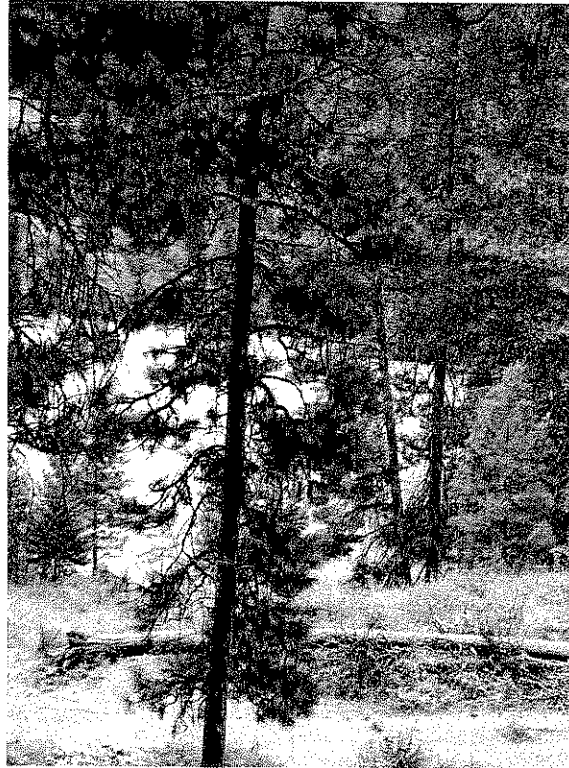
- 1) It is a parasitic plant depending on a tree host for water and nutrients.
- 2) It is specific to each species of tree. It only survives on living trees. When the tree or branch dies, so does the mistletoe.
- 3) The spread is relatively slow in single layer stands. The spread is usually downward.
- 4) Mistletoe survives by stealing water and nutrients from the tree. By itself, it is rarely a tree killer but it does weaken the tree and it will be more susceptible to bark beetle attacks in overstocked stands.
- 5) Mistletoe results in a branching deformity, but these "brooms" provide nesting and hiding cover for birds and small mammals. The "fruiting body" is a food source.

Complete eradication is impossible. The best approach is to control by cutting heavily infected trees during thinning, or pruning the mistletoe branches in the overstory and any young trees that become infected.

The Hawksworth Dwarf Mistletoe Rating System is used to assess likelihood of mortality due to mistletoe. Trees that are likely to die have a Hawksworth rating of 5 or 6. Trees with a Hawksworth rating >4 are more susceptible to bark beetle attack.

Ideally trees, with a rating >4 should be removed, the infected limbs cut off if practical or girdled if not practical to remove infected limbs.

In an individual tree, mistletoe infection is progressive. A tree with light infection will overtime develop to severe infection. Control while trees are young is by far the best approach.



This is an example of a ponderosa pine heavily infected with mistletoe on another property. This is an example of Hawksworth rating of 6 the highest. See supplemental attachment for Hawksworth details.

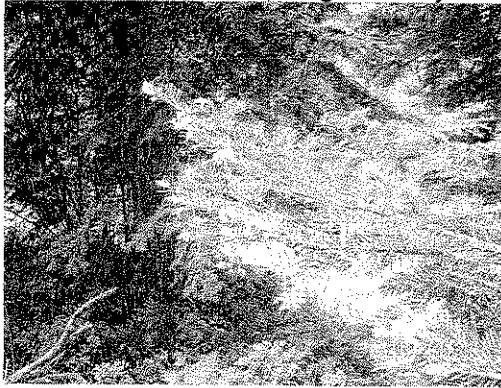
Western Spruce Budworm (will affect Douglas fir)

This defoliating caterpillar like insect has been present in Kittitas County forests since the early 1980's, and no doubt even before then and is a risk to DF and GF on this property. Population build-up run's in cycles, usually during periods of low precipitation. SBW is presently wide spread on the east slope including the Teanaway and the Swauk, but not on your property yet; likely in 2012.

Key Points –

- 1) It is a defoliating insect (eats the needles) and does not necessarily always kill the trees.
- 2) It will weaken trees and make them more vulnerable to bark beetles.
- 3) Needles will appear blighted or scorched on the tips. Needles will be bound together with webbing at branch tips.

- 4) The caterpillars are about 1" with green markings and white spots on the sides. Appear in the spring or early summer.



Current year growth SBW defoliation on GF in the Teanaway.
Manage stands to reduce impacts with proper tree spacing and species diversity.

Understanding Bark Beetles

Bark beetle populations fluctuate year-to-year depending on stress causing conditions in a stand of forest trees. The most common stress problem is available moisture. During normal precipitation years, beetle populations tend to decline because vigorous trees are better able to resist beetle attacks. During drought years, such as we have recently experienced, beetle populations tend to increase, especially in over-stocked stands. Bark beetle outbreaks can last for several years depending on weather and forest conditions. The last major outbreak was in the late 1980's and early 1990's.

Pine Bark Beetles

There is no evidence of pine bark beetle on your property but they are common in the area.

Pine Bark Beetle Facts:

- 1) Bark beetles only infest living trees or damaged and down trees that are still green.
- 2) Beetles will seek out moisture stressed trees because these trees produce less resin.
- 3) A vigorous tree can repel beetles with an abundance of resin flooding the entrance holes and galleries.
- 4) Once beetles find a suitable host tree, they release a chemical (called pheromones) to attract other beetles.
- 5) Bark beetles develop through 4 life stages: egg, larva, pupa, and adult. There is usually only one live cycle (or generation) per year.
- 6) Beetles spend almost their entire life beneath tree bark. The female will excavate an egg gallery.

- 7) The eggs hatch within a few weeks and the larvae feed on the inner bark of the tree, pupate and then emerge as an adult.
- 8) The adult beetle spends only a few days outside the bark and then will fly to locate a new host tree.
- 9) Bark beetle attacks often leave plainly visible evidence outside the bark such as pitch tubes, resin streams, and a reddish brown boring dust in bark crevices. Under the bark, distinctive egg galleries are specific to each kind of beetle.
- 10) Normal populations of bark beetles are kept in check by woodpeckers and other insect eating birds.
- 11) The green needles will begin to fade in the fall and sometimes not turn brown until the following year.
- 12) ***It is a good thing to create and maintain good bird habitat in your forest.***

There are four major groups of beetles common to Central Washington pine forests. They are native and a natural part of a forest ecosystem. They all have characteristic gallery patterns and preferred host tree types.

- 1) Mountain Pine Beetle (MPB) is generally associated with stands of ponderosa pine larger than 8" DBH in older, overstocked stands. They make long J-shaped egg galleries under the bark of trees. This is the most damaging beetle in our area. It can begin in weakened trees and even spread to healthy trees.
- 2) Western Pine Beetle (WPB) will most likely attack large, old ponderosa pine with low vigor, usually in clumps. They make winding, criss-crossing egg galleries under the bark of trees.
- 3) Pine Engraver Beetle (*Ips*) attack pine 5" to 8" DBH, logging slash, pre-commercial thinning slash, wind throw, or top portions of larger trees which have been weakened by drought. Out breaks are usually associated with spring and early summer drought. Their egg galleries radiate out from a central chamber under the bark of trees. Branches 2 to 6 inches long extend from the central chamber. Avoid creating green slash from early winter through mid-summer.
- 4) Red Turpentine Beetles attack the lower trunk of weakened or stressed pole-sized and larger pine. Look for conspicuous globular reddish pitch masses about 1 inch across on the lower trunk. The egg galleries are irregular shaped; can be up to 1" wide and about 12" long. These beetles are rarely lethal by themselves but they will weaken the tree and make it more susceptible to MPB or WPB attacks.

Understanding Root Diseases

Fading, weak crowns in DF and GF are possibly an indication of the presence of root disease, but this condition can also be the result of stress by extreme exposure to sun and wind. DF that have grown in stands of trees, often times show stress when the stand is opened up.

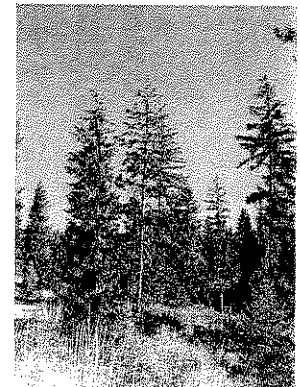
Research has confirmed that root disease organisms are native and a natural part of a healthy forest ecosystem. In a healthy forest there is a balance between the fungus and trees. The trees and the fungus have evolved with each other and pre-settlement periodic low intensity fires they lived in balance with each other.

There are 3 primary root rot fungi in the area: *Armellaria*, Laminated and Annosus, with the first two being most common. Root rot pockets are easy to identify in the forest. There will be patches of dead trees, some broken off or fallen with the root wad exposed. Often there will be a heavy patch of vine maple, oceanspray, hazelnut or alder which have responded to more sunlight reaching the forest floor.

Selective harvest will aggravate the spread of root rots because fresh stumps are quickly colonized by the fungus. The roots of these stumps in contact of roots of adjacent green trees allows the fungus to spread to these green trees and they will be dead within a year or two. In other words a "flush" of infection and mortality usually follows colonization of stumps created by selective harvesting infected trees. In any event, it is safe to say the fungus once present on a site will always be present. Normally, the fungus spreads very slowly from infected trees to adjacent trees. This may take years.

In areas that have been clear-cut and planted it is common to see pockets of dead young trees or just an individual dead tree. This is an indication the fungus is surviving in old stumps.

Host species vary in their susceptibility but all coniferous species are moderately too highly susceptible until they are 12 to 15 years old. After this age, some species become less susceptible to mortality, especially pines and western larch. Choosing to manage for pine is logical management option. If you notice infected trees, keep in mind the pocket could be $\frac{1}{4}$ acre and up to 2 acres in size. Cutting what appear to be infected trees will only aggravate the spread of the fungus to adjacent healthy trees, *unless* you cut all the susceptible trees in the pocket (GF and DF) and leave the pine. In this case, it will be ok to leave any dominant DF that have well formed, full crowns.



If you observe trees with weak or fading crowns, then it is likely because of root disease. There are exceptions: In some cases, DF that have grown in stands of trees, often times show stress when the stand is opened up.

If you are unsure of a tree health problem, contact your forester.

FIRE PROTECTION and FIRE-WISE

Fire is an inherent risk on any natural landscape. Kittitas County is a "FireWise" community, which is a program emphasizing practices designed to minimize the risk of fire to structures in the forest-urban interface.

The County has completed a Community Wildfire Protection Plan (CWPP) for the entire County, [BOCC Resolution 2009-18 dated 2/18/09] *.

A Local, neighborhood CWPP should be a high priority for the Hart Road area; these plans are usually initiated through local landowner coalitions (or core groups) and involve the local Fire District, and DNR.

Participation in a CWPP is strongly recommended. The program will reduce (but not eliminate) the risk of a property damaging wildfire and assure the property is in compliance with the County's "Defensible Space" formula.

In the event structures are planned for, you should incorporate a written defensible space plan in the site plan and in any event, prior to site preparation and building permit.

*Note: * This is available on the Kittitas County CDS website. I recommend you download and become familiar with this document, prior to the public hearing on your OS-t application.*

Defensible space – Is recommended adjacent to the cabin site

Defensible space is the area between a structure and an oncoming wildfire where the vegetation has been modified to reduce wildfire threat and provide firefighters an opportunity to defend the house. Live, low-growing, native vegetation is permissible in the landscaping but in a fashion that does not create a fire risk to the structure. Immediately adjacent to the buildings and decks there should be a 2 to 3 feet border of landscape gravel.

The herbaceous layer can include native pinegrass/elk sedge and low growing forbs. If these species are absent then seeding to the recommended grass mix is advisable. If water is available, keeping the grasses green is ideal. Low shrubs such as Oregon grape, kinnikinnick, snowberry, and spirea can be maintained. Medium to high shrubs can be present toward the outer edges if spaced with 3 to 4 feet between crowns. Native conifer trees are permitted so long as there is 10 to 15 feet between crowns, limbs do not overhang the roof (10-foot minimum), and lower limbs are pruned to a height of 12 to 15 feet to eliminate ladder fuels. Both ponderosa pine and Douglas fir are acceptable so long as they meet the criteria.

The size of defensible space will vary depending on the type and amount of vegetation and topography. For this property, **a minimum of 50 –**

75 feet is recommended. Firewood and any other flammable material should be at least 30' from the house and other buildings during the summer.

Outward from the defensible space vegetation management can be feathered into the more natural appearing forest. Consideration is given to forest fuels, wildlife habitat features, and visual attractiveness including visual screening where desirable. It is wise to thin trees and prune (or prune only) to reduce the risk of a ground fire becoming a crown fire. This prescription is referred to as a *shaded fuel break* and can apply to the entire parcel or just the portions of highest risk to the improvements. Specifics of pruning are discussed below.

This property is in a moderate to high fire risk situation because of the south slope, dry summer conditions and the increasing level of human activity in the neighborhood.

Pruning

Pruning is desirable when trees are 8' (or more) tall or are about 6" in diameter at the ground. Use loppers or a hand pruning saw to remove lower branches (limbs) close to the ground. This eliminates "ladder fuels", which reduces the risk of a ground fire traveling up limbs to become a crown fire, and is referred to as a "shaded fuel break". Always leave at least 1/3 of the live crown. Cut branches just outside the crown collar – the swell where limbs grow away from the trunk – to encourage faster healing. Be careful not to damage the crown collar or bark of the tree. As pruned trees grow in height, an additional pruning or "lift" may be appropriate. Re-evaluate pruning needs within 5 years. Pruning every tree in a patch or stand is not necessary . . . diversity is good.

The combination of thinning for proper spacing and pruning will enhance forest health and reduce the risk of stand replacement wildfire.

There is a vast source of information on FireWise landscaping. Go to www.firewise.org for good information and links and you may always contact your forester for specific on site advice. Call Phil Hess: 509-952-0678.

NOXIOUS WEEDS

Knapweed is common in the area but is not noticeable on your property.

The acceptable herbicide prescription recommended by the County Weed Board is available on their website. This treatment is effective in our area when applied at the knapweed rosette stage in May-June. Localized infestations can be treated with a regular garden type weed sprayer using the recommended herbicide at the right stage of development.

WILDLIFE HABITAT

The shrub/herbaceous layer is well established and is providing good diversity of habitat for a wide range of wildlife species and birds. The shrub species present favored by both deer and elk include the red stem ceanothus, service berry and bitter brush. Your property, on the south west flank of Lookout Mtn appears to be a migration route for deer and elk.

Another important wildlife habitat category are snags and coarse woody debris (pieces or patches of logs and large branches on the ground). Snags include both dead standing trees and those live trees with high levels of decadence or defect. Both hard and soft snags and down woody material in various stages of decay are important. Nearly all life forms in the forest begin with decaying wood.

In this area there are over 60 species of birds and small mammals that are dependent on snags for some or all of their life requisites and an equal number of species dependent on coarse woody debris. A cavity is excavated in a recently dead tree by woodpeckers, or "primary excavators". These cavities are later used by a maximum of 27 bird and 18 mammal species, who are "secondary cavity users" because they can't excavate a cavity. Birds help control forest insects that may be detrimental to tree health.



This is an example of PP wildlife trees (snag) in Stand 2. Woodpeckers will create cavities in search of insects. These cavities are then used by a large group of secondary cavity nesters.

Save your Wildlife Trees! *"Birds Eat Bugs"*



The decaying wood process provides habitat for many species of fungi, moss, lichens, invertebrates, reptiles, and amphibians that form an integral part of a healthy forest. Nearly all life forms in the forest begin with decaying wood. The decaying wood provides microsites for beneficial mychorrizal fungi and a long term, time release source of humus, organic matter, phosphates and nitrogen all desirable for healthy tree growth. Also, decaying wood acts as a reservoir for water storage by slowly releasing moisture throughout the summer.

This example is in Stand 2.

SUPPLEMENTAL INFORMATION ATTACHMENTS

Dept of Revenue Guidelines for Timber Management Plans
Kittitas County Noxious List - *Applicant orig only*
Hawksworth Dwarf Mistletoe Rating System

If you have any questions or comments, please contact the plan preparer
Phil Hess, Consulting Forester 509-952-0678
Email: hessphil@msn.com

Guidelines for Timber Management Plans

JUNE 2010

Washington's Timber Land and Designated Forest Land classifications reduce taxable land values for landowners whose lands are "primarily used for growing and harvesting timber." These designations allow the land to be valued on forest use rather than the land's highest and best use.

A Timber Management Plan is required when applying for Timber Land (chapter 84.34 RCW) and may be required when applying for Designated Forest Land (chapter 84.33 RCW). A Timber Management Plan describes timber harvesting and associated activities.



Timber Land

The Timber Land classification requires a Timber Management Plan. The Timber Land classification requires a minimum of five (5) contiguous acres that are devoted primarily to the growing and harvesting of timber. It does not include a residential home site. Timber Land includes land used for incidental uses that are compatible with the growing and harvesting of timber, but no more than 10% of the land may be used for such incidental uses. Application for classification or reclassification of land as Timber Land is made to the county legislative authority where the land is located.

Designated Forest Land

Application for Designated Forest Land (DFL) may require a Timber Management Plan depending on the county requirements. DFL requires a minimum of twenty (20) contiguous acres that are devoted primarily to the growing and harvesting of timber. It does not include a residential home site. DFL includes land used for incidental uses that are compatible with the growing and harvesting of timber, but no more than 10% of the land may be used for such incidental uses. Application for DFL must be made at the assessor's office in the county where the land is located.

How to Apply

To apply for Timber Land or Designated Forestland classification, complete one of the following forms:

- Application for Classification or Reclassification as Open Space Land or Timber Land for Current Use Assessment
- Application for Designated Forest Land

These forms are available at the county assessor's office or on the Department of Revenue's website at dor.wa.gov.

Note: Reduced Timber Land or Designated Forest Land valuation remains in effect as long as the land continues to be used primarily for growing and harvesting timber.

Timber Management Plan

A Timber Management Plan should be prepared by a professional forester. A Timber Management Plan must include the following:

1. The legal description of the land, including the assessor's parcel number.
2. The date (or dates) of the land acquisition, a statement that the land has the same ownership, consists of contiguous acreage, and is primarily devoted and used to grow and harvest timber.
3. A brief description of the timber (major species, size, age and condition).

4. If the timber has been harvested describe the plans for reforestation. If the land has no trees presently growing on it, describe the plans to restock within 3 years of designation.
5. A description of past and present livestock grazing on the land.
6. A description of whether the land is in compliance with the stocking requirements including the number of trees per acre, planned forest management activities (thinning, harvest, brush control), fire protection efforts, insect and disease control, and weed control and forest debris abatement provisions of the Washington Forest Practices Act Title 76 RCW.
7. A statement indicating whether the land is subject to forest fire protection assessments pursuant to RCW 76.04.610.

Additional recommended information for a Timber Management Plan:

- a. **Goals** – describe the ownership goals for the land and provide an outline of the intended management of the land.
- b. **Forest types and stands** – provide an inventory of the timber by forest type including stocking levels and forest health conditions.
- c. **Resource inventory and environmental impact considerations** – describe the types and species of plants and animals, predominant habitats, wetlands, any endangered species, and aesthetic resources present on the land.

- d. A map or aerial photo showing the property lines, access roads, topography, water or other physical features of the property.
- e. A statement acknowledging that the owner is aware of the potential tax liability involved when the land ceases to be classified as Timber Land or Designated Forest Land.

Generally, an approved Forest Stewardship Plan as part of the Washington Department of Natural Resources (DNR) Forest Stewardship Program will meet the requirements for a Timber Management Plan.

Sources of Assistance

Washington Department of Natural Resources (DNR)

DNR Small Forest Landowner Office

The Small Forest Landowner Office serves as a resource and focal point for small forest landowners' (less than 5,000 acres) concerns and policies. The Office offers information on the Forestry Riparian Easement Program, Family Forest Fish Passage Program and technical and stewardship assistance for Timber management via the Stewardship Program.

Contact information

PO Box 47012
Olympia, WA 98504-7012
Phone: (360) 902-1400
Fax: (360) 902-1428
sflo@dnr.wa.gov or visit
www.dnr.wa.gov

Washington State University Extension (WSU)

WSU Extension offers workshops on writing timber management plans, as well as other forest owner workshops and field days throughout the year. For upcoming events and detailed forest management information and resources, please visit <http://ext.wsu.edu/forestry/stewardship.htm/> or contact your local Extension office.

Washington State Department of Revenue

Forest Tax Section (DOR)

DOR provides help to the counties by reviewing Timber Management Plans, and offers assistance on forestland grading, compensating tax, and other aspects of designating forest land or timber land.

For more information, visit the Department's website www.foresttax.dor.wa.gov or call 1-800-548-8829.



To inquire about the availability of this publication in an alternate format for the visually impaired, please call (360) 705-6715.

Teletype (TTY) users please call 1-800-451-7985.

Appendix 1: Field method to assess likelihood of mortality due to dwarf mistletoe.

Hawksworth Dwarf Mistletoe Rating System (Hawksworth 1977):

1. Divide the live crown into thirds, and rate each third using the following scale:
 - 0 No visible infection
 - 1 < 50% of the total branches infected
 - 2 \geq 50% of the total branches infected
2. Sum the three individual ratings to obtain a total mistletoe class (0 to 6) for the tree.

Example: A conifer tree has no infection in the top third of crown, light infection in the middle third, and has many brooms in the lower third. The total score is $0 + 1 + 2 = 3$. The Hawksworth Dwarf Mistletoe rating for the tree is "3".

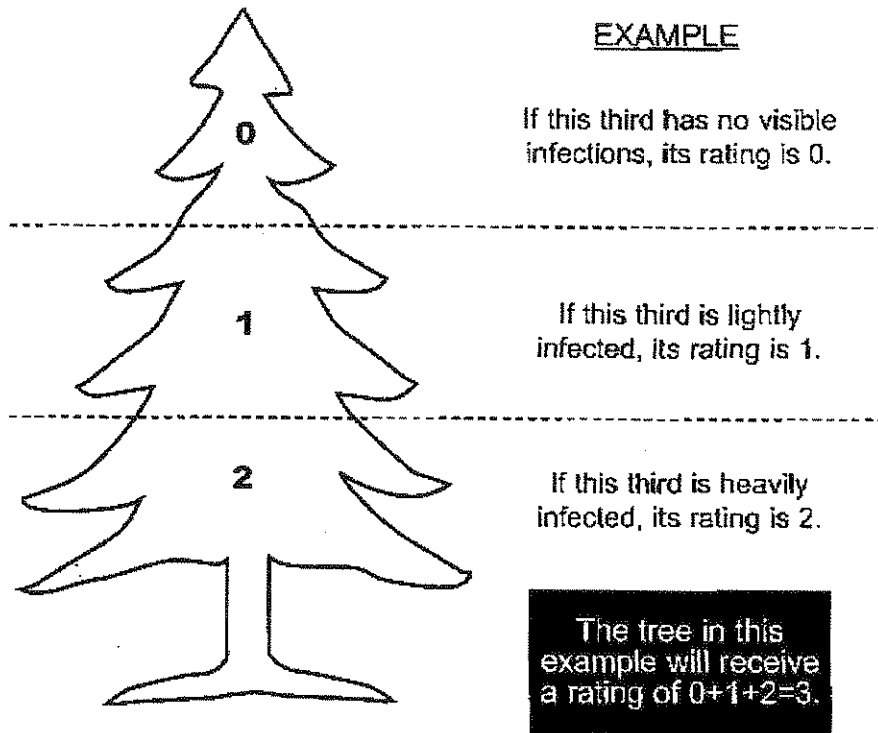


Figure from Goheen and Willhite (2006).