Boc

FOREST LAND STEWARDSHIP PLAN

Submitted by
Bruce and Kim Coe
3942 Hidden Valley Road
Cle Elum, WA 98922
To
Kittitas County
For
Application for Open Space Timber Tax Status
RCW 84.34

Applicant Signatures B Coe, Kim M. Coe

Tax parcel, Acres, and Legal Description

Tx Parcel	Parcel Acres	Owner of Record	Legal Description	OS-t Acres	OS-OS Acres
16565	6.01	Swauk Pines, LLc	Lot 4C, B26/p44-45	3.00	3.01
16564	3.42	Swauk Pines, LLc	Lot 3C, B26/p44-45	3.42	--
953887	2.16	Swauk Pines, LLc	Ptn Lot 5D, B31/p194	2.16	--
16563	3.25	Swauk Pines, LLc	Lot 2C, B26/p44-45	3.25	--
953886	2.10	Swauk Pines, LLc	Ptn 5D, B31/p194	2.10	--
14083	9.6	Swauk Pines, LLc	Lot 1A, survey B26/p44-45, AFN 200194110027, Except that portion of Lot 1A lying within the NE1/4 of Sec. 32-20-17	9.60	--
445635	35.46	Coehorts, LLC	Parcel B3, survey B24/p15. AFN 199902120037 known as NWSW, Tx 1, less Tx 2 and road Acres In Sec. 33, T20N, R17E	13.53	21.93
14084	4.83	Bruce Coe, etux	That Portion of Lot B2, B24/p15, AFN 199902120037, lying within SE1/4 of Sec. 32-20-17	4.83	--
038636	16.88	Bruce Coe, etux	That portion of lot B2, B24/p15, AFN 199902120037 Lying within SW1/4 Sec. 33-20-17	8.20	8.68
Total Open Space-timber acres				**50.09**	

PLAN DATE: October, 2011

Prepared by
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Coe Family, Swauk Pines, LLC
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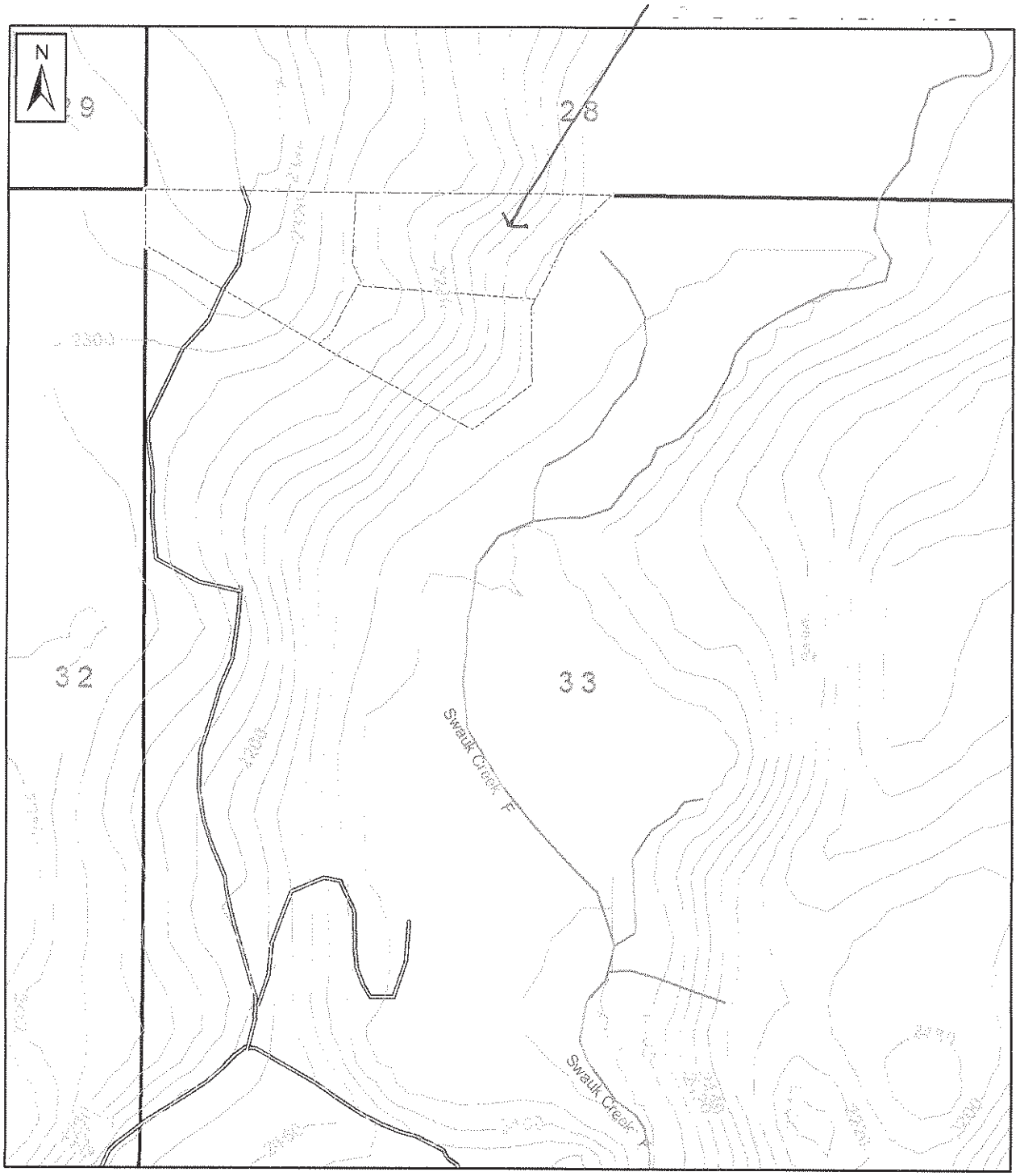
16565,16564,953887,16563,953886
Oct, 2011



Section Line
Stream
40' Contour Line

Road
Gravel
Paved

Ownership Bdy

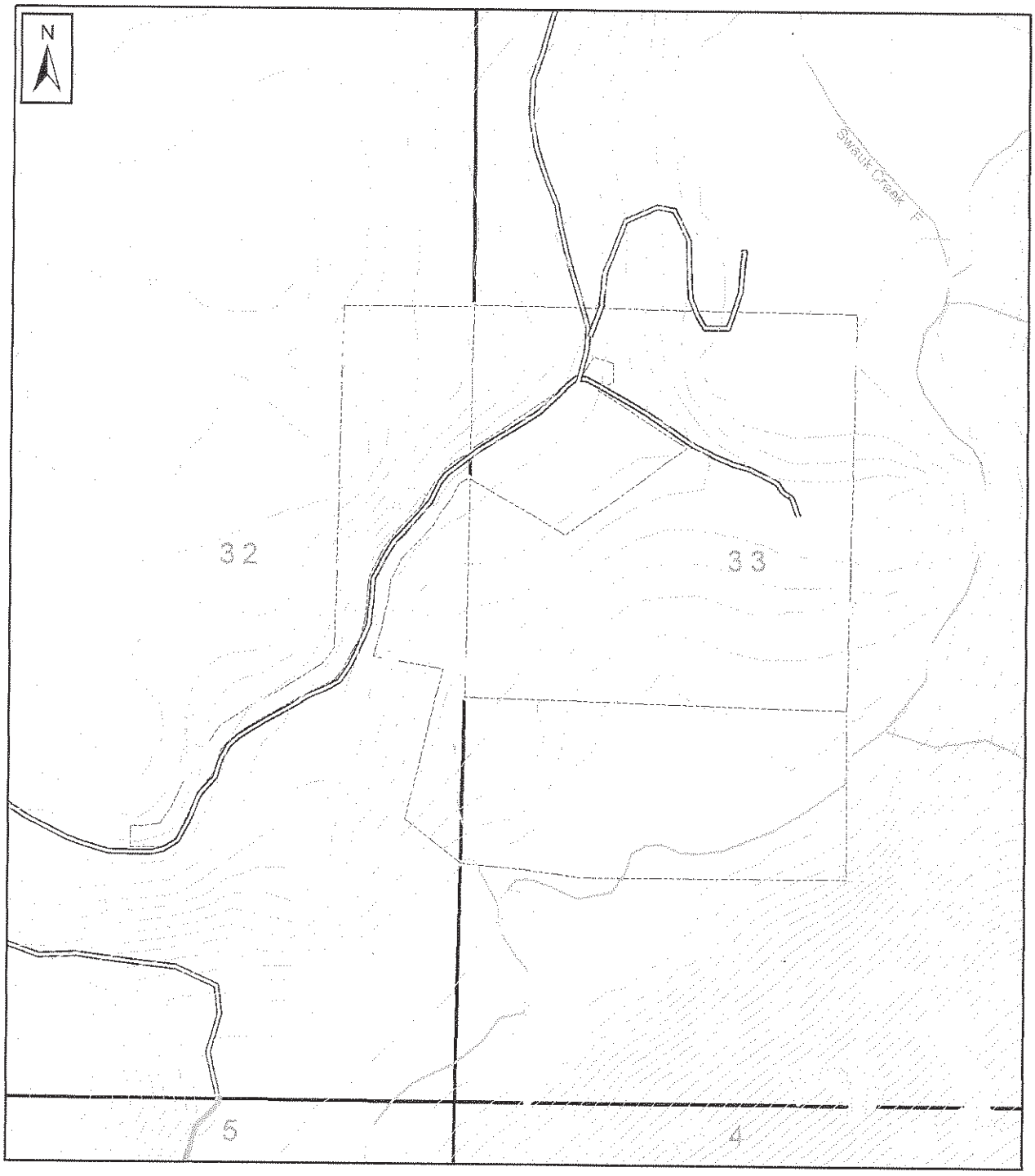
0 500 1,000
Feet

Phil Hess F&LS

Topographic Map

T20N, R17 E, Sec 33 - SW4

Coe Family
Swauk Pines, LLC & Cohorts, LLC
Open Space – timber
Tax parcels: 445635, 14083, 14084, 038636
Oct. 2011



Section Line
Stream
20' Contour Line
Road
Gravel
Paved
Ownership Bdy

0 500 1,000
Feet

Phil Hess F&LS

INTRODUCTION

Acquisition date: 5/1968
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 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 1010.* There are no improvements.

GOALS and OBJECTIVES

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

- Growing and harvesting of timber.
- Create and maintain a healthy, firesafe forest.
- Provide 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 owners have 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 owners are 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 11 miles east of Cle Elum via Hwy 970, the Hidden Valley County road and a private road system. The traditional land use in the area has been timber production, wildlife habitat, farming and ranching and forested watersheds. These uses continue but 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 2040 feet in the southern portions to 2320 feet near the northern property boundary. The topography is flat benches to gentle northerly and easterly facing slopes.

Water

There are no typed waters on any of the OS-t forest parcels.

Roads

Existing access via the County road and private roads. No new roads will be required for timber harvest.

Native surface roads will meet current State forest practices requirements for timber harvest. This road is in Stand 4, (tax parcel 14084).

Forest Practices Applications

Remember, 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. 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 breath 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 3 forest soil series: Teanaway loam, 8020-21; 7559, Stemilt Loam; and 9614, Yakima Variant loam

Teanaway Loam - (8020, 0-15% slopes; 8021, 25%-50% slopes) --

This is the dominant soil on the property. Teanaway is a deep (60"+), well-drained soil formed from loamy glacial drift and old alluvium with a volcanic ash in the top soil. The top soil is a loam over a clay loam; there are no restrictive layers. Available water capacity is high. Site index is 85 for PP (ponderosa pine) and 90 for DF (Douglas fir), meaning these species will potentially reach heights of 85 feet and 90 feet respectively in 100 years.

The soil compaction potential is rated *high,* 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 *low* on 8020 and *medium to high* on 8021 because of slope.

Stemilt Loam- (7559, 25%-45% slopes) --

Stemilt is a deep (60"+), well-drained soil formed from basalt and sandstone with a mixture of loess and volcanic ash in the top soil. The top soil is a loam over a very cobbly clay loam; there are no restrictive layers. Available water capacity is moderate. Site index is 73 for PP (ponderosa pine) and 88 for DF (Douglas fir), meaning these species will potentially reach these heights respectively in 100 years.

The soil compaction potential is rated *medium,* meaning that heavy equipment operation should be limited 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.*

Yakima Variant Loam- (9614, 0-5% slopes) --

This is also a deep (60"+), well-drained soil formed from mixed alluvium on stream terraces. The top soil is a loam over a gravelly loam; Sand and gravel form a restrictive layer over about 26". Available water capacity is moderate. Site index is 106 for PP (ponderosa pine) and is not rated for other species. The soil compaction potential is rated *medium,* meaning that heavy equipment operation should be limited 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 *low.*

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

Soil Type Map

T20N, R17 E, S33, NW1/4

Coe Family, Swauk Pines, LLC
Open Space-timber --- 13.93 acres
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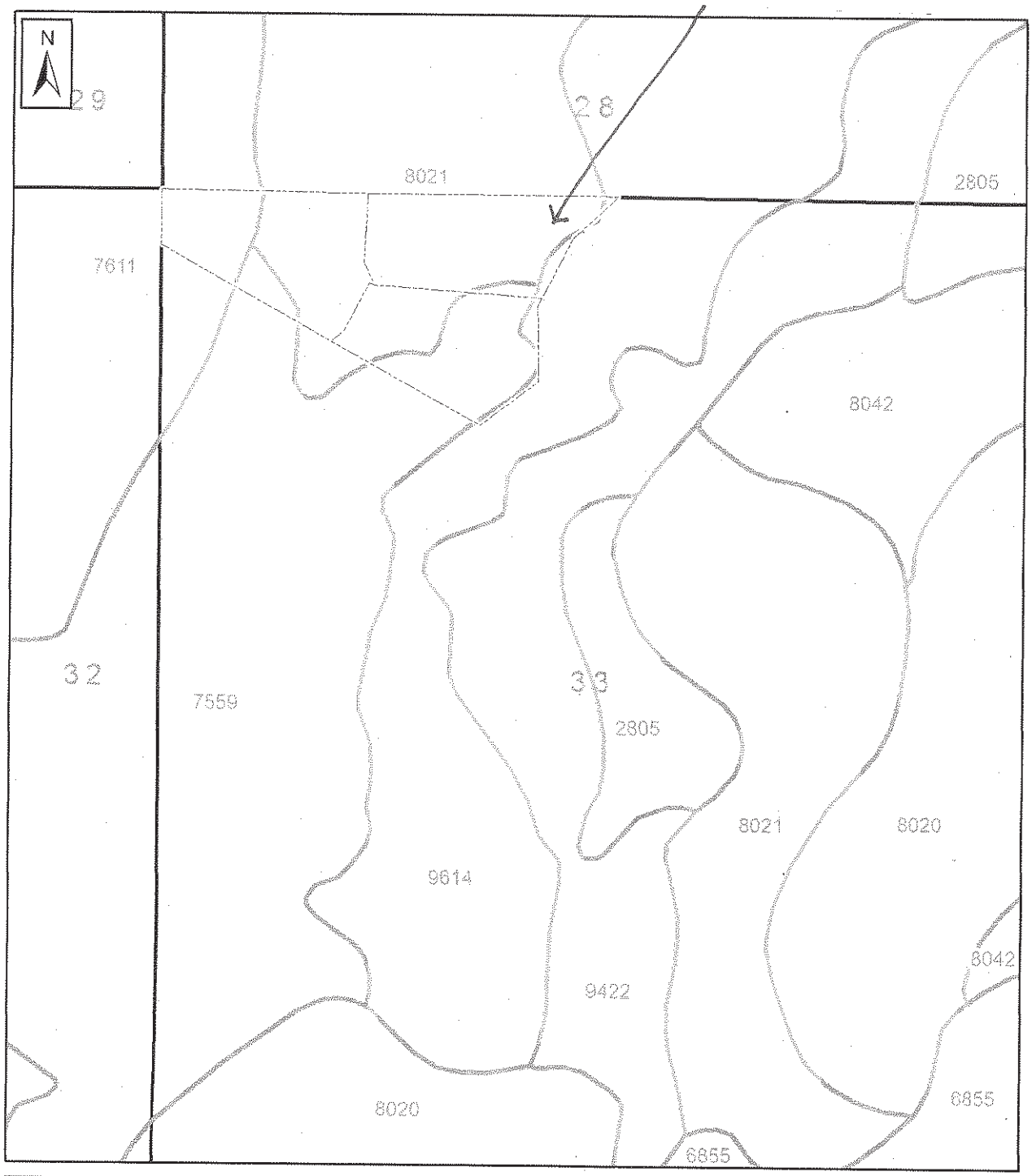


Section Line
Ownership Boundary
Soil Type Line

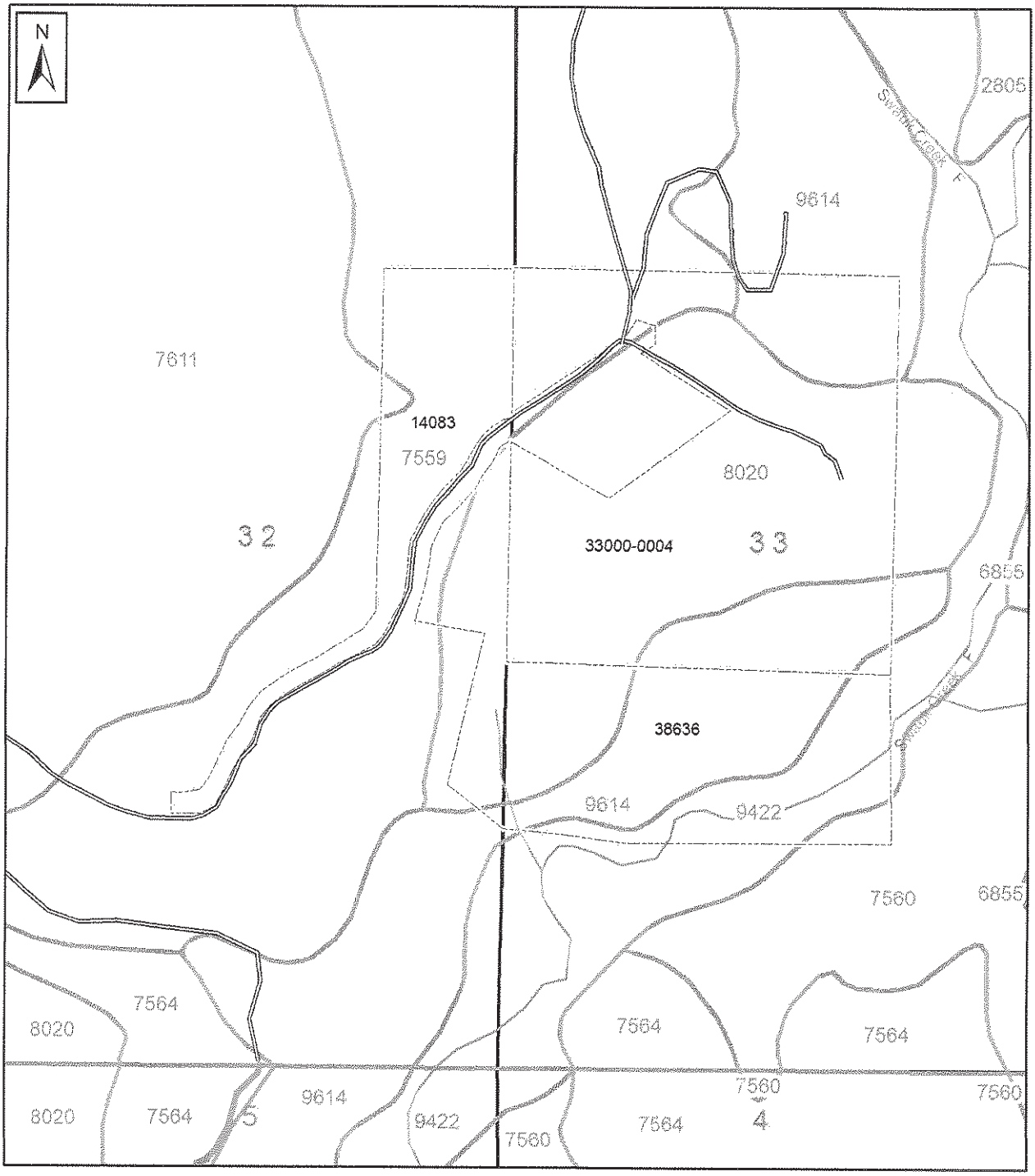
0 500 1,000
Feet

Phil Hess F&LS

Soil Types Map

T20N, R17 E, SW4 33

Coe Family
Swauk Pines, LLC & Cohorts, LLC
Open Space – timber
Tax parcels: 445635, 14083, 14084, 038636
Oct. 2011



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Paved

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Feet

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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. The Cascade Lumber Company logging railroad was active in the Swauk during the 1930's and '40's during which time most of the tributary timber stands were logged down to the rail line. This would have included all of the Coe family property. There is evidence of more recent logging in the northern most tax parcels (Stand 1), about 20 years ago.

Current Conditions and Management Recommendations

For current planning and management purposes there are 5 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. If, in the future you decide to remove marketable trees, a Forest Practices Application (FPA) is required by the State DNR..

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

Tree stocking Basics –

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

TPA	SPACING
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:

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

And the average BA/acre is 435 x .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.

2009 Aerial Photo

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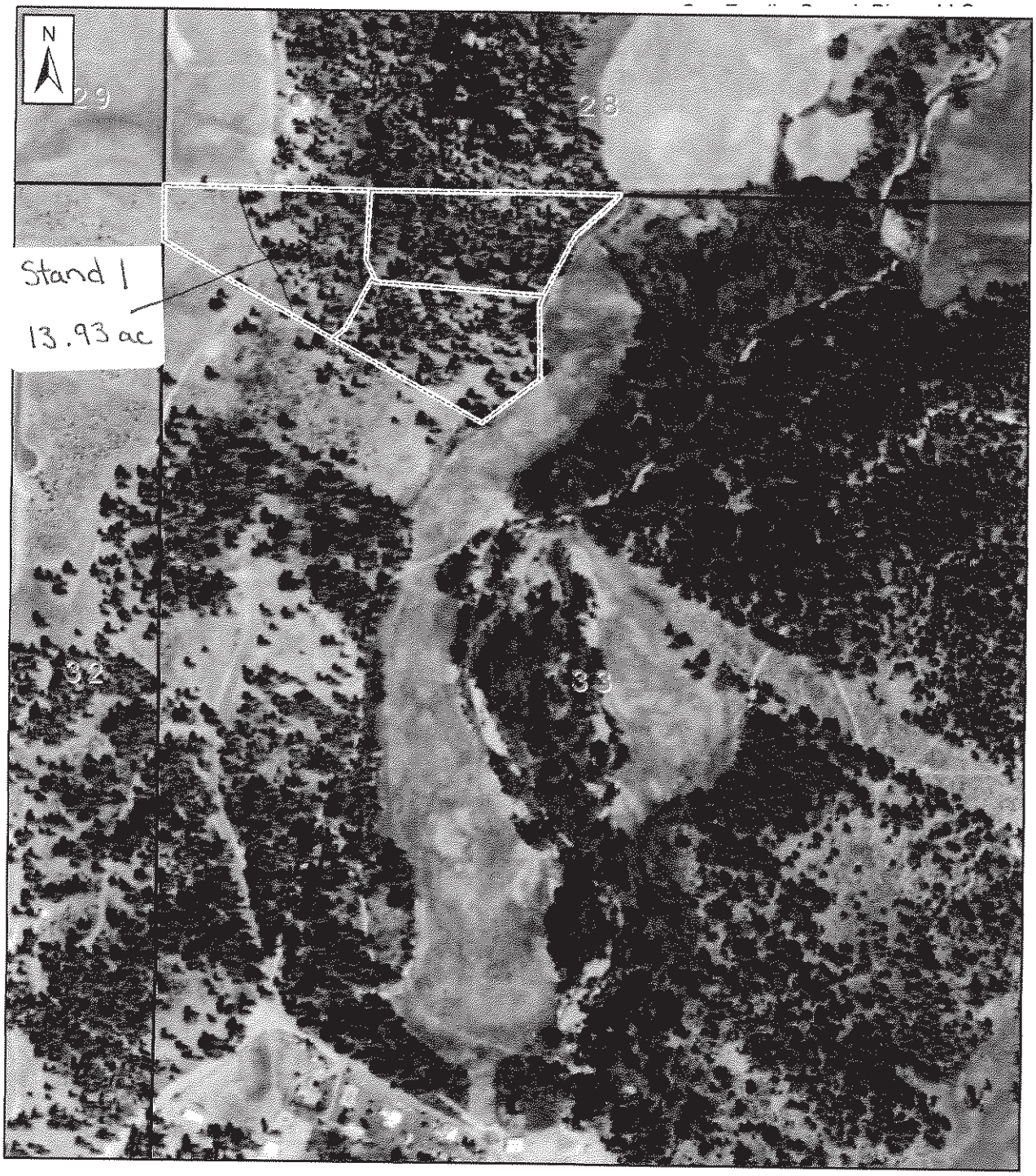

Section Line
Ownership Boundary

0 500 1,000
Feet

Phil Hess F&LS

2009 Aerial Photograph

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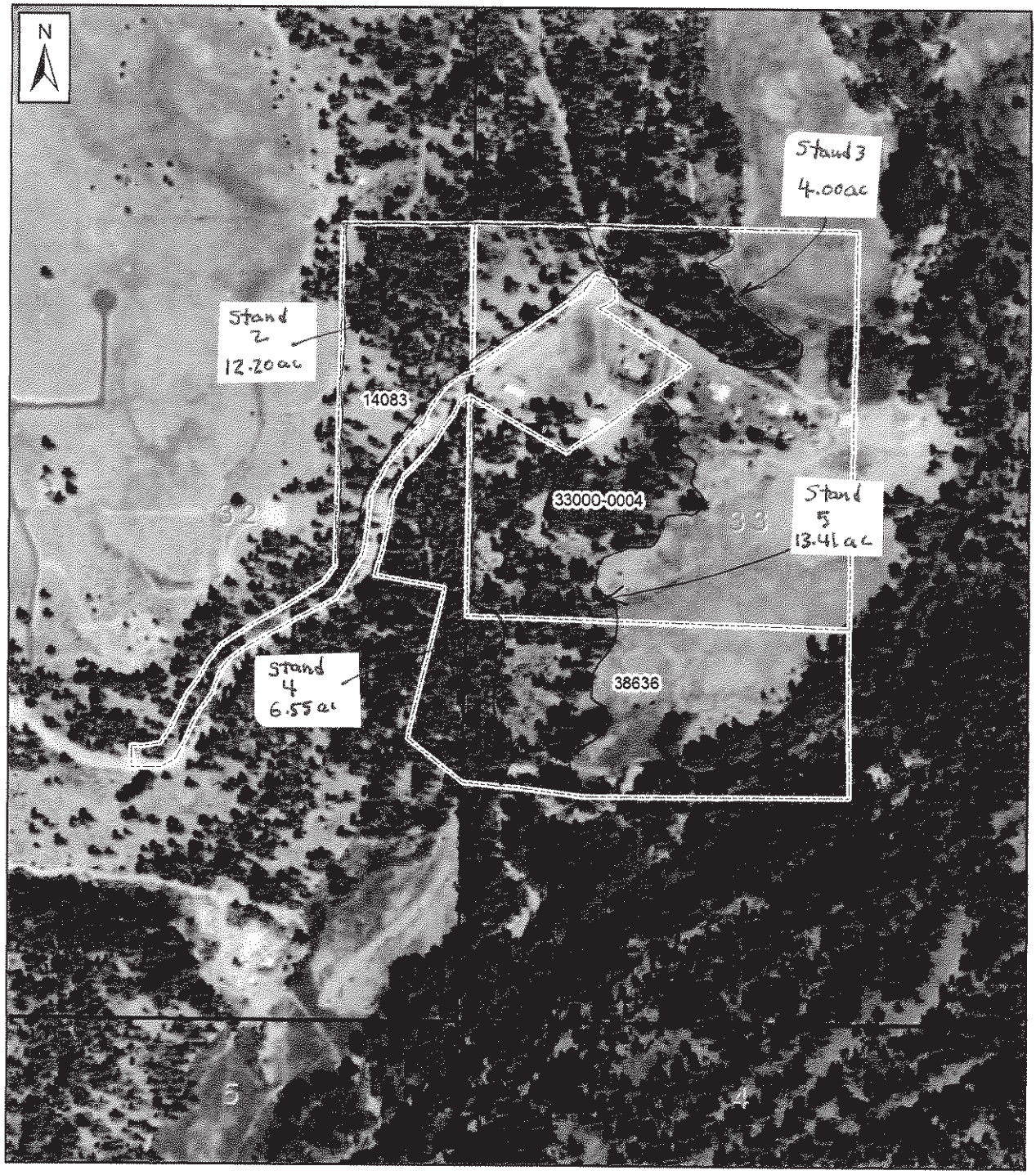

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Feet

Section Line Ownership Bdy

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Stand 1, 13.93 acres – This stand includes a portion of tax parcel 16565 and all of tax parcels 16564, 953887, 16563, and 953886 .

Overview of Stand 1 from top of slope. This is a single layer stand, dominated by ponderosa pine (PP). There are a few widely spaced Douglas fir (DF). There is evidence the stand was logged about 20 years ago.

The shrub layer is bitterbrush, service berry, snowberry, Oregon grape and some bittercherry, The herbaceous layer is bluebunch wheatgrass, Idaho fescue, pinegrass lupine, balsam root, western yarrow, strawberry and a variety of spring wildflowers. This species mix is typical of the shrub/herbaceous layers on all parcels and stands.

In Stand 1, the bitterbrush and service berry is heavily browsed, indicating that this area is seasonally heavily used by deer and elk.

Interior of Stand 1 – Although vigor and health from a distance appears ok, closer examination reveals the pines are infected with dwarf mistletoe in varying degrees. Mistletoe is also infecting the scattered natural PP regeneration. More about mistletoe in the Forest Health section.

Overview of Stand 1 at this location:

Species Mix: 95% PP, 5% DF.

Average Diameter Size: 18" DBH; about 8-10 MBF/acre total volume.

Average Basal Area stocking: 104 SF/ acre

Ave. number Trees per acre: 60 TPA

Height: 85' – 100'

Canopy closure: 20%- 40% with live crown ratios (LCR) ranging from 30% to 50% +.

Sample tree: PP, 17.6" DBH, 90 feet in Ht; 13 RPI, meaning trees are growing about 1" in diameter every 6.5 years; pretty slow for this site which indicates that mistletoe is beginning to have a negative affect on vigor and growth.

Stand 1 Management Recommendations. –

If it were not for the mistletoe health issue, this would be a very nice stand. However, as time goes on trees are going to decline in health and be more pre-disposed to pine bark beetle attacks which will eventually lead to mortality. This situation can be alleviated by a light commercial thinning entry to reduce stocking to around 60-80 SF/acre, removing the trees with a Hawksworth mistletoe rating of 5 or 6 (See supplemental attachments for Hawksworth rating system – 6 is the highest rating). By reducing stocking there will be less inter-tree competition for soil moisture and the trees will be more vigorous and able to live with the mistletoe.

As the stand is opened up natural regen should occur and begin the establishment of the next generation of trees. When this occurs the mistletoe can be controlled by pruning out infected limbs in the young trees.

Stand 2, 12.20 acres. This stand is tax parcel 14083 and also includes the northeastern portion of tax parcel 445635, north of the county road.

Stand 2 – This is a nice 2nd growth ponderosa pine stand, 40-60 years of age. Trees show good vigor with little or no mistletoe. The shrub layer is well established, heavy to snowberry and service berry and is not heavily browsed like in Stand 1.

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: 98% PP, 2% DF.

Average Diameter Size: 13" DBH; about 6 MBF/acre total volume.

Average Basal Area stocking: 90 SF/ acre

Ave. number Trees per acre: 90 TPA

Height: 85' – 100'

Canopy closure: 40%- 60% with live crown ratios (LCR) ranging from 30% to 50% +.

Sample tree: PP, 21.1" DBH, 95 feet in Ht; 16 RPI, meaning trees are growing about 1" in diameter every 8 years.

Stand 2 Management recommendations-

The stand is in good health. Commercial thinning will benefit growth and vigor in the long term and is recommended within the next 10 years to about 80 SF/acres. Select to leave the trees with full crowns (> 30% LCR).

Stand 3, 4.00 acres. This stand is in the northeast part of tax parcel 445635, on the north facing slope.

Stand 3 - This stand has not had a commercial harvest entry since the railroad logging era. There is a cohort of old growth ponderosa pine in the overstory with trees up to 26" DBH. The stand is over stocked for growth and health and would benefit from a commercial thinning. The shrub layer species is the same as in other stands, but with the addition of oceanspray, hazelnut, vine maple, and some willow.

Overview of Stand 3 at this location:

Species Mix: 60% PP, 40% DF.

Average Diameter Size: 16" DBH; about 15 MBF/acre total volume.

Average Basal Area stocking: 300 SF/ acre

Ave. number Trees per acre: 350 TPA

Height: 90'-110'

Canopy closure: 50% with live crown ratios (LCR) ranging from 40% to 60. .

Sample tree: PP, 19.3" DBH, 102 feet in Ht; 11 RPI, meaning trees are growing about 1" in diameter every 5.5 years.

Stand 3 Management recommendations-

The stand is in good health. Commercial thinning will benefit growth and vigor in the long term and is recommended within the next 10 years to about 100 SF/acre. Select to leave the trees with full crowns (> 30% LCR).

Stand 4, 6.55 acres. This stand is tax parcel 14084 and also includes a small portion of tax parcel 44635 in the south west portion and part of tax parcel 038536 in the west portions.

Stand 4 – A very nice stand of 2nd growth ponderosa pine; about 40-60 years of age. This portion of Stand 4 was pre-commercially thinned (PCT) in the 1960's and the lower branches pruned. The low shrub layer here is snowberry.

Overview of Stand 4 at this location:

Species Mix: 98% PP, 2% DF.

Average Diameter Size: 14" DBH, up to 22" DBH; about 7 MBF/acre total volume.

Average Basal Area stocking: 120 SF/ acre

Ave. number Trees per acre: 100 TPA

Height: 90'-110'

Canopy closure: 60% with live crown ratios (LCR) ranging from 20% to 40%.
Sample tree: PP, 17.5" DBH, 87 feet in Ht; 14 RPI, but was 6-8 RPI.

Stand 4 in tax parcel 48636 – In this portion of Stand 4 stocking is 200 SF/ac; there is some DF natural regen. There are very old stumps in this area which tell us that this was last logged during the railroad logging era.

Sample tree: PP 16.6" , 105', with 30% LCR is growing at 18 RPI.

Another view of Stand 4 in 38636. Needs commercial thinning down to 80-100 SF/acre.

Stand 4 Management recommendations-

The stand is in good health. Commercial thinning will benefit growth and vigor in the long term and is recommended within the next 10 years to about 80 SF/acre. Select to leave the trees with full crowns (> 30% LCR).

Stand 5, 13.41 acres. This stand is in tax parcels 38636 and 445635.

Stand 5 – is a more complex stand structure with a range of sizes, ages and stocking. Mistletoe in the pine is common.

Stand 5 – There has been no logging since the railroad logging era and like Stand 2 there is a cohort of old growth orange to yellow bark ponderosa pine. The younger pine is 60-80 years of age.

Stand 5 overview:

Species Mix: 75% PP, 25% DF.

Average Diameter Size: 18" DBH, up to 26" DBH; about 10 MBF/acre total volume.

Basal Area stocking range: 90 - 140 SF/ acre

Ave. number Trees per acre: 70 TPA

Height: 60'-90'

Canopy closure: Varies from 10% to 60% with live crown ratios (LCR) ranging from 20% to 40%.

Stand 5 Management recommendations-

Except for the occurrence of mistletoe, the stand is in good health. A Commercial thinning entry is recommended within the next 10 years in order to remove mistletoed trees and reduce stocking in overstocked patches to about 80 SF/ac. Select to leave mistletoe free trees with full crowns (> 30% LCR).

Commercial Timber Harvest considerations –

Commercial thinning has been recommended in all stands to either control the spread of mistletoe or adjust stocking levels to reduce inter-tree competition for moisture or a combination of both. This management practice will improve the resiliency of trees to withstand the periodic bark beetle 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 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 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 PP in Stand 1 and Stand 5.

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.

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 in Stand 5. This is an example of Hawksworth rating of 6 .... the highest. See supplemental attachment for Hawksworth details.

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 out break 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.

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 Hidden Valley area; these plans are usually initiated through local landowner coalitions (or core groups) and involve the local Fire District, DNR and USFS.

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.*

NOXIOUS WEEDS

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

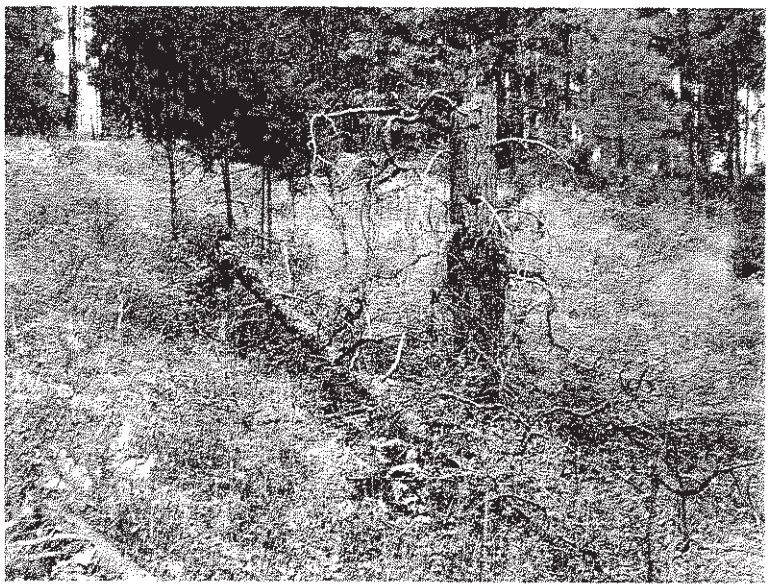
The acceptable herbicide prescription recommended by the County Weed Board is available on their website. This treatment is effective in our area when applied at the knapweed rosette stage in May-June. Localized infestations can be treated with a regular garden type weed sprayer using the recommended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

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 5. 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
Hawksworth Dwarf Mistletoe Rating System

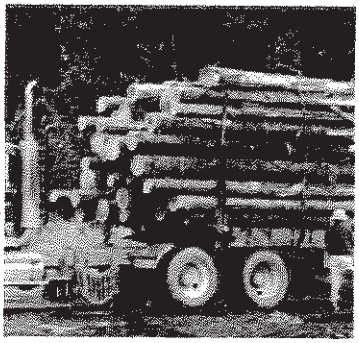
If you have any questions or comments, please contact the plan preparer
Phil Hess, Consulting Forester 509-952-0678
Email: hessphil@msn.com

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**.

Department of Revenue

http://dor.wa.gov

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.

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2011 KITTITAS COUNTY NOXIOUS WEED LIST

Common Name	Scientific Name
CLASS A NOXIOUS WEEDS	
buffalobur	*Solanum rostratum*
common crupina	*Crupina vulgaris*
cordgrass, common	*Spartina anglica*
cordgrass, dense-flowered	*Spartina densiflora*
cordgrass, saltmeadow	*Spartina patens*
cordgrass, smooth	*Spartina alterniflora*
dyer's woad	*Isatis tinctoria*
eggleaf spurge	*Euphorbia oblongata*
false-brome	*Brachypodium sylvaticum*
floating primrose-willow	*Ludwigia peploides*
flowering rush	*Butomus umbellatus*
garlic mustard	*Alliaria petiolata*
giant hogweed	*Heracleum mantegazzianum*
goatsrue	*Galega officinalis*
hawkweed, European	*Hieracium sabaudum*
hawkweed, yellowdevil	*Hieracium floribundum*
hydrilla	*Hydrilla verticillata*
johnsongrass	*Sorghum halepense*
knapweed, bighead	*Centaurea macrocephala*
knapweed, Vochin	*Centaurea nigrescens*
kudzu	*Pueraria montana* var. *lobata*
meadow clary	*Salvia pratensis*
purple starthistle	*Centaurea calcitrapa*
reed sweetgrass	*Glyceria maxima*
ricefield bulrush	*Schoenoplectus mucronatus*
sage, clary	*Salvia sclarea*
sage, Mediterranean	*Salvia aethiopis*
shiny geranium	*Geranium lucidum*
silverleaf nightshade	*Solanum elaeagnifolium*
Spanish broom	*Spartium junceum*
spurge flax	*Thymelaea passerina*
Syrian beancaper	*Zygophyllum fabago*
Texas blueweed	*Helianthus ciliaris*
thistle, Italian	*Carduus pycnocephalus*
thistle, milk	*Silybum marianum*
thistle, slenderflower	*Carduus tenuiflorus*
variable-leaf milfoil	*Myriophyllum heterophyllum*
velvetleaf	*Abutilon theophrasti*
wild four-o'clock	*Mirabilis nyctaginea*
CLASS C NOXIOUS WEEDS	
absinth wormwood	*Artemisia absinthium*
babysbreath	*Gypsophila paniculata*
black henbane	*Hyoscyamus niger*
cereal rye	*Secale cereale*
common groundsel	*Senecio vulgaris*
common St. Johnswort	*Hypericum perforatum*
common tansy	*Tanacetum vulgare*
field bindweed	*Convolvulus arvensis*
fragrant waterlily	*Nymphaea odorata*
hairy whitetop	*Cardaria pubescens*
hawkweed, common	*Hieracium lachenalii*
hawkweeds, nonnative spp.	*Hieracium* spp.
hoary cress	*Cardaria draba*
jointed goatgrass	*Aegilops cylindrica*
old-man's-beard	*Clematis vitalba*
scentless mayweed	*Matricaria perforata*
smoothseed alfalfa dodder	*Cuscuta approximata*
spikeweed	*Hemizonia pungens*
spiny cocklebur	*Xanthium spinosum*
thistle, bull	*Cirsium vulgare*
thistle, Canada	*Cirsium arvense*
white cockle	*Silene latifolia* ssp. *alba*
yellowflag iris*	*Iris pseudacorus*
yellow toadflax	*Linaria vulgaris*
cornflower (bachelor's button)*	*Centaurea cyanus*
horseweed (marestail)*	*Conyza canadensis*
russian thistle*	*Salsola iberica*
* Control required in designated areas	
Highlight indicates known presence in Kittitas County	
**If you are aware of any noxious weeds that are not highlighted, please contact the Kittitas County Weed Board	

Common Name	Scientific Name
CLASS B NOXIOUS WEEDS	
Austrian fieldcress	*Rorippa austriaca*
blackgrass	*Alopecurus myosuroides*
blueweed	*Echium vulgare*
Brazilian elodea	*Egeria densa*
bugloss, annual	*Anchusa arvensis*
bugloss, common	*Anchusa officinalis*
butterflybush*	*Buddleja davidii*
camelthorn	*Alhagi maurorum*
common catsear	*Hypochaeris radicata*
common fennel	*Foeniculum vulgare*
common reed (nonnative	*Phragmites australis*
Dalmatian toadflax	*Linaria dalmatica*
Eurasian watermilfoil*	*Myriophyllum spicatum*
fanwort	*Cabomba caroliniana*
gorse	*Ulex europaeus*
grass-leaved arrowhead	*Sagittaria graminea*
hairy willowherb	*Epilobium hirsutum*
hawkweed oxtongue	*Picris hieracioides*
hawkweed, mouseear	*Hieracium pilosella*
hawkweed, orange	*Hieracium aurantiacum*
hawkweed, polar	*Hieracium atratum*
hawkweed, queen-devil	*Hieracium glomeratum*
hawkweed, smooth	*Hieracium laevigatum*
hawkweed, yellow	*Hieracium caespitosum*
herb-Robert	*Geranium robertianum*
hoary alyssum	*Berteroa incana*
houndstongue	*Cynoglossum officinale*
indigobush	*Amorpha fruticosa*
knapweed, black	*Centaurea nigra*
knapweed, brown	*Centaurea jacea*
knapweed, diffuse	*Centaurea diffusa*
knapweed, meadow	*Centaurea jacea x nigra*
knapweed, Russian	*Acroptilon repens*
knapweed, spotted	*Centaurea stoebe*
knotweed, Bohemian	*Polygonum bohemicum*
knotweed, giant	*Polygonum sachalinense*
knotweed, Himalayan	*Polygonum polystachyum*
knotweed, Japanese	*Polygonum cuspidatum*
kochia	*Kochia scoparia*
lawnweed	*Soliva sessilis*
lepyrodiclis	*Lepyrodiclis holosteoides*
longspine sandbur	*Cenchrus longispinus*
loosestrife, garden	*Lysimachia vulgaris*
loosestrife, purple	*Lythrum salicaria*
loosestrife, wand	*Lythrum virgatum*
oxeye daisy	*Leucanthemum vulgare*
parrotfeather	*Myriophyllum aquaticum*
perennial pepperweed	*Lepidium latifolium*
perennial sowthistle	*Sonchus arvensis*
poison-hemlock	*Conium maculatum*
policeman's helmet	*Impatiens glandulifera*
puncturevine	*Tribulus terrestris*
rush skeletonweed	*Chondrilla juncea*
saltcedar**	*Tamarix ramosissima*
Scotch broom	*Cytisus scoparius*
spurge laurel	*Daphne laureola*
spurge, leafy	*Euphorbia esula*
spurge, myrtle*	*Euphorbia myrsinites*
sulfur cinquefoil	*Potentilla recta*
swainsonpea	*Sphaerophysa salsula*
tansy ragwort	*Senecio jacobaea*
thistle, musk	*Carduus nutans*
thistle, plumeless	*Carduus acanthoides*
thistle, Scotch	*Onopordum acanthium*
water primrose	*Ludwigia hexapetala*
white bryony	*Bryonia alba*
wild carrot	*Daucus carota*
wild chervil	*Anthriscus sylvestris*
yellow archangel	*Lamiastrum galeobdolon*
yellow floatingheart	*Nymphoides peltata*
yellow nutsedge	*Cyperus esculentus*
yellow starthistle	*Centaurea solstitialis*

The Noxious Weed List of Kittitas County (RCW 17.10.090) is comprised of all Class A and Class B noxious weeds described in the 2011 Washington State Noxious Weed List (WAC 16-750) and the Class C weeds listed above

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 ≥ 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".

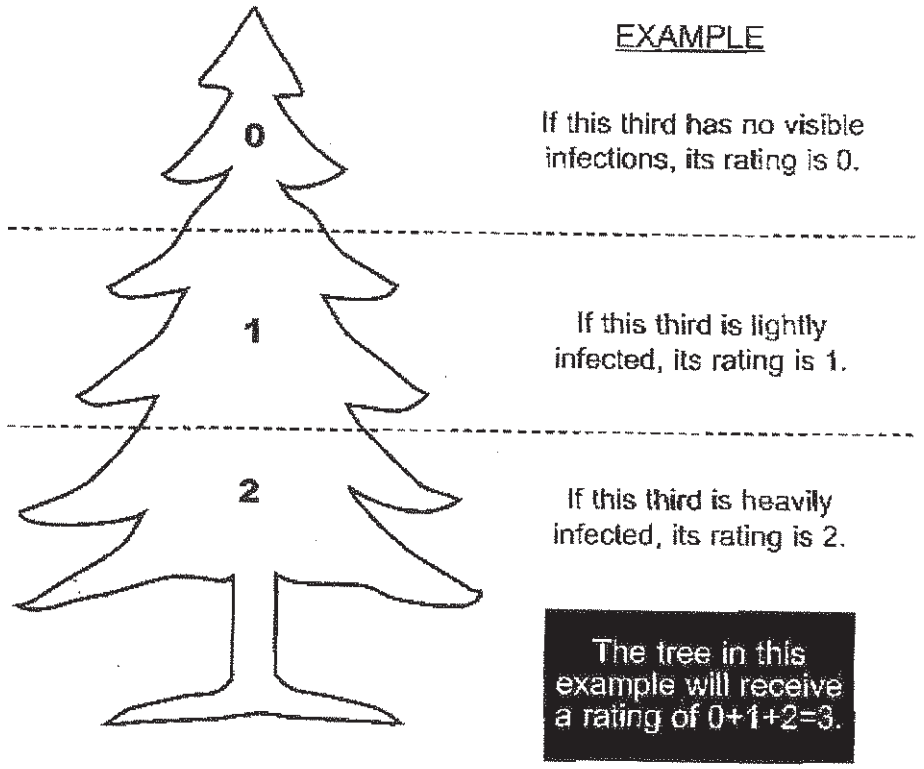

Figure from Goheen and Willhite (2006).