Department of Revenue
Washington State

Application for Classification or Reclassification as Open Space Land or Timber Land for Current Use Assessment under Chapter 84.34 RCW

File With The County Legislative Authority

Name of Applicant: Edwin and Diane Doern Phone No: 425-418-8839

Address: PO Box 183 Mukilteo, WA 98275

Property Location: 235 Big Sky Vista Dr., Cle Elum, WA

1. Interest in property: ☑ Fee owner ☐ Contract purchaser ☐ Other (Describe) _____
2. Assessor's Parcel or Account No.: 176608

   Legal description of land to be classified: Sec. 22, Twp 20, Rge 15; Ptn. NE/4; Ptn SE/4 (Lot 10 B-27/P205-206)
3. Land classification that is being sought: ☐ Open Space ☑ Timber Land

   NOTE: A single application may be made for both **open space and timber land**, but a separate legal description must be furnished for each area that **classification is being sought**.
4. Total acres in application: 19

5. **Open Space Classification** Number of acres: _____
6. Indicate what category of open space this land will qualify for:

   ☐ Conserve and enhance natural or scenic resources

   ☐ Protect streams or water supply

   ☐ Promote conservation of soils, wetlands, beaches or tidal marshes

   ☐ Enhance public recreation opportunities

   ☐ Enhance value to public of abutting or neighboring parks, forests, wildlife preserves, nature reservations or sanctuaries or other open space

   ☐ Preserve historic sites

   ☐ Preserve visual quality along highway, road, and street corridors or scenic vistas

   ☐ Retain in natural state tracts of one (1) or more acres in urban areas and open to public use as reasonably required by granting authority

   ☐ Farm and agricultural conservation land as defined in RCW 84.34.020(8)

7. Timber Land Classification Number of acres: _____

Definition: "Timber land" means any parcel of land that is five or more acres or multiple parcels of land that are contiguous and total five or more acres which is or are devoted primarily to the growth and harvest of forest crops for commercial purposes. "Timber land" means land only and does not include a residential home site. The term includes land used for incidental uses that are compatible with the growing and harvesting of timber but no more than ten percent of the land may be used for such incidental uses. It also includes the land on which appurtenances necessary for the production, preparation, or sale of the timber products exist in conjunction with land producing these products.

A timber management plan shall be filed with the county legislative authority either (a) when an application for classification as timber land pursuant to this chapter is submitted; (b) when a sale or transfer of timber land occurs and a notice of classification continuance is signed; or (c) within sixty days of the date the application for reclassification under this chapter is received. The application for reclassification will be accepted but not processed until the timber management plan is received. If the timber management plan is not received within sixty days of the date the application for reclassification is received, the application for reclassification shall be denied. If circumstances require it, the county assessor may allow in writing an extension of time for submitting a timber management plan when an application for classification or reclassification or notice of continuance is filed. When the assessor approves an extension of time for filing the timber management plan, the county legislative authority may delay processing an application until the timber management plan is received. If the timber management plan is not received by the date set by the assessor, the application or the notice of continuance shall be denied.

8. Submit a copy of your timber management plan with this application.

A timber management plan will include the following elements:

a) a legal description of, or assessor's parcel numbers for, all land the applicant desires to be classified or reclassified as timber land,

b) date or dates of acquisition of the land,

c) a brief description of timber, or if harvested, the owners plan for restocking,

d) whether there is a forest management plan for the land,

e) if so, the nature and extent of implementation of the plan,

f) if land is used for grazing,

g) whether the land has been subdivided or a plat filed with respect to the land,

h) whether land and applicant are in compliance with restocking, forest management, fire protection, insect and disease control, etc.,

i) whether the land is subject to forest fire protection assessments pursuant to RCW 76.04.610,

j) whether the land is subject to a lease, option, or other right that permits it to be used for a purpose other than growing and harvesting timber,

k) a summary of past experience and activity of the applicant in growing and harvesting timber,

l) a summary of current and continuing activity of the applicant in growing and harvesting timber,

m) a statement that the applicant is aware of the potential tax liability involved when the land ceases to be classified as timber land

9. Describe the present improvements on this property (buildings, etc.) Residence is under construction on 1 acre. that is adjacent.

10. Is this land subject to a lease or agreement which permits any other use than its present use?

☐ Yes ☑ No

If yes, attach a copy of the lease agreement.

NOTICE: The assessor may require owners to submit pertinent data regarding the use of classified land.

Open Space Land Means:

(a) Any land area so designated by a comprehensive land use plan adopted by a city or county authority, or

(b) Any land area, in which the preservation in its present use would:

- (i) Conserve and enhance natural or scenic resources,
- (ii) Protect streams or water supply,
- (iii) Promote conservation of soils, wetlands, beaches or tidal marshes,
- (iv) Enhance the value to the public of abutting or neighboring parks, forests, wildlife preserves, nature reservations or sanctuaries or other open space,
- (v) Enhance recreation opportunities,
- (vi) Preserve historic sites,
- (vii) Preserve visual quality along highway, road, and street corridor or scenic vistas, or
- (viii) Retain in its natural state tracts of land not less than one acre situated in an urban area and open to public use on such conditions as may be reasonably required by the granting authority.

(c) Or, any land meeting the definition of "farm and agricultural conservation land".

Statement of Additional Tax, Interest, and Penalty Due Upon Removal of Classification

1. Upon removal of classification, an additional tax shall be imposed which shall be due and payable to the county treasurer 30 days after removal or upon sale or transfer, unless the new owner has signed the Notice of Continuance. The additional tax shall be the sum of the following:

(a) The difference between the property tax paid as "Open Space Land" or "Timber Land" and the amount of property tax otherwise due and payable for the last seven years had the land not been so classified; plus

(b) Interest upon the amounts of the difference (a), paid at the same statutory rate charged on delinquent property taxes.

(c) A penalty of 20% shall be applied to the additional tax and interest if the classified land is applied to some other use except through compliance with the property owner's request for withdrawal process, or except as a result of those conditions listed in (2) below.

2. The additional tax, interest, and penalty specified in (1) above shall not be imposed if removal resulted solely from:

(a) Transfer to a governmental entity in exchange for other land located within the State of Washington.

(b) A taking through the exercise of the power of eminent domain, or sale or transfer to an entity having the power of eminent domain in anticipation of the exercise of such power.

(c) A natural disaster such as a flood, windstorm, earthquake, or other such calamity rather than by virtue of the act of the landowner changing the use of such property.

(d) Official action by an agency of the State of Washington or by the county or city where the land is located disallows the present use of such land

(e) Transfer of land to a church when such land would qualify for property tax exemption pursuant to RCW 84.36.020.

(f) Acquisition of property interests by State agencies or agencies or organizations qualified under RCW 84.34.210 and 64.04.130 (See RCW 84.34.108(6)(f)).

(g) Removal of land classified as farm & agricultural land under RCW 84.34.020(2)(e) (farm homesite).

(h) Removal of land from classification after enactment of a statutory exemption that qualifies the land for exemption and receipt of notice from the owner to remove the land from classification.

(i) The creation, sale, or transfer of forestry riparian easements under RCW 76.13.120.

(j) The creation, sale, or transfer of a conservation easement of private forest lands within unconfined channel migration zones or containing critical habitat for threatened or endangered species under RCW 76.09.040.

(k) The sale or transfer of land within two years after the death of the owner of at least a fifty percent interest in the land if the land has been assessed and valued as designated forest land under chapter 84.33 RCW, or classified under this chapter 84.34 RCW continuously since 1993. The date of death shown on the death certificate is the date used.

(l) The discovery that the land was classified in error through no fault of the owner.

Affirmation

As owner(s) of the land described in this application, I hereby indicate by my signature that I am aware of the potential tax liability involved when the land ceases to be classified under provisions of Chapter 84.34 RCW. I also declare under the penalties for false swearing that this application and any accompanying documents have been examined by me and to the best of my knowledge it is a true, correct, and complete statement.

The agreement to tax according to use of the property is not a contract and can be annulled or canceled at any time by the Legislature (RCW 84.34.070).

Signatures of all Owner(s) or Contract Purchaser(s):

_____ _____

_____ _____

All owners and purchasers must sign.

FOR LEGISLATIVE AUTHORITY USE ONLY

Date application received: _____ By: _____

Amount of processing fee collected: $_____ Transmitted to: _____ Date: _____

FOR GRANTING AUTHORITY USE ONLY

Date received: _____ By: _____

☐ Application approved ☐ Approved in part ☐ Denied Owner notified of denial on: _____

Agreement executed on: _____ Mailed on: _____

For tax assistance, visit dor.wa.gov/content/taxes/property/default.aspx or call 1-800-647-7706. To inquire about the availability of this document in an alternate format for the visually impaired, please call (360) 705-6715. Teletype (TTY) users may call 1-800-451-7985.

FOREST LAND MANAGEMENT PLAN

Submitted by

Edwin and Diane Doern
Mailing Address is:
PO Box 153
Mukeltio, WA 98275
425-418-8839

Property Address is:
235 Big Sky Vista Drive (Private)
(Off of Big Sky Vista Drive – private)

To

Kittitas County

For

Transfer from Designated Forestland to Open Space-timber tax status
RCW 84.34

Tax Parcel Number:
P 17668
20-15-22000-0010
20.00 Acres
19.00 acres OS-t

Legal Description
Lot 10, BLA Bk 28 Pg 177-178 of Surveys
in Sec. 22, T20N, R15E

PLAN DATE: Feb, 2007
Updated 2-28-2011

Prepared by:
Phil Hess, Consulting Forester
Forest & Land Services
PO Box 9
Cle Elum, WA 98922
509-952-0678
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INTRODUCTION

Acquisition date: Jan, 2007
The land is in compliance with Title 76 RCW.
The land is not presently used for grazing.
The land is subject to forest patrol assessment.

This updated plan is being submitted by the owner to transfer form *Designated Forest Land* tax status pursuant to RCW 84.33 to Open Space-timber under RCW 84.34 and Kittitas County Commissioner's Resolution No. 2002-99 [94-25]. Also, this plan is hereby amended by this reference to replace the 1999 County Fire Safety and Prevention Plan with the County Wildfire Protection Plan adopted under BOCC Resolution 2009-18 dated 2/18/09. Also this plan is amended by this reference to include County Code Title 12, Roads and Bridges.

GOALS and OBJECTIVES

The owners are committing to a long-term forest management plan that will maintain and enhance the mixed conifer forest and to comply with the *Open Space timber* current use tax statute, Chapter RCW 84.34. The goal is to create and maintain a healthy, firesafe forest, provide wildlife habitat, and protect soil and water resources. The owner intends to gain a working knowledge of applicable forestry and related resource stewardship practices from 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 stewardship of all resources inherent with a forested landscape, providing significant natural resource and environmental benefits to the neighborhood and community.

The plan will be reviewed in 5 years and updated as necessary. The new owners are aware that RCW 84.34 provides for current use tax status for forest land that is used *primarily for growing and harvesting of timber.* There is a potential tax liability if the land becomes ineligible for current use tax status under RCW 84.34.

LOCATION and LAND USE HISTORY

The property is located approximately 1 mile north of Cle Elum via a private road system from Cle Elum, on the lower, south-facing slopes of Cle Elum Ridge. Adjacent properties are all private non-industrial ownerships. Traditionally, the predominant land use in this area is timber production, and wildlife habitat. These uses continue but much of the private land in the vicinity has been sold in smaller parcels as rural residential or recreational homesites.

LAND FORM and SOILS – MANAGEMENT CONSIDERATIONS

Property elevations range from 2400 feet near the south line to 2480 feet in the northwest corner. Slopes are moderate to gentle, south facing. Significant features are 2 north-south draws. Average annual precipitation is 20 to 30 inches.

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.

Classifying and mapping soils provides the resource manager with an important tool for judging productivity and selecting 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 classified or designated under the forest tax law.

The soil survey map classifies one forest soil series as illustrated on the attached soils map.

Varelum Variant Sandy Loam (8757)

Varelum Variant is a moderately deep (20 to 40"), well-drained soil formed from Roslyn Sandstone with a mixture of volcanic ash and loess in the top layers. The weathered sandstone bedrock is at about 30". Site index is rated 83 for ponderosa pine (PP), and 90 for Douglas fir (DF) which means these species will potentially reach a heights of 83 feet and 90 feet respectively in 100 years. The potential average annual growth is about 200 BF per acre assuming fully stocked, properly spaced conditions over the long term.

The soil is rated *medium* for compaction potential meaning that heavy equipment should not be operated during wet conditions to avoid soil compaction, which will in turn impede seedling establishment and health of trees. Erosion potential is rated *medium*, indicating only moderate potential for surface erosion but it is still important to maintain a vegetative ground cover to protect the soil and build structure.

Existing ground cover is sufficient to protect the soil from erosion. Any fresh soil disturbances should be promptly seeded to a grass mix to protect the surface from puddling and erosion, and help prevent the invasion of noxious weeds. The recommended seed mix is:

10% Chewings Fescue
30% Draylar Upland Bluegrass
30% VNS Creeping Red Fescue
30% Covar sheep Fescue

Also, a native wildflower mix may be appropriate in some areas. It is advisable to obtain a mix without western yarrow. Contact Phil Hess for the best place to acquire grass seed and wild flower mixes.

Late fall is the best time to prepare a good seed bed and broadcast seed mixes and A straw mulch is advisable, especially around construction sites. Gar Hill has a portable straw mulcher. Phone 674-1260. Seeding too early in the fall may result in fall germination which will increase the risk of winter kill. Spring germination is preferred. Seed to rate of at least 25 lbs. per acre.

VEGETATION RESOURCES and MANAGEMENT

There have been at least two partial cut timber harvest entries since settlement that have resulted in 2 vegetation types or "stands".

Stand 1 – This is nice 2nd growth, 80% closed canopy stand of 95% ponderosa pine and 5% Douglas fir (DF) in the north portion of the parcel. The stand extends southward down the draws where species composition is heavier to DF: 80% PP and 20% DF. Tree sizes range from 6" to 18" DBH (diameter breast height). The north portions of the stand have been pre-commercially thinned by Plum Creek about 1985.

Stand 1, Lot 10. This portion thinned by Plum Creek about 1985. The old thinning slash is still evident and adds to ground fuels.

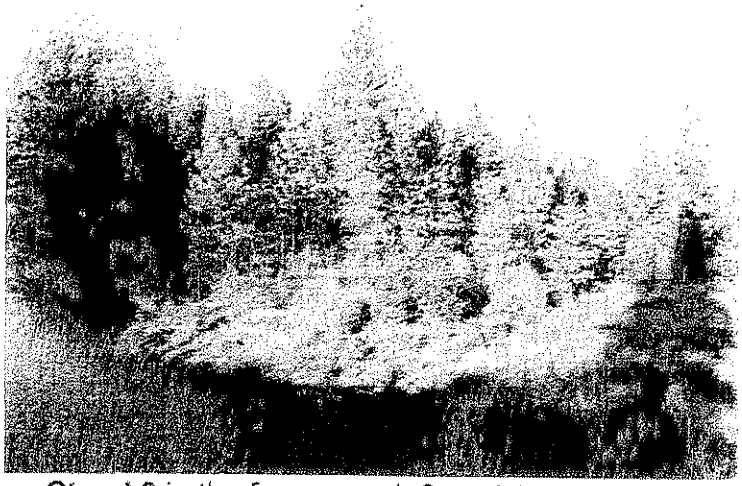
The tall shrubs are willow, hazelnut, ocean spray, with vine maple and bitter cherry in the draws. Medium and low shrubs are snowberry, spirea, Oregon grape, rose, service berry, ceanothus,

The herbaceous layer includes a pinegrass, elksedge, peavine, bulbous bluegrass, balsamroot, biscuitroot, lupine, western yarrow, senecio, strawberry, arnica, coltsfoot, mountain dandelion and kinnikinnick (actually a woody ground cover). Some of the other spring wildflowers include spring beauty, avalanche lily, waterleaf, Indian paintbrush and yellowbell. Cheatgrass is prevalent in old logging disturbed areas.

The herbaceous layer is important to protect soil resources and provide wildlife habitat diversity.

Stand 2 – This stand is situated in the south portion of the parcel on the east and west side of the draws. The stand was seed tree harvested by Plum Creek in the late 1990's, followed by PP seedling planting. The overstory is a wide spaced PP residual. The young planted and naturally regenerated trees are now 6 to 10 feet and height and will meet the stocking requirements for DFL tax status.

Typical view of planted pine in **Stand 2.** There is some natural regeneration.



Stand 2 in the foreground; **Stand 1** in the back.

Another view of **Stand 2.** There are some "holes" in stocking where you may wish to consider supplemental planting.

In general, tree health is good. There is a little or no evidence of endemic insect and disease problems common to Cle Elum Ridge. There is evidence of older pine bark beetle activity that occurred in the early 1990's.

HOW TO TAKE CARE OF YOUR TREES AND PROPERTY

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

- Maintain stands of healthy trees
- Forest fuels management
- Maintain and enhance wildlife habitat values
- Visually attractive landscapes
- Safety for the owners and improvements.
- Control Noxious Weeds

All of these objectives are inter-connected and include the essential element of managing vegetation to minimize risk of property damaging wildfire. Implementation of this plan will achieve a balance of forest fuel levels, wildlife habitat values and the other objectives. On-the-ground prescriptions can be customized for site specific vegetation conditions and to fit the owner's 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 management considerations appropriate on the property for the current plan period. Bear in mind these ideas should be adapted to the landowner's use of the property:

1. Stocking Control -- Tree density or spacing

As with any forest property there are risks. Common or likely on the south slope of Cle Elum ridge are bark beetles, defoliators, root diseases, and mistletoes. There is no evidence of root disease on this parcel and the last bark beetle epidemic occurred in the early 1990's. 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.

Fortunately, through management these risks can be minimized or eliminated. The key here is **stocking control,** meaning tree density or spacing. When trees are too close together they compete with each other for available moisture, then in dry years they become weak (stressed), lose vigor, and are more susceptible to endemic insect and disease attacks. Proper spacing is important at all ages. There are some overstocked areas in **Stand 1** where you may want to consider thinning during the current plan period, especially where firewise landscaping is a priority.

It is important to know 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. The best time of year to thin pine is late summer, fall or winter. Thinning pine in the spring and early summer can attract pine bark beetles (*Ips*) to the green slash and they will quickly spread to standing trees and most likely kill them. If the slash is being burned as you go then beetles won't be a problem. Winter thinning is also a good time so long as equipment is not operated on wet soils. This will cause soil compaction and is detrimental to tree health and growth.

The DF stands can be thinned at any time of year.

Select thinning priorities in **Stand 1** based on firewise and tree health objectives. As the young planted and naturally regenerated trees develop in **Stand 2**, there will be patches or clumps where thinning will also be desirable.

There are areas in **Stand 1** where a light thinning would be desirable for tree health and FireWise.

Cut trees can be piled in a firesafe location and then left as habitat, burned in the late fall, or chipped. If you elect to chip, Gar Hill (674-1260) has a small, portable tractor mounted chipper ideal for this kind of work.

In very young stands, it is not practical to thin out to the ultimate desired spacing with the first entry. To do so would make the leave trees too susceptible to wind, snow or ice damage. Thinning in stages will give leave trees a chance to firm up before the next entry. The first entry should remove

only the smallest trees and those with the weakest crowns. As a guide in young stands, thin to where crowns are just touching or slightly over lapping. The remaining trees may still be too tight in most cases but this is ok and can be remedied in the next entry, 3 to 5 years out. Always select to leave pine, then Doug fir and eliminate grand fir.

Removing high risk trees in and near the future building site will improve the filtered view and eliminate a safety concern. Bear in mind that the residual trees with marginal crowns will do best in groups. If there is a good full crowned tree interfering with the view, then consider pruning some of the limbs to create the filtered view. The trees that are cut can be bucked and left in place. Limbs and tops can be piled in a fire safe location and left for habitat, burned or chipped. (See habitat ideas at the end of this plan)

Understanding Pine 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. We are due for another outbreak because of the current drought.

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.

Douglas Fir Bark Beetles

Key Points—

1) DF bark beetles, like pine beetles, attack trees that are under stress. This can mean lack of moisture, root disease, or defoliators.
2) Foliage will turn yellow and then fade to a reddish brown by late summer or fall.
3) There will be red or yellow boring dust in bark crevices. No pitch tube, but you may see resin streamers on upper stem attacks. This is where pitch has seeped out through the beetle entry hole.
4) Egg galleries are straight, similar to Mountain Pine Beetle.

It is unlikely the DF bark beetles will be a problem on this parcel but there are some pockets of dense DF in the draw where you will want to manage to reduce risk by maintaining proper tree stocking.

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 may be a risk to DF on this property. Population build-up run's in cycles, usually during periods of low precipitation.

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.

Manage stands of DF to reduce impacts with proper tree spacing and species diversity.

Dwarf Mistletoe

Although mistletoe has not been observed on this property, it is common to the area and is something to be aware of.

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 "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.

Understanding Root Diseases

Root diseases were not evident during a recent site examination but it is common to the area, so the following is included for future reference.

Research has confirmed that these 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. There is evidence of root disease on your property, especially in stand 2. Choosing to manage for pine is logical management option. If you notice infected trees, keep in mind the pocket could be ¼ 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. If there are infected trees that will be a danger tree to a structure site, then it is advisable to remove the trees and pull the stump with an excavator, removing as much of the root as possible. This can be done at the same time you are clearing for the house. If you are unsure of the extent of pocket contact your forester.

2. Fire Protection and FireWise

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.

Participation in the FireWise 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.

Community Wildfire Protection Plans (CWPP) are planned for in the entire upper County. Cle Elum Ridge, including this parcel, should be a high priority but 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" guidelines.

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/elksedge 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. Ponderosa pine is the preferred species but Douglas fir is acceptable if it meets the criteria.

The size of defensible space will vary depending on the type and amount of vegetation and topography. For this property, 100 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. **Medium to high shrubs are also a ladder fuel concern, especially in the draws.** Brush mowing is the logical alternative in this situation. The old logging slash pile in the west draw should be burned this winter.

This property is in a moderate to high fire risk situation because of the south facing slopes, the high shrub layer in the draws, dry summer time ground cover and the increasing level of human activity in the neighborhood.

The existing roads in the Vistas community will continue to serve as a break in forest floor fuels. These road fuel breaks can be made more effective by mowing the shrub layer on each side and pruning and thinning the trees. The wider the better but 20' on each side would be a good start. You may wish to consider **establishing and maintaining a shaded fuel**

break on the south property line and the diagonal west line up to the cul de sac.

Bear in mind that a fire beginning on adjacent properties will likely reach this property before fire crews can arrive.

Another possibility would be a water storage reservoir up slope from the house to provide an emergency water source. A portable high pressure pump and sufficient fire hose would provide an additional level of safety.

These measures will not guarantee, but will reduce the risk of a ground fire becoming a crown fire. A specific FireWise prescription is a good idea after you decide the location of your house and can be obtained by contacting Matt Eberlein, Upper County FireWise Coordinator, 674-4366 or myself, Phil Hess, consulting forester, 952-0678.

Pruning

Pruning is desirable when trees are 8' (or more) tall or are about 8" 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.

This is an example of a shaded fuel break in a pine stand on the south slope of Cle Elum ridge. Most of the piles have been burned; some were left for habitat. This stand is older than your Stand 1, but otherwise similar.

There is a vast source of information on FireWise landscaping. Go to www.firewise.org for good information and links.

Although, FireWise landscaping is crucial, it is important to keep in mind that this objective can be met and still retain important wildlife habitat values

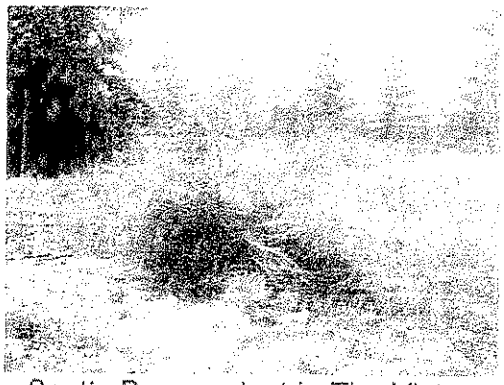
OTHER MANAGEMENT CONSIDERATIONS

NOXIOUS WEEDS

No noxious weeds were observed during the recent site visit. However, knapweed is common in the area and usually invades when soil is disturbed. This noxious weed is very aggressive and it is a good idea to control small patches or single plants. The acceptable herbicide prescription recommended by the County Weed Board is included in the supplemental attachments. This treatment is effective in our area when applied at the knapweed rosette stage in May-June. Several privately licensed herbicide applicators work in Kittitas County, and experienced staff at the Kittitas County Weed Board can provide expert advice on noxious weed control.

You should be especially vigilant for Scotts Broom which has been observed in The Vistas. This is a very aggressive weed that we are trying to

keep out of Kittitas County. If you see this plant, it should be eradicated immediately.



Scotts Broom plant in The Vistas

WILDLIFE HABITAT

The shrub/herbaceous layer is well established and is providing abundant browse for deer and elk. As the young forest develops in Stand 2 the shrub layer will become less dominating but not eliminated. Deer and elk use will continue to be moderate to heavy.

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 as many as 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. Two to six snags per acre are desirable.

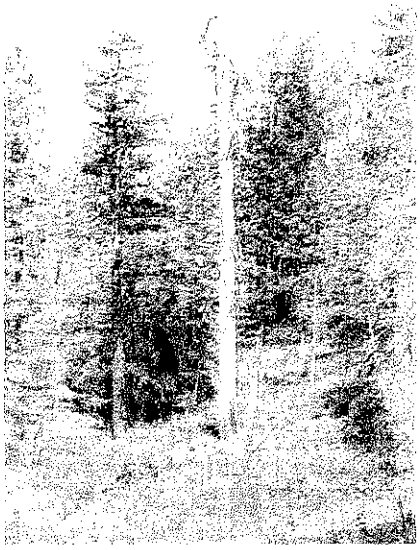
There are many opportunities on your property to provide this important habitat and still meet silvicultural and forest fuels management objectives.

Examples are illustrated on the following pages.

This is an example of a ponderosa pine wildlife tree common on Cle Elum Ridge. Woodpeckers have begun creating cavities in search of insects. These cavities are then used by a large group of secondary cavity nesters. Sometimes these are referred to as "character trees" or Legacy trees.

Save your Wildlife Trees!

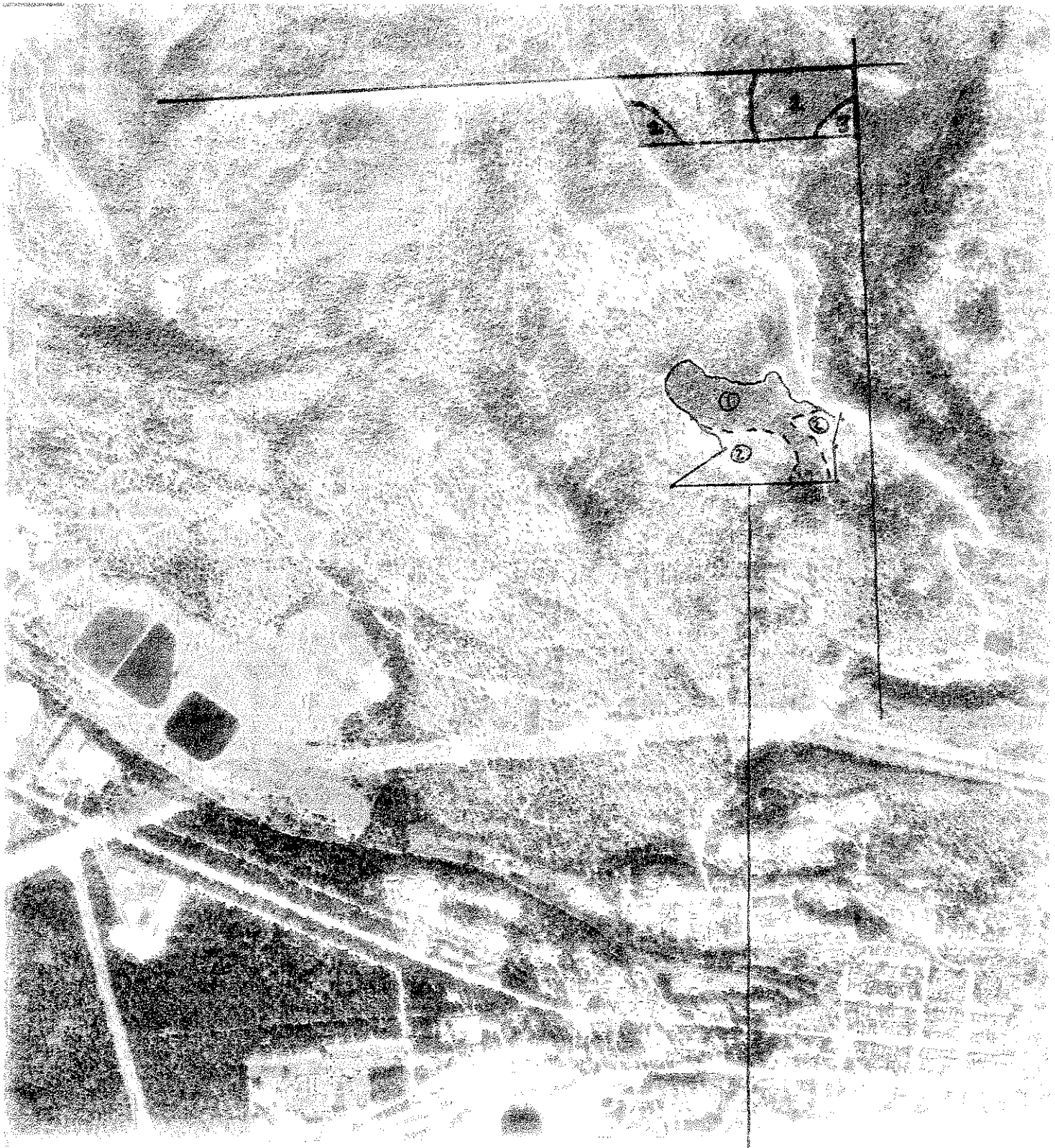
"Birds Eat Bugs"



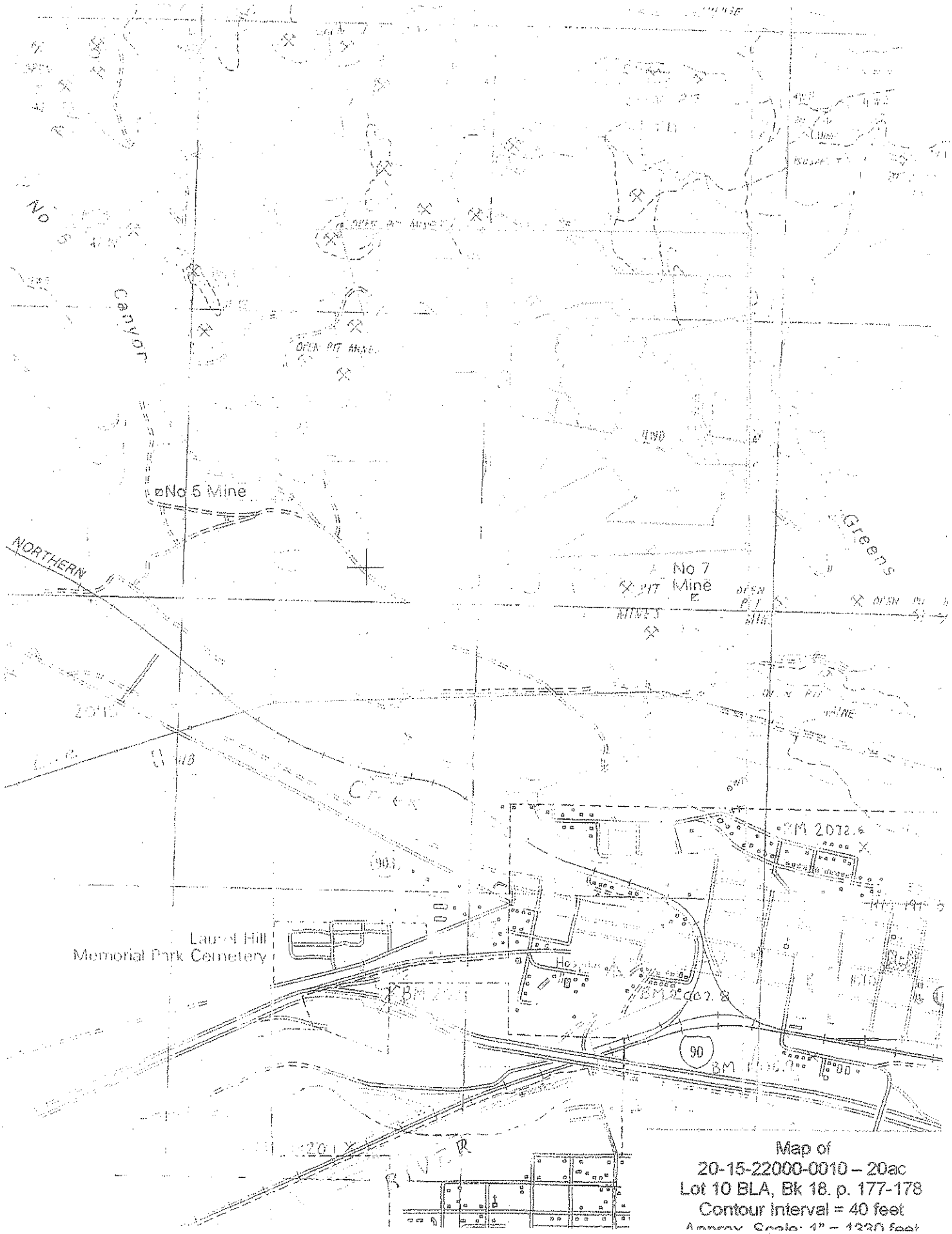
Course Woody Debris (CWD) on the forest floor is a critical element for a healthy forest ecosystem. The decaying wood process provides habitat for many species of fungi, moss, lichens, invertebrates, reptiles, and amphibians that form an integral part of a healthy forest. Nearly all life forms in the forest begin with decaying wood. Also, decaying wood acts as a reservoir for water storage by slowly releasing moisture throughout the summer.

Habitat piles are simply CWD arranged in such a fashion to provide hiding cover and nesting habitat for small mammals and birds, including quail and grouse. Overtime the decay process will "change" the structure of the material adding to diversity. Habitat piles can be located and still meet FireWise objectives. This pile is made with small green material but they can be just as effective with larger material, green or older. Lay a foundation of criss-crossed small logs to create tunnels and cavities. You will find these to be used by wildlife soon after construction.

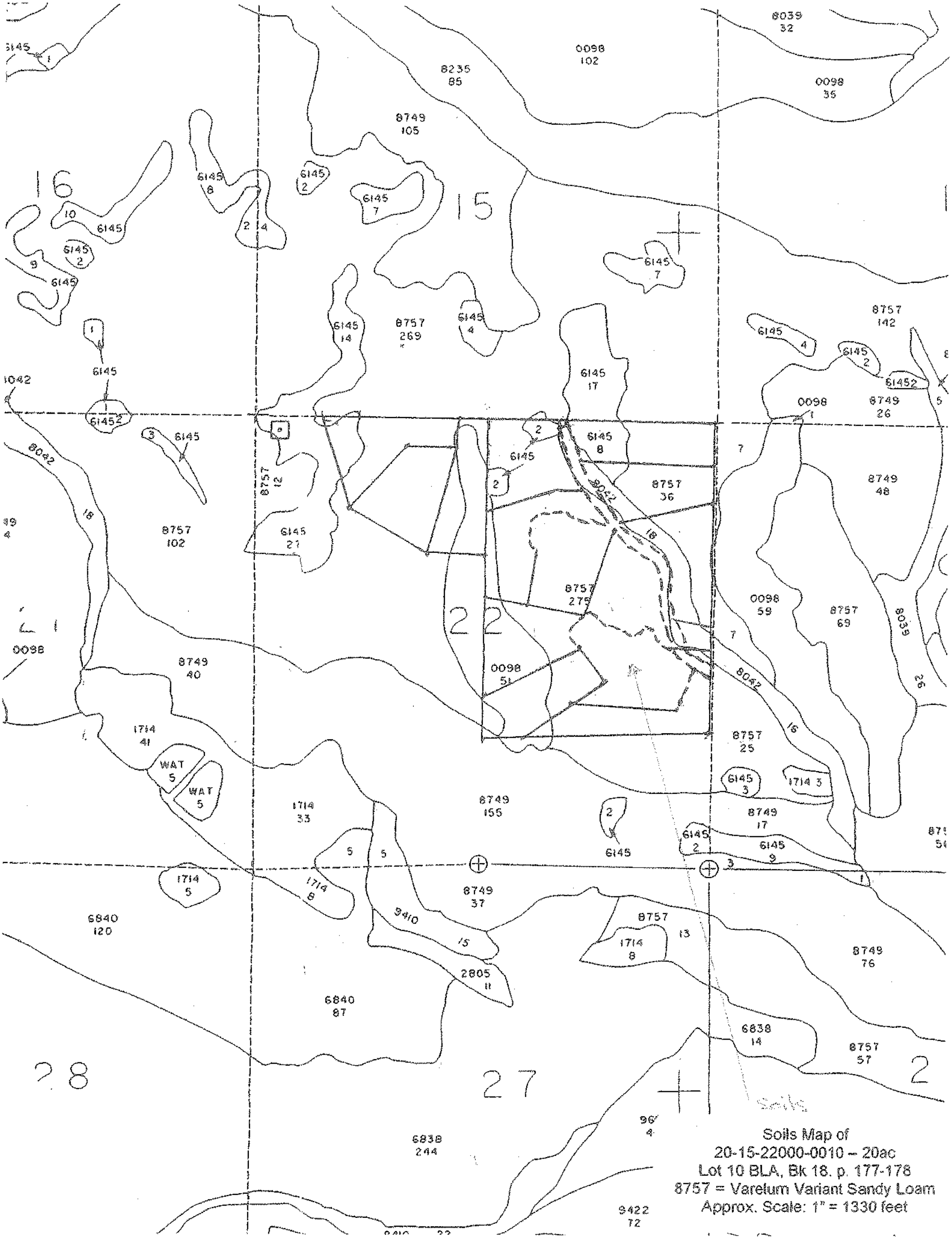
On your property, you can use the old or new thinning slash or material from the removal of risk trees and your house/view tree removal to create these piles in firesafe forest openings and at the same time reduce concentrations of forest floor fuels.



2004 Aerial Photo
20-15-22000-0010 – 20 ac
Lot 10 BLA BK 28, p. 177-178
Approx. Scale: 1" = 1050 '



Map of
20-15-22000-0010 – 20ac
Lot 10 BLA, Bk 18. p. 177-178
Contour interval = 40 feet
Approx. Scale: 1" = 1320 feet



Soils Map of
20-15-22000-0010 – 20ac
Lot 10 BLA, Bk 18. p. 177-178
8757 = Varelum Variant Sandy Loam
Approx. Scale: 1" = 1330 feet

DEFINITIONS

Defensible Space -- the space around residences and other structures maintained free of flammable materials. Live, low-growing, native vegetation is permissible.

Designated Forest Land -- any parcel of land that is twenty or more acres or multiple parcels of land that are contiguous and total twenty or more acres that is or are devoted primarily to growing and harvesting timber pursuant to RCW 84.33. This means the land only, and does not include a residential homesite. And, this also includes land used for incidental uses that are compatible with the growing and harvesting of timber, but no more than ten percent of the land may be used for such incidental uses. In addition, it includes the land on which appurtenances necessary for the production, preparation, or sale of the timber products exist in conjunction with land producing these products.

Kittitas County Ordinance 90-16 -- adopts the wildfire Hazard Rating system in the unincorporated areas of Kittitas County.

Ladder Fuels -- a shrub layer and/or lower limbs of forest trees that may, when excessive, allow ground fires to climb into crowns of trees, creating the risk of a stand replacement wildfire and severe property damage.

Open Space-Open Space -- a current use tax classification to maintain, preserve, conserve, and otherwise continue open space lands for the welfare and benefit of the general public pursuant to RCW 84.34 and Kittitas County Resolution 94-25. The Open Space Taxation Act allows property owners to have their open space, farm and agricultural, and timberlands valued at their current use rather than their highest and best use. See RCW 84.34 and Kittitas County Resolution 94-25 for category or categories of classification.

Open Space Timber -- a current use tax classification to maintain, preserve, conserve, and otherwise continue open space lands for the welfare and benefit of the general public pursuant to RCW 84.34 and Kittitas County Resolution 94-25. Here Timber Land is defined as any parcel of land that is five or more acres or multiple parcels of land that are contiguous and total five or more acres, which is or are devoted primarily to the growth and harvest of forest crops for commercial purposes. The Open Space Taxation Act allows property owners to have their open space, farm and agricultural, and timberlands valued at their current use rather than their highest and best use. See RCW 84.34 and Kittitas County Resolution 94-25 for category or categories of Open Space classification.

Shaded Fuel Break -- forested areas that are managed to reduce fire fuels on the forest floor and ladder fuels, which decreases the risk of a ground fire becoming a crown fire and provides time for fire suppression crews to control a fire before property is damaged.

Wildfire Hazard Severity Rating System -- a system for assessing the vulnerability of property to wildfire damage – Kittitas county Update at March 1999. The rating system also provides a point system to define the boundaries of defensible space around structures

Wildland/Urban Interface -- areas with relatively small land parcels, built up with recreational and residential homesites where naturally occurring forest vegetation becomes a fire risk in dry seasons and the level of fire protection is most often volunteer rural fire departments and in some cases DNR.

OTHER ABBREVIATIONS AND TERMS USED IN FORESTRY

Ac	Acre
BA	Basal Area (in square feet): area of ground occupied by trees
BA/Ac	Basal Area per Acre
BF	Board Feet
Cruising	The sample measurement of trees (usually in BF)
DBH	Diameter at Breast Height (of a tree): measure at 4.5' above the ground
DFL	Designated Forest Land: a tax status pursuant to RCW 84.33
DNR	Washington State Department of Natural Resources
DOE	Washington State Department of Ecology
FPA	Forest Practices Application (or Act)
HPA	Hydraulics Project Application
MBF	One Thousand Board Feet: "M" = 1,000 in forestry
OS-T	Open Space-Timber: a tax status pursuant to RCW 84.34
RMZ	Riparian Management Zone
RPI	Rings per Inch: the growth rings of a tree
R/W	Right-of-Way: such as a road or powerline
Scaling	The measurement of logs (usually in BF)
Scaling Rule	Refers to table or formula used to convert log measurements to BF. In Washington the Scribner Dec. C Scale Rule is used. The Eastern Washington Scale Rule is based on 20 foot maximum log segments (short log) and results in 15-20% more scale than the Western Washington Long Log Scale method.
SEPA	State Environmental Policy Act
Site	Growth potential of vegetation on an area of ground
Site Index	Measure of tree growth potential on a site
SMA	Shorelines Management Act
Spp	Species
Stand	A stand of trees or timber: similar to timber type or vegetation type
Stocking	Refers to number of trees, basal area, or volume per acre in a stand
TPA	Trees per Acre
USDA	United States Department of Agriculture
Vol	Volume: such as volume of timber (in MBF)
WDFW	Washington State Department of Fish & Wildlife
WFFA	Washington Farm Forestry Association
WMZ	Wetland Management Zone

Tree Species

Ce	Cedar: Western red cedar
CW	Cottonwood
DF	Douglas fir
GF	Grand fir: also called white fir
LLP	Lodgepole pine
PP	Ponderosa pine
WF	White fir – GF
WH	Western Hemlock
WWP	Western white pine

FACT SHEET

No. 04-178
May 26, 2004
Contact: Sandy Williams, 360-902-1114

Top 12 tips for wildfire prevention

Don't let your home become fuel for wildfire

The Department of Natural Resources (DNR) would like to offer ideas about how to protect your home from wildfire.

Here are some Firewise guidelines to make your home and landscape safer from fire:

- Remove pine needles and debris from your roof, gutters, and other collection areas around your home.
- Put a screen on your chimney.
- Maintain your yard - mow, weed, remove any dead vegetation.
- Prune trees and shrubs yearly.
- Trim tree limbs back 15 feet from your chimney.
- Move woodpiles 30 feet away from any structure.
- Remove combustible items from under decks and eaves.
- Ensure your address is visible and distinguishable from the street, both day and night.
- Driveways must be at least 12 feet wide and clear, with a minimum vertical, unobstructed clearance of 15 feet for a fire truck.

Landscaping can be a very effective tool for fire safety as well. Aesthetics need not be a tradeoff in designing a fire safe landscape. Here are some tips when installing or modifying your landscaping:

- Limiting vegetation around the home will create open access for firefighters to defend the home, and it will also reduce the amount of fuel that could ignite it.
- Think about using well-irrigated perennials near the home with non-flammable mulches like gravel or crushed rock.

- Water pools, pathways, birdbaths, seating (non-wood), or statuary are great additive features and, more importantly, become fire retardant elements.

To make your home more resistant to fire, visit www.firewise.org.

There are many websites to help you with your landscaping for fire safety. For more information on fire-resistant plants, visit http://extension.oregonstate.edu/deschutes/FireResPlants.pdf

In cleaning up around your home, DNR urges you to use caution regarding any outdoor burning. Debris burning is at the top of the list for human-caused wildfires. Know the laws, rules and regulations and get any necessary permits before you strike that match. For current burn ban information, call your local fire department or DNR's 1-800-323-BURN or visit http://www2.wadnr.gov/burn-risk/

# # #

RECCOMONDATION FOR FIRE SAFETY AND PREVENTION OF FOREST AND RANGE LAND IN KITTITAS COUNTY INCLUDING RURAL, COMMERCIAL, AND PRIVATE DEVELOPMENTS

Prepared and Recommended by:
Kittitas County Fire Prevention Co-op
Kittitas County Fire Chief's Association
Updated March 1999

Agencies Involved:
Boise Cascade Corp
Cle Elum Fire Dept
Dept. of Emergency Management
Ellensburg Building Dept.
Ellensburg Fire Dept.
Keep Washington Green Assn.,Inc.
Kittitas County Building & Fire Safety Dept.
Kittitas County Fire Districts
- KCFD #1, Thorp
- KCFD #2, Ellensburg
- KCFD #3, Easton
- KCFD #4, Vantage
- KCFD #51, Snoq. Pass.
- KCFD #6, Ronald/Lake Cle Elum
- KCFD #7, Upper Kittitas County
- KCFD #8, Lake Kachess
- KCFD #9, Kachess Ridge

Kittitas Fire Department
Murray Pacific Corp.
Plum Creek Timberlands
Roslyn Fire Dept.
South Cle Elum Fire Dept.
U.S. Forest Service
Washington Dept. of Natural Resources

I. Introduction

Wildfires annually cause considerable damage to natural resources, private and public properties and improvements on forest and rangelands in the State of Washington. In recent years, Kittitas County has experienced an influx of developments on these forest and range areas increasing the need for additional wildfire prevention. The degree of wildfire protection has not changed in the last ten (10) years. A number of developments have no structural fire protection.

Kittitas County has been identified by the State of Washington Department of Natural Resources as one of the areas in the state to be a high-risk area for potential extensive property loss. It is possible to identify and classify wildland vulnerability to these wildfire hazards. Appropriate consideration through development designs, maintenance, or regulations could minimize threats from wildfire.

This document serves as a general guide in identifying and classifying area wildfire hazards and provides recommendations, which may lead to additional regulations to lessen the impact to rural communities and private development from a potentially devastating wildfires.

II. Purpose

This report will assist local agencies, developers, property owners, and fire officials within Kittitas County by:

1. Identifying potential risks from wildfires to rural communities and developments.
2. Identifying the factors, which influence the severity of these risks.
3. Provide information and guidelines to minimize these risks.

- Fire Prevention-Those pre-suppression activities which prevent fire brands from being produced or coming into contact with sufficient fuel to result in a fire requiring suppression action.
- Fire Protection- Includes all the elements that are involved in maintaining Loss of Life, property and community consequences of fire to some acceptable level the community desires or can afford, Some of these broader aspects include: Prevention; Code development and enforcement, public education, public awareness and arson investigation. Control; Fire resistive construction and Hazard Isolation. Suppression; Automatic Suppression System and alarm devices, Manual Suppression Systems and investigations.
- Taken from Federal Emergency Management , National Fire Academy.

This document is composed of three main sections:

1. A system which can be applied to determine potential wildland fire hazard existing within site-specific areas of Kittitas County.
2. Indicates how the system can be used to lead a particular set of guidelines appropriate for each hazard rating.
3. Lists requirements and recommendations for the implementation of those guidelines.

III. **Classifying wildfire severity- a Wildfire Hazard Rating System**

As previously indicated each individual forest and rangeland development has its own degree of wildfire hazard severity. To determine this severity, Rural Fire Protection Districts with guidance from wildland protection agencies,(DNR & USFS) have incorporated the natural factors of wildland fuels (timber, brush), slope (steepness of ground), aspect (direction of the sun's exposure), and climate in to a "Wildfire Hazard Severity Rating System." These factors are combines into four separate risk groups: low, moderate, high and extreme. The ratings within these groups are based upon the relationship of various factors to the rate of fire spread and the difficulty of fire suppression.

Included in the rating system is fire protection services provided or not and response time in areas service is provided. The companion supporting documents details the evaluation process.

* The prevailing character of the area should govern the rating. Common sense discretion should be used to achieve a wildfire classification, which represents the general area.

IV. **Use of wildfire Hazard Rating System**

To use the wildfire hazard severity system, fire authorities and the Kittitas Fire County Fire Prevention Co-op rates the area under consideration by six (6) factors: lot size, fuels, aspect, climate and fire protection services. Then either add or subtract any of the applicable adjustment factors to arrive at a composite score. The composite score leads to an overall rating of low, moderate, high or extreme. This overall rating gives good indication of vulnerability of a development to potential wildfire property and life loss. This overall rating also keys the agency to the appropriate class of applicable development recommended guidelines.

* See attached Exhibit :A: for Wildfire Rating Sheet and adjustment factors.

V. Recommendation of Guidelines and Guideline Requirements

The recommended and required development guidelines include a number of different elements, each having recommendations for each severity rating. The recommended guidelines and requirements include the following:

1. Vegetative Clearance/ Defensible Space

Exposure to forest and brush fuels is primary hazards to structures. Under sever weather conditions, these fuels burn with intense heat and move rapidly. To reduce structural exposure to flames and radiant heat, and to give fire fighters a reasonable chance of saving structures, some minimum clearance requirements should be met.

Recommended & Required Guidelines on Vegetative Clearance

Description	Moderate	High	Extreme
A. Defensible Space*	50 Ft	50 Ft	50 Ft
B. Chimneys*	10 Ft	10 Ft	10 Ft
C. Dead Vegetation Uniform Fire Code Section 1103.2.4	Clear & Prune	Clear & Prune	Clean & Prune
D. Lot size KCC 16.12.090 KCC 17.56.030	½ acre	½ acre	1 acre
E. Roofs, valleys & gutters*	needle free	needle free	needle free

* Recommend the use of the Washington State Department of Natural Resources, Forest Stewardship Program, Eastern Washington Version as reference.

2. Structural Designs and Materials

Construction should be according to the Uniform Building Codes. There are additional fire safety requirements, which should be considered in sub divisions and developments with in Kittitas County

Required and Recommended Guidelines on Structural Design and Materials

Description	Moderate	High	Extreme
A. Roofs	Per KCC 14.12.030	same	same
B. Exteriors	Fire resistive	same	same
C. Projections	Fire resistive	same	same
D. Openings UBC Section 1505.3	Screened or Closed	same	same
E. Chimneys UFC Section 1109.7	Screened	same	same
F. Utilities KCC 16.12.110(b)	Underground	same	same
G. Sprinkler Systems Exterior/Lawn	Recommended	same	same
H. Interior Fire Fire Sprinklers	Recommended	same	same
I. Alarm Systems	Recommended	same	same

3. ***Road Specifications***

To provide for adequate fire control and prevention, subdivisions or other land developers shall provide for safe and ready access for fire and emergency equipment as well as providing an escape route for inhabitants, which will handle safety evacuation. To provide safe egress and access, road and street systems should be designed to provide maximum circulation consistent with topography and ground cover.

Kittitas County adopted Road Standards, KKC 12.04, August 2, 1994 which deal with all aspects of Roads with in Kittitas County. The Road Standards are as follows:

DRIVEWAYS, ACCESSES, WALKS AND TRAILS

12.30.10 Driveways and Accesses.

A. General

Driveway and Access use shall be defines as follows:

1. Driveway: Serves a single residential or commercial unit
2. Joint-use Driveway: Serves two residential or commercial units
3. Common Access: Serves three or four residential units. Only in rural areas.
4. Private Road: Serves a maximum of eight residential units. Only in rural areas.
5. Agriculture Access: Serves fields or outbuildings, not for residential or commercial access. Only allowed in rural areas.

Dimensions, slope and shall be designed as indicated on Kittitas County Standard Drawings, and as further specified in the following subsections. See section 12.20.150 for Entering Sight Distance requirements.

All new or revised accesses onto a County road require an approved County Access Permit

B. Conditions for Approval of New Driveways:

1. Driveways directly giving access onto arterials may be denied if alternate access is available.
2. All abandoned driveway areas on the same frontage shall be removed and the curbing and sidewalk, or shoulder and ditch section, shall be properly installed.
3. Maintenance of driveway approaches shall be the responsibility of the owner whose property they serve. The County will not maintain accesses.
4. For driveways crossing an open ditch section, culverts shall be 15 inches in diameter or larger, with tapered ends, is so required to carry anticipated storm water flows. The culvert type, diameter and length shall be required by the County and noted on the Access Permit.

C. *Access Requirements*

1. All new or revised accesses to County roads shall meet the following minimum requirements:

Type of Access	Potential Residential Units (a)	Minimum Surface Requirements	Timing of Requirements
Driveway	1	12' gravel surface	Prior to issuance of building occupancy permit
Joint-Use Driveway	2	20' easement 12' gravel surface	Prior to issuance of building occupancy permit.
Common Access	3 to 4	40' easement 22' gravel surface paved apron to County Road	Must be constructed within 12 months of final plat approval o acceptable guarante
Private Road (b)(c)	5 to 8	40' easement 22' paved to County Rd.	Must be constructed within 12 months of final plat approval o Acceptable guarant
Agricultural Access	-------	Follow requirements for "Driveway " shown abov	

Notes:

(a) Potential Residential Units is the maximum number of units permitted by zoning. If a proposal results in less than the maximum number of units allowed under current zoning, provisions must be made for future expansion of the access to potential lots.

(b) See requirements in Section 12.20.080. A 60 foot right-of-way may be required if a private can be extended in the future.

(c) When a new development proposes the use of an existing private road to serve more than 8 lots, the private road must be brought to County Standards by the developer.

2. On frontages of 75' or less, no more than one driveway per lot shall be constructed; on frontages over 75' and on local access roads, two or more driveways per lot may be permitted, subject to the approval of the Engineer.

3. No portion of the driveway width shall be allowed within 5' of property lines in residential areas or9' in commercial areas except for the joint-use Driveways, Common Accesses, and on cul-de-sac bulbs as necessary for proposed residential access.

4. Grade transitions, including the tie to the roadway, shall be constructed as smooth vertical curves. The maximum change in the driveway grade, within the right-of –way, shall be 8% within any 10 feet distance on a crest and 12% within any 10 feet of distance in a sag vertical curve. The driveway shall be graded so as to match into possible future widened road section without encroachment into the graded shoulder or sidewalk.. The design engineer for the proposes developments shall consider the access driveway profile when designing the serving road to ensure that grade transitions can be complied with considering building set back and lot terrain conditions.

D. Existing driveways may be reconstructed as they exist provided such reconstruction is compatible with the adjacent road.

Other Fire Safety Required and Recommended Road Specification Guidelines

A, Maximum Road Length at which an approved turnaround should be installed, 600 ft. per KCC 12.20.110 (A)
B. Turn around unpaved diameter,110 ft. Paved portion of cul-de-sac shall be 90 ft per KCC 12.20.11 (A)
C. Public Access shall be provided to each lot for the purpose of emergency vehicle access.
D. Radius of curves shall be per KCC 12.04
E. Identification shall be provided for all roads and residences per UFC 901.4.4 & 901.4.5
F. The maximum grade shall not exceed the maximum approved. UFC 902.2.2.6
G. All bridges and culverts shall be per KCC 12.04
H. Road Maintenance shall be provided by owner or owners association that the access serves.

4.Fire Fighting Water Supplies

All structural and wildland fire protection agencies have a basic need for adequate and reliable water supply. Factors which should be considered in the design of a water system are:

A. Lots size
   1. Lots less than three (3) acres , in short plat or cluster sub-division shall have fire flow provided: 1000 gal per min, 45 min. duration with residual of 20 psi. or other possible
   2. Lots greater than three(3) acres should have fire flow Provided 1000 gal per min., 45 min. duration with residual of 20 psi. or other possible

B. Ability to have separation from the domestic water systems.

C. Hydrant spacing per UFC Appendix III-B

D. Hydrant System per NFPA

E. The use of Fire Sprinklers to lower the required fire flow storage

F. Alternative Water Supplies for properties not falling within the required :
   1. Min. of 1000 gal. Storage with gas powered pump and hose to cover the acreage being protected.
   2. Pond or stream with constant water and proper gas pump and proper hose to cover the acreage being protected.
   3. Swimming pool with fire pump and proper hose to cover acreage being protected.

5. Solid Waste

All areas planned for development should have a suitable plan for the disposal of solid waste materials. Disposal of all solid wastes shall be in accordance with Kittitas County or Local Fire District Plans and or State of Washington. Kittitas County Solid Waste Department and its subcontractor provide sold waste service within Kittitas County.

5. *Fire Department Authority*

All areas planned for development shall lie within or be annexed into an existing Fire Protection District or make efforts to minimize wildfire dangers using the latest technologies via fire sprinklers, fire proof construction, while coming in to a contract situation with the closest Fire Protection District for fire protection and suppression efforts.

This summarizes the different application guidelines for the developments located in moderate, high or extreme wildfire hazard areas. Low rated areas do not require any unusual treatment but in the opinion of the Director of Building & Fire Safety if a danger exists, the danger will be dealt with on a site-specific details.

VI. Summary

Local agencies are encouraged to review this document and its supporting document and to consider its principles in their respective wildland development ordinances and codes.

The supporting document provides a considerable amount of detail regarding the development and application of each of the hazard type ratings as well as definitions for wildfire and planning terminology used in this publication.

The purpose of the Kittitas County Fire Prevention Co-op is to support the local agencies, developers, and landowners with information on factors, which influence wildfire behavior and categorize these factors into a "Wildfire Hazard Severity Rating System." Kittitas county Fire Prevention Co-op will provide recommended guidelines to assure a higher degree of protection from extensive damage in the face of wildfire.

Use of the previously discussed recommended and required guidelines may result in reduction of the damage to natural resources, property and improvements on our forest and range-lands.

This document is designed to be used for the primary purpose of development of new and future developments within Kittitas County.

Please note that these recommendations are to be addresses in another document dealing with current subdivisions and single house dwellings. Homeowners associations may want to incorporate some of these recommendations whenever it is appropriate and necessary.

Exhibit "A"

WILDFIRE HAZARD SEVERITY RATING

HAZARD GROUP	I LOW 1 - 3 Pts	II MODERATE 4 - 6 Pts	III HIGH 7 - 9 Pts	IV EXTREME 10 - 12 Pts	POINTS
Fuels (Resistant to Control)	Fuels are sparse to continuous but usually less than 18" in height and fine in texture. Also, isolated trees and shrubs of low burning intensity when green. Examples include but are not limited to grasses, low brush, alpine meadows, deciduous trees, widely scattered conifer wet-area vegetation or dryline crops. _____	Fuels are pure conifer/hardwood stands or brush species of medium density and moderate burning intensity. Tree crowns are close together but ground beneath usually not shaded. May also include stands of dense conifer reproduction up to 10 feet tall or stands of older trees with little understory vegetation. _____	Fuels are pure conifer or conifer/hardwood stands of high density; light slash; conifer species with heavy brush understory. Tree crowns extend to the ground and nearly all of the ground is shaded throughout most of the day. _____	Within or adjacent to heavy logging slash, dead standing trees, windthrown timber or stands of overmature trees with dead tops. Also includes dense brush with very high burning intensity, such as gorse, manzanita, and scrub oak-grass types. _____	_____
Slope	0-5% _____	6-20% _____	21-40% _____	41+% _____	_____
Aspect	North _____	East _____	West _____	South _____	_____
Climate	Low Less than 25% of the days are classified as moderate or higher fire danger. _____	Moderate 26-60% of the days are classified as moderate or higher fire danger. _____	High More than 60% of the days are classified as moderate or high fire with an occasional extreme fire danger rating. _____	Extreme Forest fire danger is generally high with frequent days (10% or more) of extreme fire danger. _____	_____
Fire Protection Services	Within established wildfire protection agency jurisdiction and less than 30 minutes response time. _____	Within established wildfire protection agency jurisdiction and more than 30 minutes response time. _____	Outside established wildfire protection agency jurisdiction and less than 30 minutes response time. _____	Outside established wildfire protection agency jurisdiction and more than 30 minutes response time. _____	_____

TOTAL POINTS _____

WILDFIRE HAZARD SEVERITY ADJUSTMENT FACTORS ON FOLLOWING PAGE

(Continuation of Exhibit "A")

Total Pts. From
Previous Page _____

Adjustment Factors

1. Slope – add 2 points for rough topography that contains several canyons. _____
2. Climate – add 4 points for areas that are periodically exposed to unusually severe fire weather such as strong east winds. _____
3. Fuels – Subtract 3 points for existing areas where fuel modification and/ or fuel provide usable fire control points and/or protection to structures _____
4. Fire Protection Services- subtract 3 points for areas where local facilities Such developed water systems, fire trucks, dozers, or local organizations Provide additional protection to structures or forestland. _____
5. Fire Occurrence – add 3 points for areas that have a higher history of fire occurrence than surrounding areas due to special situations such as heavy lightning area, railroads, escaped debris burning, arson, etc. Local fire protection authorities can provide this information. _____
6. Internal Fire Sprinkler System – subtract 3 points _____
7. External underground lawn sprinkler system – subtract 1 point _____

Grand Total _____

Overall Wildfire Hazard Rating for MPR

Overall Points	Defensible space distance from Structure
Low = 0-15 points	10 feet
Moderate = 15-30 points	20 feet
High = 30 – 45 points	25 feet
Extreme = 45 + points	30 feet plus

Note:

Wildland protection agencies such as State or Federal Forestry Services provide wildland protection only and not structure protection. Rural Fire Districts provide structural protection and wild land protection. The reader is advised to contact local fire protection organizations to determine the protection status of his/her vicinity

Kittitas County Noxious Weed Control Board
507 Nanum Street, Room 26, Ellensburg, WA 98926
Telephone: (509) 962-7007 / Fax: (509) 962-7033 / Email: weeds@co.kittitas.wa.us
Board of Directors: Holly Pinkart, Bud Dyk, Mary Morgan, Steve Burris, and Jim Hanson

2006 KITTITAS COUNTY NOXIOUS WEED CONTROL BOARD POLICY STATEMENT

It is the responsibility of the Kittitas County Noxious Weed Control Board to protect and preserve the agricultural, recreational, wildlife habitat, and natural areas of Kittitas County from the degrading impact of exotic and invasive noxious weeds. A noxious weed is legally defined in RCW 17.10 as "...a plant that when established is highly destructive, competitive, or difficult to control by agricultural or chemical practices."

Noxious weed control has long been associated with the protection of rangeland and cropland. Costing an estimated 24% of the state's gross agricultural product, noxious weeds are a justifiable concern. Recently, concerns over the loss of native ecosystems, fish and wildlife habitat, and recreational areas have raised additional support for noxious weed control.

It is hoped that voluntary compliance of weed control can be achieved by enhancing public awareness through education. The Kittitas County Noxious Weed Control Board has many publications on noxious weeds available to the public as well as backpack sprayers that are made available to landowners as a free public service. Weed Board staff and Cooperative Extension agents are also available to give recommendations and advice on weed control procedures.

According to state law and RCW 17.10 it is the landowners' responsibility to control noxious weeds on their land. If voluntary compliance to RCW 17.10 is not established a notice of the infestation is sent to the landowner. The landowner must demonstrate a concerted and good faith effort in controlling the noxious weed infestation. It is not the desire of the Weed Board to enforce on the landowner. Enforcement proceedings will only be implemented if the landowner does not comply with RCW 17.10 in controlling noxious weed infestations on their property.

In order to control and eradicate noxious weeds in Kittitas County everyone must work together. We are beginning to make significant progress and it is our hope that we can make this another successful year in weed control. We thank you for your support in the past and we are looking forward to working with you in the future. If you have any questions or comments please feel free to contact The Kittitas County Noxious Weed Control Board at (509) 962-7007 or visit our website at

The noxious weed list of the Kittitas County Noxious Weed Control Board (RCW 17.10.090) is comprised of all Class A and Class B noxious weeds listed on The Washington State Noxious Weed Control Board's noxious weed list (WAC 16-750) and the Class C weeds designated for control by the Kittitas County Noxious Weed Control Board. The following noxious weeds are required to be controlled in Kittitas County as mandated by RCW 17.10.

See the reverse side of this page for a complete list of noxious weeds required to be controlled in Kittitas County.

2006 KITTITAS COUNTY NOXIOUS WEED LIST			
Common Name	Scientific Name	Common Name	Scientific Name
CLASS A NOXIOUS WEEDS		CLASS B NOXIOUS WEEDS	
Bean-caper, Syrian	*Zygophyllum fabago*	Arrowhead, grass-leaved	*Sagittaria graminea*
Blueweed, Texas	*Helianthus ciliaris*	Alyssum, hoary	*Berteroa incana*
Broom, Spanish	*Spartium junceum*	Blackgrass	*Alopecurus myosuroides*
Buffalobur	*Solanum rostratum*	Blueweed	*Echium vulgare*
Clary, meadow	*Salvia pratensis*	Broom, Scotch	*Cytisus scoparius*
Cordgrass, salt meadow	*Spartina patens*	Bryony, white	*Bryonia alba*
Cordgrass, denseflower	*Spartina densiflora*	Bugloss, annual	*Anchusa arvensis*
Crupina, common	*Crupina vulgaris*	Bugloss, common	*Anchusa officinalis*
Flax, spurge	*Thymelaea passerina*	Camelthorn	*Alhagi maurorum*
Floating primrose-willow	*Ludwigia peploides*	Carrot, wild	*Daucus carota*
Four o'clock, wild	*Mirabilis nyctaginea*	Catsear, common	*Hypochaeris radicata*
Goatsrue	*Galega officinalis*	Chervil, wild	*Anthriscus sylvestris*
Hawkweed, yellow devil	*Hieracium floribundum*	Cinquefoil, sulfur	*Potentilla recta*
Hogweed, giant	*Heracleum mantegazzianum*	Cordgrass, common	*Spartina anglica*
Hydrilla	*Hydrilla verticillata*	Cordgrass, smooth	*Spartina alterniflora*
Johnsongrass	*Sorghum halepense*	Daisy, oxeye	*Leucanthemum vulgare*
Knapweed, bighead	*Centaurea macrocephala*	Elodea, Brazilian	*Egeria dense*
Knapweed, Vochin	*Centaurea nigrescens*	Fanwort	*Cabomba caroliniana*
Kudzu	*Pueraria montana*	Fieldcress, Austrian	*Rorripa austriaca*
Lawnweed	*Solvia sessilis*	Floating heart, Yellow	*Nymphoides peltata*
Mustard, garlic	*Alliaria petiolata*	Gorse	*Ulex europaeus*
Nightshade, silverleaf	*Solanum elaegnifolium*	Hawkweed, mouseear	*Hieracium pilosella*
Reed sweetgrass	*Glyceria maxima*	Hawkweed, orange	*Hieracium aurantiacum*
Sage, clary	*Salvia sclarea*	Hawkweed, polar	*Hieracium atratum*
Sage, Mediterranean	*Salvia aethiopis*	Hawkweed, queendevil	*Hieracium glomeratum*
Spurge, eggleaf	*Euphorbia oblongata*	Hawkweed, smooth	*Hieracium laevigatum*
Starthistle, purple	*Centaurea calcitrapa*	Hawkweed, yellow	*Hieracium caespitosum*
Thistle, Italian	*Carduus pycnocephalus*	Hedgeparsley	*Torilis arvensis*
Thistle, milk	*Silybum marianum*	Helmet, policeman's	*Impatiens glandulifera*
Thistle, slenderflower	*Carduus tenuiflorus*	Herb-Robert	*Geranium robertianum*
Velvetleaf	*Abutilon theophrasti*	Houndstongue	*Cynoglossum officinale*
Woad, dyers	*Isatis tinctoria*	Indigobush	*Amorpha fruticosa*
		Knapweed, black	*Centaurea nigra*
CLASS C NOXIOUS WEEDS		Knapweed, brown	*Centaurea jacea*
Babysbreath	*Gypsophila paniculata*	Knapweed, diffuse	*Centaurea diffusa*
Bindweed, field	*Convolvulus arvensis*	Knapweed, meadow	*Centaurea pratensis*
Cockle, white	*Silene latifolia*	Knapweed, Russian	*Acroptilon repens*
Cocklebur, spiny	*Xanthium spinosum*	Knapweed, spotted	*Centaurea maculosa*
Cress, hoary	*Cardaria draba*	Knotweed, Bohemian	*Polygonum bohemicum*
Dodder	*Cuscuta approximata*	Knotweed, giant	*Polygonum sachalinense*
Goatgrass, jointed	*Aegilops cylindrica*	Knotweed, Himalayan	*Polygonum polystachyum*
Groundsel, common	*Senecio vulgaris*	Knotweed, Japanese	*Polygonum cuspidatum*
Hawkweed, non-native	*Hieracium spp.*	Kochia	*Kochia scoparia*
Henbane, black	*Hyoscyamus niger*	Lepyrodiclis	*Lepyrodiclis holosteoides*
Iris, yellow flag	*Iris pseudocorus*	Loosestrife, garden	*Lysimachia vulgaris*
Mayweed, scentless	*Matricaria perforata*	Loosestrife, purple	*Lythrum salicaria*
Old man's beard	*Clematis vitalba*	Loosestrife, wand	*Lythrum virgatum*
Poison-hemlock	*Conium maculatum*	Nutsedge, yellow	*Cyperus esculentus*
Reed, common, non-native	*Phragmites australis*	Oxtongue hawkweed	*Picris hieracioides*
Spikeweed	*Hemizonia pungens*	Parrotfeather	*Myriophyllum aquaticum*
St. Johnswort, common	*Hypericum perforatum*	Pepperweed, perennial	*Lepidium latifolium*
Tansy, common	*Tanacetum vulgare*	Primrose, water	*Ludwigia hexapetala*
Thistle, bull	*Cirsium vulgare*	Puncturevine	*Tribulus terrestris*
Thistle, Canada	*Cirsium arvense*	Ragwort, Tansy	*Senecio jacobaea*
Toadflax, yellow	*Linaria vulgaris*	Saltcedar	*Tamarix ramosissima*
Water lily, fragrant	*Nymphaea odorata*	Sandbur, longspine	*Cenchrus longispinus*
Whitetop, hairy	*Cardaria pubescens*	Skeletonweed, rush	*Chondrilla juncea*
Wormwood, absinth	*Artemisia absinthium*	Sowthistle, perenial	*Sonchus arvensis*
		Spurge, leafy	*Euphorbia esula*
		Spurge, myrtle	*Euphorbia myrsinites L.*
		Starthistle, yellow	*Centaurea solstitialis*
		Swainsonpea	*Sphaerophysa salsula*
		Thistle, musk	*Carduus nutans*
		Thistle, plumeless	*Carduus acanthoides*
		Thistle, Scotch	*Onopordum acanthium*
		Toadflax, Dalmatian	*Linaria dalmatica*
		Watermilfoil, Eurasian	*Myriophyllum spicatum*

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 2006 Washington State Noxious Weed List (WAC 16-750) and the Class C weeds listed above

highlight indicates known presence in Kittitas County

If you are aware of the presence of any noxious weeds that are not highlighted in this list, contact the Weed Board

Insect and Disease Occurrences in Ponderosa Pine and Mixed Conifer Forests Cle Elum and Roslyn Areas of Central Washington

Introduction

There are a wide range of forest insects and disease occurrences common to this area. They include root diseases within the soil, bark beetles, mistletoes, stem rots and decays, and bark beetles. The most frequent causes of tree mortality in this area are root diseases and bark beetles.

History

Upper Kittitas County Pine and mixed conifer stands are similar in age and structure throughout the lower elevation east slopes of the Cascades. Historically, the forest species composition and structure was strongly influenced by regular, low intensity ground fires. This resulted in relatively open, park like stands dominated by large diameter ponderosa pine, western larch and Douglas fir.

Beginning in the late 19th and early 20th century the combination of periodic partial cut harvest entries combined with fire exclusion began to "change" the forests once dominated by widely spaced pine to more dense stands. In many cases the more shade tolerant Douglas fir and grand fir became dominant. The dense forest created a condition where trees were competing with each other for moisture and then in periods of dry years they become stressed and more susceptible to mortality from endemic root diseases and insect populations.

Root diseases and bark beetles kill weak trees more readily than strong vigorous trees. The resulting change in forest structure has in turn changed wildlife habitat conditions and created heavy accumulations of forest fuels. This is the current situation on many sites in upper Kittitas County.

Root Diseases

Research has confirmed that these 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 with 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, or hazelnut which has responded to more sunlight reaching the forest floor.

Phil Hess 4/21/03

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 with 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.

Management Recommendations

Host species vary in their susceptibility but all coniferous species are moderately to highly susceptible until they are 12 to 15 years old. After this age, some species become less susceptible to mortality especially ponderosa pine and western larch. Choosing to manage for pine and larch is a logical management option in most root rot areas if conifer production is the goal.

In urban forest areas that may be built up it is a good idea to manage for broadleaf species such as aspen, paper birch, poplar, vine maple or oceanspray. Another alternative for root rot pockets is to create a small forest opening planted to grass, wildflowers and native shrubs. This effectively deals with the root rot problem and at the same time creates wildlife habitat diversity.

Bark Beetles

There are three major groups of beetles common to upper Kittitas County, and they like root diseases, 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.

2) Western Pine Beetle (WPB) will most likely attack large, old ponderosa pine with low vigor. They make winding, criss-crossing egg galleries under the bark of trees.

3) *Ips* beetles utilize dead trees of pine, logging slash, pre-commercial thinning slash, windthrow, or portions of trees, which have been damaged by drought. Their egg galleries radiate out from a central chamber under the bark of trees.

The life cycles and predisposing agents of each vary somewhat as well as the number of generations per year. All life cycles include egg, larvae, pupa and adult stages. However, it is safe to say that trees under stress from drought or root rots are going to be more susceptible.

Management recommendations

The most important weapons for preventing successful bark beetle attacks are the health of the trees themselves. When trees are vigorous and healthy they will defend themselves against insect attacks.

The latest epidemic attack in upper Kittitas County occurred in the late 1980's and early 1990's. The result of this catastrophic MPB event is still apparent in many areas as evidenced by concentrations of dead pine on the forest floor.

In 1988 the University of Washington conducted a MPB study in the Cle Elum/Roslyn area which has been valuable for forest managers to understand the best ways to prevent future attacks. Following is a summary of this report:

Ponderosa Pine Thinning to Reduce Risk of Pine Bark Beetle Mortality
During Drought Periods and related Mountain Pine Beetle (MPB) Population Increases

This is a summary of the recommendations from the early 1990's study and report conducted by David R. Braun and Robert I. Gara from the U of W in the Cle Elum/Roslyn area.

The study involves the relationship of drought, tree spacing, tree density, tree diameter, and basal area characteristics in the typical 60 to 80 year old pine stands common to the area.

Abbreviations and examples

MPB – Mountain Pine Beetle
BA/acre – Basal Area per Acre as measured in Square Feet
SF – Square Feet
TPA – Trees per acre
DBH -- Diameter Breast Height measured in inches (this is the point where BA is measured)
Tree spacing or Density – Stem spacing measured in feet.

For example: a 18" DBH tree is 1.767 SF and if average spacing is 20x20 then
Average TPA is 109 $\frac{(43,560)}{20 \times 20} = 109$ TPA
and the average BA/acre is 109 x 1.767 = 193 SF BA/acre

and the average BA/acre is 109 x 1.767 = 193 SF BA/acre

Key Points from Braun and Gara

3) Typical, unthinned > 60 year old PP stands may have a about 173 SF of BA/ acre.

4) During 1988, and following 2 years of drought MPB populations increased steeply in this area.
5) Water stress greatly reduces the defense mechanisms of ponderosa pine.

6) The frequency and intensity of MPB outbreaks can be reduce by tree thinning.

7) Studies have shown that thinning to BA/acre targets is recommended. This will vary by area and site.

8) Thinning ponderosa pine stands will both prevent MPB outbreaks and stop the spread of spots.

9) This study and others have shown that > 60-year-old stands approaching 175-200 SF of BA per acre are susceptible to MPB caused mortality.

10)These stands when thinned to < 100 SF of BA per acre are free of damage.

References:

Braun, David R. and Robert I. Gara. 1988. The Host Selection Behavior of the Mountain Pine Beetle in Central Washington State. College of Forest Resources, AR-10, University of Washington, Seattle, WA 98195.

Omdal, Dan. 1999. Washington State, DNR Forest Pathologist. Personal Written Communication.

Vegetation Beneficial to Wildlife as a Food Source

Forbs and Grasses:

creeping Oregon grape (*Berberis repens*)
clover * (*Trifolium spp.*)
twinflower (*Lennaea borealis*)
bluegrass (*Poa spp.*)
bluebunch wheatgrass (*Agropyron spicatum*)
elk sedge (*Carex geyeri*)
orchard grass (*Dactylis glomerata*)
Idaho fescue (*Festuca idahoensis*)
needlegrass (*Stipa spp.*)
timothy * (*Phleum pratense*)
beargrass (*Xerophyllum tenax*)

Shrubs:

rocky mountain maple (*Acer glabrum*)
serviceberry (*Amelanchier alnifolia*)
bearberry (*Arctostaphylos uva-ursi*)
bog birch or swamp birch (*Betula glandulosa*)
redstem ceanothus (*Ceanothus sanguineus*)
evergreen ceanothus (*Ceanothus velutinus*)
red-osier dogwood (*Cornus stolonifera*)
black hawthorn (*Crateagus douglasii*)
Labrador tea (*Ledum glandulosum*)
chokecherry (*Prunus spp.*)
currant (*Ribes spp.*)
wild rose (*Rosa spp.*)
western thimbleberry (*Rubus parviflorus*)
elderberry (*Sambucus spp.*)
mountain ash (*Sorbus spp.*)
huckleberry (*Vaccinium spp.*)
grouseberry (*Vaccinium scoparium*)
raspberry and blackberry (*Rubus spp.*)
snowberry (*Symphoricarpos spp.*)

Trees:

paper birch (*Betula papyrifera*)
trembling aspen (*Populus tremuloides*)
willows (*Salix spp.*)
western red cedar (*Thuja plicata*)
apple trees * (*Malus spp.*)
grand fir (*Abies grandis*)
subalpine fir (*Abies lasiocarpa*)
whitebark pine (cones) (*Pinus albicaulis*)
ponderosa pine (cones) (*Pinus ponderosa*)
Douglas-fir (cones) (*Pseudotsuga menziesii*)
pacific yew (*Taxus brevifolia*)
Russian olive * (*Elaeagnus angustifolia*)

Mushrooms

Some cavity-nesting species in the Pacific Northwest

Species	Minimum dbh (inches)	Minimum height (feet)	Type of Cavity Use	Major Plant Community	Major Successional Stages
Black-capped chickadee *Parus atricapillus*	4	6	B, C, D	B, C	C - F
Mountain chickadee *Parus gambeli*	4	6	B, C, D	A, D - H	C - F
Chestnut-backed chickadee *Parus rufescens*	4	6	B, C, D	E, F, G	C - F
Downy woodpecker *Dendrocopos pubescens*	6	15	A, B	B, C	D, E, F
Hairy woodpecker *Dendrocopos villosus*	10	15	A	D - H	D, E, F
Tree swallow *Iridoprocne bicolor*	10	15	C	B - E	A, B, D - F
Brown creeper *Certhia familiaris*	10	15	D, E	C, D, E	D, E, F
Mountain bluebird *Sialia currucoides*	10	6	C, D	A, B, D, E	A, B, D - F
Short-tailed weasel *Mustela erminea*	10	6	C, D	C, E - H	ALL
American kestrel *Falco sparverius*	12	15	C, D	A - E	A, B, D - F
Pygmy owl *Glaucidium gnoma*	12	30	C, D	A - E	ALL
Common flicker *Colaptes auratus*	12	6	A, C, D	A - F	ALL
Red-breasted nuthatch *Sitta canadensis*	12	15	B, C	E, F, G	D, E, F
Big brown bat *Eptesicus fuscus*	12	15	C, D, E	ALL	ALL
Pine (red) squirrel *Tamiasciurus hudsonicus*	12	15	C, D	C - H	C - F
Marten *Martes americana*	15	15	C, D	E - H	C - F
Common merganser *Mergus merganser*	20	6	D	A - D	ALL
Barred owl *Strix varia*	20	30	D	C - F	A, B, E, F
Pileated woodpecker *Dryocopus pileatus*	20	31 +	A	D, E, F	E, F
Fisher *Martes pennanti*	20	30	D	C, E - H	C - F

Type of cavities the animal uses:

A = Primary excavator in hard snags
B = Primary excavator in soft snags
C = Cavity used created by another species
D = Natural cavities
E = Occupies space under the bark

Plant community the animal is found in:

A = western juniper
B = quaking (trembling) aspen
C = riparian (cottonwood)
D = ponderosa pine
E = mixed conifer
F = grand fir
G = lodgepole pine

Successional stages the animal uses:

A = grass - forb
B = shrub - seedling
C = pole sapling
D = young
E = mature
F = old growth

Thomas et al. 1979.

Facts about Cavity-nesting Birds

WOOD DUCK: Inhabits woodland streams and ponds during summer; not common in urban areas. Nest is a bare cavity, lined with down. Lays 8-10 white or creamy eggs.

AMERICAN KESTREL: Inhabits open areas with scattered trees; not common in urban areas. Nest is a shallow scrape in a cavity. Lays 4-5 mostly-white eggs. Eats rodents and insects.

BARN OWL: Uses a variety of habitats. Nest is a shallow hollow in a cavity. Lays 4-7 white eggs. Eats rodents.

SCREECH OWL: Widely distributed in forests, parks, orchards and woodlots. Nest is an unlined tree cavity. Lays 4-5 white eggs. Eats rodents.

NORTHERN FLICKER: Lives in open or sparsely wooded areas. Nest cavity is usually excavated in live wood. Lays 5-8 glossy white eggs. Eats insects, especially ants.

HAIRY WOODPECKER: Inhabits mature woodlands, especially deciduous forests; uncommon in urban areas. Nest cavity is usually excavated in live wood. Usually lays 4 glossy white eggs. Eats insects.

DOWNY WOODPECKER: Inhabits open woodlands and natural parks; more common than hairy woodpecker in urban areas. Nest cavity is usually in dead wood. Lays 4-5 glossy-white eggs. Eats insects.

VIOLET-GREEN SWALLOW: Common in urban areas during the summer. Nest is a cup of dry grasses lined with feathers and fine materials placed in a crevice in buildings, old woodpecker holes or bird houses. Lays 4-5 white eggs. Eats flying insects.

TREE SWALLOW: Widely distributed in summer, usually near water. Less common than violet-green swallow in urban areas. Nest is a cup of grasses lined with feathers in a natural cavity, old woodpecker hole or a crevice in a building. Lays 4-6 white eggs. Eats flying insects.

PURPLE MARTIN: Widely distributed in summer, in past near human settlements, but now rare in the state due to habitat losses and competition from house sparrows and starlings for nest sites. Nest is placed in crevices in rocks, trees or buildings, or in old woodpecker holes. Lays 4-5 white eggs. Eats flying insects.

CHESTNUT-BACKED CHICKADEE: Inhabits coniferous forests. Nest is made of moss, with a cup of fur, feathers and fibers. Lays 6-7 white eggs, sometimes speckled. Eats insects in summer, seeds in winter.

BLACK-CAPPED CHICKADEE: Inhabits open areas with scattered trees; common in urban areas. Nest and diet similar to chestnut-backed chickadee. Lays 6-8 white creamy eggs.

RED-BREASTED NUTHATCH: Found in mixed forests; not common in urban areas. Nest is a cavity in dead wood, with a cup of grasses, rootlets and fur. Tree resin is smeared around the entrance hole. Lays 5-6 white or creamy eggs, usually speckled. Eats insects and seeds.

HOUSE WREN: Widely distributed in areas with shrubby cover; uncommon summer resident in urban areas. Nests in any cavity, including the pockets of pants hanging on a clothesline. Lays 6-8 white, finely speckled eggs. Eats insects.

BEWICK'S WREN: Inhabits open woodlands and thickets. Nest is a bulky cup in any cavity. Lays 5-7 white eggs, often speckled. Eats insects.

WESTERN BLUEBIRD: Inhabits woodland clearings and open areas; rare in urban areas. Nest is a slight cup in a cavity, made of dry grasses and a few feathers. Lays 4-6 blue eggs. Suffers from loss of habitat and competition for nest sites from starlings.