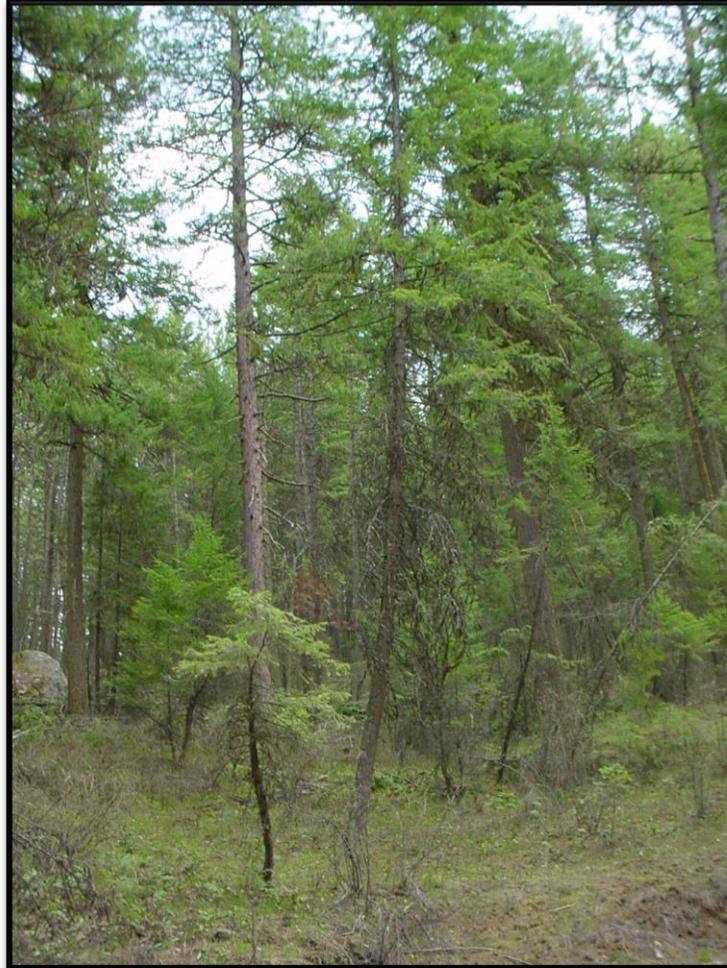


Silver Beach Homes Inc. Forest Stewardship Plan Update



August 2013
15 West Crawford
Deer Park, WA 99006
www.consulting-foresters.com

Prepared By: Luke Machtolf, CF and John A. Erixson ACF

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Landowner Information

Silver Beach Homes Inc.
Patricia Coats, President
44039 Silver Beach Road
PO Box 333
Loon Lake, WA 99148

Property Information

The Silver Beach Homeowners' Association property consists of 63.24 acres in Stevens County, Washington. The following table shows legal description, parcel number and size by acre.

Legal Description	Parcel Number	Acreage
Portions of NESE and SENE, excluding the platted parcels in Section 4, T29N, R41E, W.M.	5174400	63.24

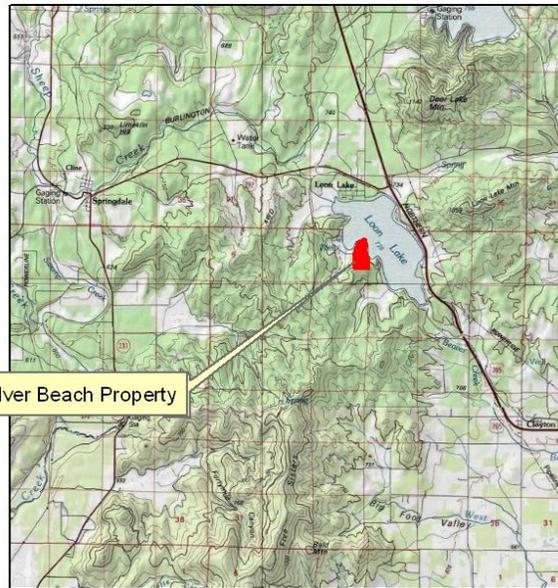
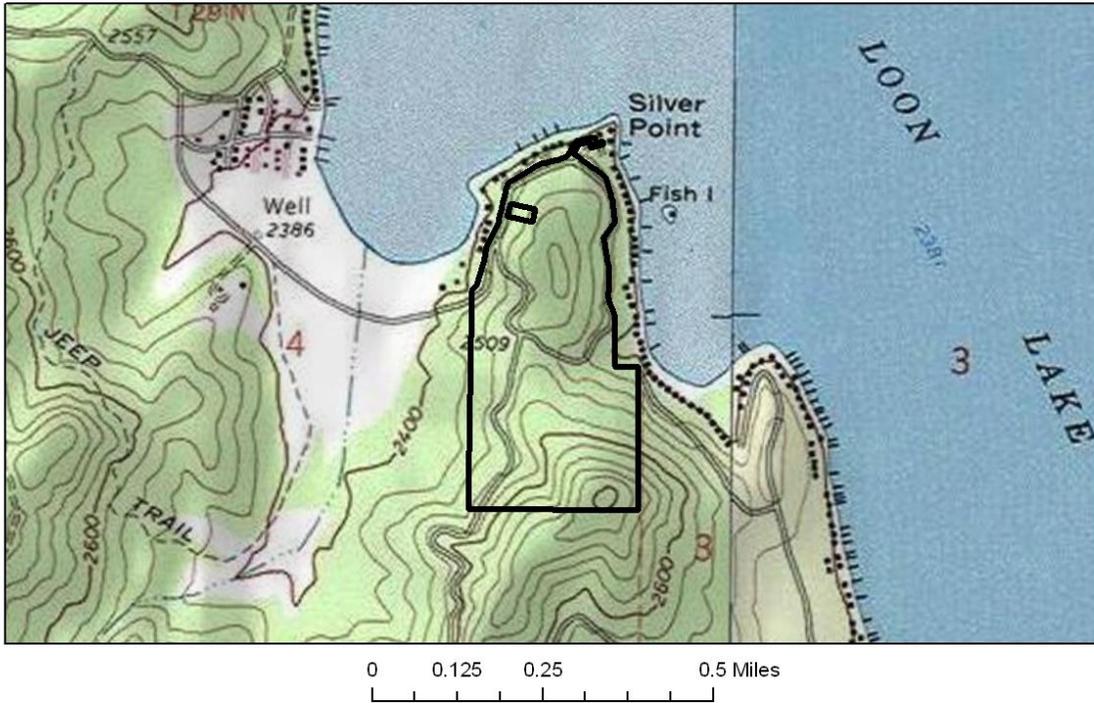
To access the property from Deer Park, travel 7.8 miles north on US Highway 395 to Larson Beach Road. Turn left and continue 0.7 miles, continue onto South Loon Lake Road 2 miles to Loon Lake Southside Road. The Silver Beach property is located on the west side of Loon Lake on a prominent peninsula extending north from the west shore.

Landowner Objectives

The objectives for management of the property have been identified as follows:

- 1. Responsible stewardship based on long-term ownership and sound forest management.**
- 2. Maintain a high aesthetic value throughout the property.**
- 3. Develop and maintain a healthy and vigorous forest.**
- 4. Through good stewardship and sound forest management provide optimum habitat for many different wildlife species.**
- 5. Reduce the risk from wildfire in all areas of the property.**
- 6. Return non-productive timberlands to timber production.**

Silver Beach Property
 T29N, R41E, WM
 Stevens Co., Washington



Map Made By:
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Introductory Overview of the Property

Introduction

Typically, the long term goal of forest management is to develop and maintain a well balanced and healthy ecosystem while meeting the landowner's objectives for the property. Although this plan identifies recommended treatments, the recommendations are flexible. Changing landowner needs, markets, environmental conditions, or regulatory laws may require alterations of the schedules or treatments. A forest management plan serves as the basis for developing stand treatments that consider not only the timber resource, but also wildlife habitat, soils, noxious weeds, sensitive species, cultural factors and other resource values as define by the landowner. This plan will provide the landowner with guidelines on the timing of treatments as well as alternative management actions.

Silver Beach Homes Inc. owns 63.24 acres along the shore of Loon Lake. The property lies near Silver Point on the south shore of Loon Lake, and is primarily used for residential and recreational cabins along the shore line. Significant private and public forestlands exist to the south, east and west of the property. Forest production for the area is moderate.

To date, the only forest management activity completed by the current owners has been a commercial thin/ salvage operation in stand 1 and parts of stand 2. Stand 3 and 4 have had limited activity over the past several years.

Topography

The Silver Beach Homes Inc. property is gentle with slopes ranging from 0% to 50% with an average slope of 30%. The majority of the property has an east or west aspect, with some north aspects near the lake and cabin area. The area near the cabins and lake is fairly steep and slopes down towards the water. A prominent ridge runs through the center of the property; this area is defined by rolling topography with slopes from 10 to 30%. Slopes increase as you get closer to the south property line and below the road. The steepest portion of the property is in the southwest corner with an average slope of 50%. The elevation ranges between 2,400 and 2,750 feet.

Access

The subject property has a gravel county road running through the west portion of the property.

To access the property from Deer Park, travel 7.8 miles north on US Highway 395 to Larson Beach Road. Turn left and continue 0.7 miles, continue onto South Loon Lake Road 2 miles to Loon Lake Southside Road to the property. The Silver Beach property is located on the west side of Loon Lake on a prominent peninsula extending north from the west shore.

Weather

The approximate average annual precipitation is 21 inches and the average annual air temperature is approximately 46 degrees Fahrenheit. The frost-free season ranges from approximately 105 to 125 days.

Silver Beach Property
T29N, R41E, WM
Stevens Co., Washington



Map Made By:
Northwest Management Inc.
15 W. Crawford
Deer Park, WA 99006-1103
(509) 276-4699
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0 0.05 0.1 0.2 Miles



General Vegetation and Habitat Type

The most common tree species on the Silver Beach Homes Inc. property include lodgepole pine, ponderosa pine, Douglas-fir, western larch, and grand fir. Species composition varies across the property depending on past management actions, slope/aspect and other site conditions. Non-conifer understory vegetation includes but is not limited to snowberry, mallow ninebark, ocean spray and Rocky Mountain maple. Grasses found on the property include but are not limited to pine grass, orchard grass and fescues.

Resource Category I – Forest Health/Wildfire/Invasive Species

Forest Health - Overview

A brief description of the forest pathogens is provided in the next few paragraphs. More detail is provided under each header for the specific pathogen.

A healthy forest is:

- 1) Resilient to natural and human disturbance;
- 2) Biologically diverse;
- 3) Able to provide a sustained habitat for vegetation, wildlife and humans.

Forest Health

Several forest health issues are present in each of the stands. The most damaging is the presence of root disease in some of the Douglas-fir and grand fir. Another common problem is dwarf mistletoe (DM), observed in Douglas-fir, western larch and ponderosa pine. Each of these pathogens pose different levels of concern for this property.

Root disease is a threat to each of the stands as evidenced by dead and dying timber as well as the thinning crowns in both Douglas-fir and grand fir. Corrective measures incorporate a long-term strategy that entails a shift in the overstory species away from species susceptible to the disease to more resilient species. Douglas-fir and grand fir should be selected as the cut trees in the stands, leaving the healthy ponderosa pine where possible. Planting ponderosa pine, western white pine and western larch is recommended in the areas with root disease. The immediate risk associated with the root disease is the loss in commercial value of dead and dying trees, as well as safety risks associated with falling trees. A goal to salvage the dead and dying trees that exhibit evidence of root disease should be considered within the next few years in order to capture the commercial value of these trees. Mistletoe will require removal of the infected trees in order to avoid transmission of the parasitic plant (DM) from the large trees to the smaller trees. Additional corrective measures can be implemented in the stand to reduce the effect on younger trees, including pruning or removal of infected limbs. Stands with significant mistletoe problems should have a sanitation harvest planned that should focus on removing heavily infected trees. After the sanitation harvest is completed, an aggressive pruning program can reduce the occurrence of dwarf mistletoe. Eradication is not likely but control of the problem is possible.

Some other problems observed in the stands include mechanical wounds (potentially leading to increased susceptibility to root rot) and various forms of defect, including forked tops, sweep and crooks

(most commonly observed in stand 4). While each of the problems does reduce the overall quality and value of the trees, none pose a significant risk to the stands.

Stocking Level

Trees require adequate light, water and nutrients to maintain their health and grow to their biologic potential. If one or more of these elements are missing or insufficient, the tree experiences stress. Stressed trees are more vulnerable to insect pests, disease problems and reduced growth rates.

The abundance of sunlight in the forest is managed by controlling the number, size and density of trees. The optimal amount of sunlight varies with tree species present and management goals for the property. For example, ponderosa pine requires full sunlight to reproduce successfully, whereas grand fir can reproduce in heavy shade; Douglas-fir and western white pine are able to reproduce in partial shade.

Tree thinning is the primary method used to control forest density, species composition and tree growth. There are two types of thinning that can be utilized: non-commercial (or pre-commercial) thinning, and commercial thinning. Non-commercial thinning is applied in young forests before trees have commercial value. The objective is to cut less desirable trees and create additional growing space for the remaining trees. Cut trees are often left in the forest to decompose. Commercial thinning is implemented when trees are larger, older and have commercial value. Cut trees are removed and sold to wood products manufacturers. Before tree thinning is implemented, a forester prepares a silvicultural prescription that details the goals of the thinning project and describes how, where and when the work will be accomplished.



Example of an overstocked regenerating stand

The Inland Northwest typically experiences dry summers. During the summer season, trees depend primarily on moisture stored in the soil to maintain their growth. Thinning reduces the total number of trees competing for water and allows residual trees to more readily obtain soil moisture for a longer period during the growing season. Forest productivity is often enhanced when dense (over-stocked) forests are thinned to reduce competition for soil water. Deeper soils and cooler aspects (north and east) are more beneficial to tree growth because they store greater amounts of water that is available later into the growing season. Where soils are shallow or the aspect is hot and dry (south and west aspects), tree growth slows during drought periods due to a lack of soil moisture. Shade-intolerant (light loving) species are adapted to grow on hot, sunny areas (south and west aspects) and are more resistant to drought. Shade-tolerant species grow in cool, moist forests most commonly found on north and east aspects and often adjacent to riparian areas. Shade-tolerant species are less resistant to drought. The availability of nutrients in the soil will also influence tree growth. Nutrient availability is influenced by soil type and the abundance of organic material present in the soil. Fertilizer can provide an additional boost to the health and growth of a forest on some soil types. Forestry activities such as slash disposal, prescribed burning, and erosion controls can be implemented to maintain or improve nutrient availability.

Management Action

One of the primary forest health problems in Inland Northwest forests is over-stocking (too many trees per acre). Over-stocking causes tree stress because neighboring trees must compete intensively for

light, water, and nutrients. Overstocking is a concern in a few pockets of the Silver Beach Homes property. Thinning these pockets is recommended in the near future.

Dwarf Mistletoe

Dwarf mistletoes is a small, leafless, parasitic plant that grows on branches and stems of conifers. They are usually one to five inches tall and mostly green yellow, brown or orange in color. A host tree is typically infected by only one species of mistletoe. Bunched growths of branches (witches' brooms) and swollen branches are frequently caused by mistletoe so they are good places to look for mistletoe shoots.

Female plants produce seeds that spread the disease, but both sexes can damage trees. Seeds are produced in small berries. During late summer, berries burst and seeds can travel horizontal distances of 10 to 40 feet. The sticky seeds attach to branches and infect them. Birds can distribute seeds, but most infection is from nearby infected trees. The time it takes mistletoe to kill a tree depends on several factors. Damage tends to develop slowly until the tree is heavily infected. Trees are usually killed within about 10 to 15 years once they become heavily infected throughout the crown.

Management Action

Control of dwarf mistletoe involves reducing the amount of mistletoe to a low level. Heavily infected trees are cut or girdled to kill the tree and the parasitic plant. Lightly infected trees can have infected branches pruned. All live branches up to the highest infected branch should be cut off. Infected trees can be retained if they are isolated from healthy trees or surrounded by resistant tree species within 40 feet. If the disease is so advanced that most trees need to be cut, planting mistletoe-resistant trees to replace the cut trees is a good practice. Douglas-fir, for example, can be replaced with ponderosa or western white pine.

Mistletoe control is generally a long-term process with activities usually performed around the time of harvest or thinning operations to reduce cost. The first step is to select heavily infected trees for removal during current or future harvests. Second, infected young trees are removed during pre-commercial thinning operations. Third, prune infected branches off of trees which are left behind but have light infections. Lastly, monitor for mistletoe outbreaks every three to five years.



Example of dwarf mistletoe in western larch

Stem Decay

Two very common stem decays in the region are Indian paint fungus (*Echinodontium tinctorium*) and red ring rot (*Phellinus pini*). Both were observed on the subject property, although neither was wide spread. The rots can be very harmful, affecting the usable volume in infected trees and increasing the likelihood of wind throw.

These tree diseases are spread through wind-borne spores. The spores attach to branches and rot trees later in the tree's life. Indian paint fungus is tan and water soaked at first, becoming yellow to orange and stringy in texture, within the tree stem. Stems are often almost completely hollowed by this decay. Conks (fruiting bodies), which can reach sizes of a foot in diameter, develop under branches or branch

stubs. They are woody, hoof-shaped and toothed on the underside. The upper surface is dark brown or black, lower surface is gray, and the interior is brick red. Punk knots also have brick-red tissue within.

Red ring rot first appears as a red or brown stain in the heartwood of the stem. Conks are woody with a dark, ridged upper surface and a tan or cinnamon colored porous layer on the underside. They can vary from hoof-shaped to bracket-shaped on the bark with little or no upper surface. They are usually about two inches in diameter.

The stain from this fungus often forms concentric rings or crescents in the stem cross section. In later stages, white pockets are distinct from the surrounding dark red or brown wood and the decay texture is stringy and mostly white. Swollen knots may be the only outward sign of infection if conks are not present.

These knots have a spongy texture and are filled with brown mycelium.



Phellinus pini

Management Action

These common stem decays are frequently observed in stands of mature or overmature host species (mostly grand fir and western hemlock). The best way to minimize stem decay is to manage the timber on shorter rotations (not longer than 120 years). To further minimize heart rots, it is extremely important to minimize mechanical wound damage when entering a stand with heavy equipment to implement silvicultural treatments. As no chemical or biological method will protect a tree, wound prevention is the only effective way to keep from reactivating dormant infections. The following actions should minimize heart-rot:

- 1) Thin trees early to increase growth and maintain stand vigor, but use care to minimize trunk wounds.
- 2) When partial cutting, select crop ("leave") trees with at least 50% live crown ratio, at least eight inches of current leader growth, and the best form and height.
- 3) Minimize wounding in thinning operations, prescribed burns, slash disposal, or overstory removal.

Wounds may be prevented by:

- Not logging in the spring and early summer, when trees are more susceptible to injury than later in the year.
- Using the proper equipment for the site.
- Marking "leave" trees rather than "cut" trees.
- Planning straight-line skid trails before logging, and avoid sharp turns. Leave designated "bump" trees or cull logs along the edge of skid trails.
- Matching log length with final spacing. A close final spacing means skidding short logs, while longer logs are suitable for wide spacing.
- Logging skid trails first, before the rest of the stand, so that the skid trail is clear.

- Cutting low stumps (less than 3-4") in skid trails, to keep the skidder or logs from being shunted into crop trees.
- Falling trees so they are at a 45 degree angle directly towards or directly away from skid trails, to prevent too much maneuvering by the machinery or sharp turns by the log.
- Cutting limbs flush to the bole before skidding to prevent branch stubs from shunting logs into crop trees.
- Removing slash and other fuels from around the base of crop trees before under-burning the stand.
- Talking to anyone operating in your stand about minimizing damage to crop trees, and if necessary make contract specifications regarding penalties for damages.

Root Disease

Root diseases are the most damaging group of tree diseases. Diagnosis and identification is based on:

1. Circular groups of dead and dying trees. Root diseases tend to kill a few trees each year. Look for dying trees at the edge of a group with dead trees towards the center.
2. Thinning tree crowns. Crowns of root diseased trees fade in color, thin from the inside of the tree crown towards the edge. Diseased trees may produce a cone crop, though much of the seed is not viable.
3. Young trees are killed more quickly than older ones.
4. Symptoms and signs in roots and root crowns. Trees with advanced root disease may have basal resin flow, wood discoloration and decay, and presence of fungal tissue.

Three of the most common root diseases found in the Inland Northwest include laminated root rot (*Phellinus weirii*), Armillaria root rot (*Armillaria ostoyae*), and annosum root and butt rot (*Heterobasidion annosum*). The following table displays the primary, intermediate, and seldom hosts for each species of root disease.

Root Disease	Primary Hosts	Intermediate Hosts	Seldom Hosts
Laminated	DF, GF, MH, PSF	SA, WH, ES	PP, LP, WP, WL
Armillaria	DF, GF	PP, LP, WP, SA, WH, ES, WRC	WL
Annosum	GF, SA	ES, DF, LP, PP, WRC	WL

Species key: DF=Douglas-fir, GF=grand fir, MH=mountain hemlock, PSF=pacific silver fir, SA=subalpine fir, WH=western hemlock, ES=Engelmann spruce, PP=ponderosa pine, LP=lodgepole pine, WP=white pine, WRC=western red cedar, WL=western larch

Management Action

Root disease is managed by promoting the establishment and growth of resistant tree species. Not all conifer species are equally susceptible to root disease. Many young stands can be grown to merchantability if disease-tolerant species are favored.

Dead and dying trees can be salvaged; however, rates of disease spread and tree mortality may not be reduced. There is some evidence that partial cutting increases the rate of mortality in root-diseased stands.

When combined with other forest pathogens or insect outbreaks, root disease can have a significant impact on a stand over a 15-year period. Root disease is often the initial weakening agent of forest stands prior to large-scale insect outbreaks. The only effective and practical way to manage for root disease in this scenario is to establish and retain tolerant species, such as western larch and ponderosa pine.



Root rot pocket (Armillaria spp.)

Bark Beetles

Four different pine bark beetles affect the pine trees in the Inland Northwest. The four beetles are western pine beetle, mountain pine beetle (MPB), red turpentine beetle, and pine engraver beetle. The beetles generally favor trees that are water stressed. The bark beetle bores through the bark and lays its eggs in the cambium layer between the bark and the wood; the cambium is full of sugar and nutrients that feed the larvae.

Trees killed by bark beetles can often be recognized as suddenly-appearing red trees in the stand. A beetle-attacked tree can turn from green to red within weeks. However, other indicators will have been present for months, signs such as pitch tubes, boring dust, or frass on the bark. Red trees themselves are usually not a forest health risk. They are an indicator of what has happened in the stand and what may happen in the future.

The western and mountain pine beetles are considered major tree killers in eastern Washington. Both prefer pines greater than six inches in diameter. Trees that they attack usually die.

The red turpentine beetle generally attacks only the bottom six feet of the tree. It usually attacks a tree that is under stress or has already been attacked by another beetle. The exception is if a timber harvest has recently occurred the turpentine beetle will attack the stump of a harvested tree and occasionally standing trees near those stumps. A tree attacked only by the red turpentine beetle will normally not die unless attacked several years in a row.

Pine engraver beetles are slash-breeding insects. These beetles primarily attack fresh, green material on the ground that is greater than two inches in diameter. Examples would be logging slash, tops of trees broken during wind or ice storms, and non-commercial thinning debris (trees cleared around new homes or developments is a prime example). Once green material hits the ground, it is a food source for three to six

months. After the three to six months, the sugary layer under the bark turns sour. The pine engraver beetle generally attacks slash in April or May during its first flight. Another flight will occur eight weeks later. This second flight will look for green slash; if it is not available they will look for stressed trees and attack the top of the tree. If the tree is less than 20 feet tall it will likely die; however, larger trees will most likely survive, although their tops may be attacked. Usually another beetle species will come in and kill these weakened trees.



Pine engraver beetle (*Ips pini*)



Western pine beetle (*Dendroctonus brevicomis*)



Red Turpentine beetle (*Dendroctonus valens*)



Mountain pine beetle (*Dendroctonus ponderosae*)

Management Action

If mountain or western pine beetle are deemed to pose a significant risk to the subject property, application of an appropriate insecticide prior to a beetle attack can be effective. Thinning to remove unhealthy pine trees and to promote the vigor of remaining trees may also be employed, but is not a guaranteed method of prevention. Once a stand is successfully attacked, there is little that can be done to save the stand. However, if the infestation is at a low or moderate level, removing infected trees may help prevent further spread of the beetles.

In general, to minimize pine engraver attacks, do not create logging or thinning slash greater than two inches in diameter between January and June. If logging is conducted during these times the following suggestions should minimize a pine engraver problem.

1. Proper utilization of all material down to two inches in diameter.
2. Pile and burn material greater than two inches within six weeks if possible.
3. Chip or remove material greater than two inches in diameter within six weeks.
4. Form a green chain of fresh slash; this option provides a continuous supply of food for the beetle through their entire breeding season, keeping them out of standing trees.

Wildfire – Overview

Wildfire in the Inland Northwest can be a natural ecological process or a destructive threat to property and life. Early humans learned to use forest fires to influence flora and fauna found in the region. When European settlers started making improvements to the land that included buildings and perishable crops, forest fires became viewed as a destructive and harmful force. Forest fire can be a useful tool in the correct situations, however at the Silver Beach Homes property the utilization of ecological fire restoration is not recommended.



Available fuel and its properties help in predicting the probability of ignition, rate of spread and fire intensity. The Anderson Fuel Models were developed to aid in classifying pre-fire fuel loads and predicting fire behavior. Most of the property is classified as either Model 2 or Model 5; both models have a grass or shrub ground fuel that burns readily but with low to moderate intensity that is not likely to move into the overstory unless wind driven. The greatest wildfire risk to the Silver Beach Homes property is a wind driven fire that starts off of the property and spreads northeast into the property.

Management action

A healthy and appropriately stocked forest is more likely to be resilient to the effects of forest fire. Correct stocking levels should keep the risk of a stand replacing fire to a minimum by eliminating thickets of overcrowded regeneration that could potentially lead to a crown fire. A continuous tree structure where fuels are present from the ground to the crowns is often referred to as “ladder fuels.” Wildfire will likely threaten the property at some point; however, if proper silvicultural actions are taken a wildfire will be easier to suppress and the stands will be more resilient to the effects of a fire.

Some practices to reduce risk of wildfire should include:

1. Utilizing the road system to develop green fire breaks.
 - a. This is accomplished by spacing the overstory trees 30 to 50 feet between live crowns.
 - b. Thinning (spacing overstory 30 to 50 feet) for 100 feet either side of road, this will provide fuel break.
 - c. Controlling the number of pole/sapling size trees to avoid the availability of ladder fuels.
 - d. Keeping the roadway and culverts free of debris.
2. Create fire breaks along property lines
 - a. Thinning overstory trees (spacing overstory 30 to 50 feet) near property line to provide fuel breaks along property line. This will allow a crown fire to move to the ground unless it is a wind driven fire.
 - b. Controlling the number of pole/sapling size trees to avoid the availability of ladder fuels.

Invasive Species

Invasive grasses and forbs can have a detrimental effect on area wildlife. Wildlife have adapted to use certain native plants (or parts thereof) at different times of the year. Plants that are not native to the area can sometimes out-compete native plants and disrupt the natural balance that has developed over time.

Management Action

Knapweed, hounds tongue and thistle are all present on the property in low numbers. Generally, herbicide treatment is the most cost effective method for quickly eliminating established areas of these weeds. Properly selected and applied herbicides will not harm grass populations and killing the weeds will allow native or beneficial grasses and forbs to re-establish in the area.

Resource Category II – Soils

There are five major soil types found on the Silver Beach Homes property. A brief description of each soil type is listed below. A detailed soil report is found in the Appendix of this document.

Moscow Silt Loam, 25 to 40% Slopes (map unit 160)

The Moscow soil is moderately deep, well drained soil, found on foot slopes of mountains. This soil is formed mainly from residuum and colluvium derived from granite and there is a mantle of volcanic ash and loess in the upper part. An organic mat usually about 1 ½ inches covers the soil surface. Typically this soil is found around 2,200 to 4,000 feet in elevation.

The average annual precipitation is around 29 inches, and the average soil temperature is 43°F. There are typically 80 to 100 frost-free days. The available water holding capacity is moderate and permeability is also moderate. Runoff is rapid and the hazard of erosion is high for the Moscow soil. The effective rooting depth is 20 to 40 inches.

The native vegetation is conifers, shrubs, forbs, and grasses. Douglas-fir is the most common conifer found in this soil type. The site index for Douglas-fir on the Moscow soil is 94, resulting in the possible production of 68 cubic feet per acre per year. The main concern with timber production and harvesting for the Moscow soil is the steepness of slope. Equipment limitation is severe in relation to the steepness. Delay of regeneration in canopy openings may occur with invading brush species crowding out tree seedlings.

Clayton Fine Sandy Loam, 5 to 15% Slopes (map unit 57)

The Clayton soil is very deep, well drained soil found on terraces. This soil is formed mainly from a mixture of glacial sediments. An organic mat 1½ inches or more usually covers the soil surface. Typically, this soil is found at lower elevations, approximately 2,500 feet.

The average annual precipitation is around 23 inches, and the average soil temperature is 45°F. There are typically 110 to 120 frost-free days. The available water holding capacity is high and permeability is moderate. Runoff is slow to medium and the hazard of erosion is slight to moderate for the Clayton soils. The effective rooting depth is 60 inches or more.

The native vegetation is conifers, forbs, shrubs and grasses. The most common conifers on this soil type consist of Douglas-fir, ponderosa pine, western larch, lodgepole pine, and western white pine. The site index for Douglas-fir growing in this soil type is 101, resulting in the possible production of 72 cubic feet

per acre per year. The main concerns with timber production and harvesting for the Clayton soil is the hazard of rutting and soil compaction when soils are wet. Trees can be subject to windthrow when soils are wet and high winds develop. Overgrazing can become a problem allowing non-desirable plants to increase. Successful regeneration on the Clayton soil can be accomplished with careful planning.

Moscow-Rock Outcrop complex, Slopes 0 to 30% (map unit 162), Slopes 35 to 65%(map unit 163)

The soils in this complex are found on foot slopes and ridgetops of mountains. The slopes are complex, with about 65% Moscow silt loam and 20% rock outcrop. An organic mat about 1 ½ inch thick usually covers the soil surface. This soil is found at 2,200 to 4,000 feet in elevation. The average annual precipitation is 29 inches, and the average soil temperature is 43°F. There are typically 80 to 100 frost-free days. The available water holding capacity and permeability are moderate for this soil. Runoff is medium and the hazard of erosion is moderate. The effective rooting depth is 20 to 40 inches.

The native vegetation is conifers, forbs, shrubs and grasses. Douglas-fir grows well in these soil types. The site index for Douglas-fir on the Moscow complex soil is 94, resulting in the possible production of 54 cubic feet per acre per year. The main concerns with timber production and harvesting for the Moscow complex soil is the steepness of slope and hazard of rutting and soil compaction when the soil is moist. Equipment limitations are moderate in relation to slope steepness. Regeneration in open canopies can be delayed due to invasion of brush species. Rock outcrops causes a limitation to the even distribution of reforestation.

Mobate Gravelly Loam, 30 to 65% Slopes (map unit 152)

The Mobate soils are shallow, well drained soils found on foot slopes and side slopes of mountains. These soils are formed mainly from residuum derived from granite, with an admixture of volcanic ash and loess in the surface layer. An organic mat of 1 inch usually covers the soil surface. Typically, the soil is found on elevations of 2,500 to 4,500 feet.

The average annual precipitation is about 29 inches, and the average soil temperature is 44°F. There are typically 80 to 100 frost-free days. The available water holding capacity is low and permeability is moderate. Runoff is very rapid and the hazard of water erosion is very high for Mobate soils. The effective rooting depth is 14 to 20 inches.

The native vegetation is conifers, forbs, shrubs and grasses. The most common conifer found growing in this soil type is ponderosa pine. The site index for ponderosa pine on this soil type is 81, resulting in the possible production of 35 cubic feet per acre per year. The main concern with timber production and harvesting for the Mobate soils is the steepness of slope. Regeneration may be delayed where invading brush species are not controlled. Low available water capacity will influence the seedling survival.

Management Action

The main concern in producing and harvesting timber on any soil type is water erosion, slope and plant competition. Soil types formed by loess tend to have rapid runoff and are prone to severe erosion. Compaction is another concern as the soil is easily compacted under moist soil conditions. For these reasons, the timing of harvest and the type of harvest equipment should be carefully planned. To reduce the potential impact, harvesting should occur only when soils are dry or frozen. Both mechanized and conventional (i.e. handfelling) harvest systems are well suited to the topography and soils found on the property. The best system will depend on the harvest prescription and the timber characteristics.

Following harvest activities, reforestation must be carefully managed to reduce competition from undesirable understory plants. Soil disturbance from harvest operations can lead to total occupancy of tall shrubs and introduction of unwanted invasive species. Minimizing the amount of soil disturbance is important to avoid excessive shrub competition. The Silver Beach Homes property has good potential for producing quality conifers, grasses, and forbs, thus producing quality timber products and forage for wildlife.

Silver Beach Property
T29N, R41E, WM
Stevens Co., Washington



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Description — Forest Productivity (Cubic Feet per Acre per Year)

Forest productivity is the volume of wood fiber a ponderosa pine stand will likely produce. This number is expressed as cubic feet per acre per year and calculated at the age of culmination of the mean annual increment (CMAI). The calculation is for a fully stocked, even-aged, unmanaged forest stand.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this attribute, only the representative value is used.

Forest Productivity by Map Unit — Stevens County, Washington (WA063)				
Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
57	Clayton Fine Sandy Loam, 5 to 15% Slopes	101	.5	0.7%
152	Moscow Silt Loam, 25 to 40% Slopes	94	17.7	25.8%
160	Moscow-Rock Outcrop complex, Slopes 0 to 30%	94	19.4	28.3%
162	Moscow-Rock Outcrop complex, Slopes 35 to 65%	94	10.4	15.2%
163	Mobate Gravelly Loam, 30 to 65% Slopes	81	20.5	30.0%
Totals for Area of Interest			63.3	100.0%

Resource Category III – Water Quality/Riparian and Fish Habitat/Wetlands

Water Quality

Riparian areas are defined as areas adjacent to free water where the vegetation of that area is directly affected by the free water. These areas include streams, rivers, lakes and ponds, seeps, springs and wetlands; water is the main factor distinguishing it from the surrounding uplands. The additional water availability in a riparian system supports lush vegetation, which helps to retain water in the system.

Riparian areas are beneficial to the ecosystem and the landowners in many ways. With proper management, vegetation and large organic debris filter sediment and can slow the water's velocity, thus reducing the sediment transported by the water. Trapping these sediments in the Riparian Management Zone (RMZ) contributes to the rich soil found in riparian areas, further supporting the vegetative community. Grasses, shrubs, and trees in the riparian area catch and hold sediments and pollutants from adjacent fields and forests. Sediments are removed from water, improving the overall water quality and clarity. Healthy riparian areas slow water flow which reduce the likelihood of

downstream flooding due to the filtering and spreading the water, and the stabilization of the stream banks during high water events.

Riparian areas are home to a variety of wildlife and bird species that find food, shelter, and relief from temperature extremes. Loss of vegetation is one of the most serious changes affecting the riparian area. The impact can be great, because until re-growth occurs, the land is subject to increased erosion, decreased water quality, and wildlife use will be altered. Some of the plant and tree species that contain high forage value for wildlife species include aspen, serviceberry, and cottonwood. Establishing additional species such as red-osier dogwood, elderberry, Oregon ash, chokecherry and others will help increase plant diversity and improve the habitat values. Planting any of these shrub species in the riparian area will provide additional forage and understory cover for the many wildlife species that use this area.

Riparian and Fish Habitat

The 1,100 acre lake near the property is a primary fish bearing water body, and thusly is defined as a Shoreline of the State (Type S), as defined by the Washington Shoreline Management Act. Furthermore under the Act, lakes greater than 1,000 acres are deemed "shorelines of statewide significance," a classification that provides them with special consideration beyond regional concerns. This is the only open water on the property. The greater riparian area serves as habitat for migratory waterfowl, amphibians, reptiles, birds, mammals and insects. Plentiful ground cover on the property already reduce sediment delivery to the lake and increases water quality for the watershed.

Management Action

It is imperative to protect the lake because of its important ecological services and habitat. The minimum protection established by the DNR Forest Practices Rules is a 100 foot Riparian Management Zone (RMZ) in which limited timber harvest activity can occur. This limit was determined for a site class 3, derived from the site index values obtained from the US Natural Resources and Conservation Service soil survey (<http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>). All of the timbered property considered in this plan is located outside the RMZ. Harvest activities should be planned during dry or frozen periods to avoid sediment delivery to the lake.

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Resource Category IV – Forest Inventory/Timber/Wood Products

Purpose and Scope

Through the implementation of the recommended silvicultural treatments, the management objectives for this property can be achieved. This section of the plan will describe past management activities which occurred, the stand structure and condition, preferred management regime, and future management activities.

Silvicultural Treatments

The following is a brief description of the silvicultural treatments that are suggested to occur on the property. These definitions are meant to familiarize the reader with management options identified in this section.

Pre-commercial Thinning

Pre-commercial thinning occurs in young stands that are growing with very high stocking levels. An ideal stand to thin would be one where the trees are less than 15 feet tall and in excess of 400 trees per acre. The ideal target stocking level for trees of this size is around 250 trees per acre. Species selection is generally the same as for a commercial thin with an average spacing between trees of approximately 12-15 feet.

Commercial Thinning

The ideal number of crop trees to grow through to the end of a stand's rotation age is approximately 150-180 trees per acre depending on site conditions. This average ranges applies to more mesic conditions. When an even-aged stand of younger merchantable-sized timber has a significantly greater number of trees per acre, a commercial thinning should occur to lessen the inter-tree competition and to concentrate the growth on the potential crop trees. In a commercial thinning harvest defective, poorly formed, poor vigor, and suppressed trees should be targeted for removal as well as any additional trees necessary to reach the desired stocking level and species composition.

Seed Tree/Shelterwood

Seedtree or shelterwood harvests promote even-aged stands. When existing stands are harvested, approximately 10-30 trees per acre are retained. The trees, of good quality and vigor, are retained for a seed source for natural regeneration as well as for shelter for the newly established tree seedlings. After the regeneration has become well established with acceptable stocking levels, and the trees are generally larger than 2-3 feet in height, the seed and shelter trees are harvested to release the established understory. If some areas do not re-establish seedlings with natural regeneration, supplemental planting should occur to stock those areas.

Overstory Removal

Overstory removal harvests occur in a two-storied, two-aged stand, where a larger, older, scattered layer of trees overtops a thick layer of young vigorous trees. The older, generally non-vigorous trees are removed to reduce the competition for nutrients, water, and light in the understory.

Reforestation

Natural reforestation occurs when viable seed germinates and becomes an established seedling that can grow to maturity. Silvicultural treatments to control sunlight, space and nutrients favor different species' reforestation abilities. Tree planting, with stock from a nursery, is done early in the spring and later in the fall when conditions favorable to the seedlings are found. The art and science of tree

planting has progressed to improve seedling survival, genetics and cost effectiveness. Currently, containerized seedlings are preferred by many. Each seedling is germinated and grown for at least one year in growing medium that stays with the tree as it is outplanted. This “plug” of growing medium helps the seedling to survive the stress and strain of transplanting and also makes the planting process less prone to error. Advantages of successful natural regeneration are low cost and proven tree genetics. Advantages of tree planting are control of species composition, possible improvement of genetics and stocking level control.

Site Preparation

One of the major obstacles to seedling survival, both natural and planted, is shrub and grass competition. In most stands, a major component of the understory is shrub and grass species rather than the desired tree seedlings. This becomes a management challenge when stands are opened up and shrubs quickly occupy the open space. Proper site preparation is crucial for planting success. Numerous site preparation methods are available to treat competing shrubs and grasses.

- Mechanical site preparation- ripping the brush out with an excavator or crawler tractor equipped with a brush blade can be feasible and a low cost method in areas with low to moderate slopes (0-35%).
- Chemical site preparation- is another alternative available. Herbicide spraying would kill the brush and grass and allow the seedlings optimal growing conditions for the critical time period following planting. Broadcast spraying (aerial application), although effective, would not be cost efficient unless conducted at a larger scale. Since none of the recommended silvicultural prescriptions will create this large of a planting area, this option is most likely unfeasible. As a result, the most practical chemical solution would be to spot treat planting areas with a backpack sprayer. The chemical could be concentrated on areas where it would do the most good, such as on lower clumps and around existing openings and gaps. Roundup (glyphosate) or 2,4-D has proven to be effective on the brush species present throughout the property and will not damage most tree species if applied prior to planting. Spot herbicide applications (immediately around planted seedlings) are another option, which are applied during planting operations.
- During the planting process, depending on site conditions, scalps can be made. A scalp peels back heavy sod or grass, shrubs and heavy duff to reveal mineral soil where the seedling is then planted. Scalps vary in size from one to nine square feet .

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Forest Resources

STAND 1

Overstory

This stand is dominated by large diameter ponderosa pine. Douglas-fir is common in the stand at lower levels than the ponderosa pine; western larch is present but not common. The average tree has a diameter breast height (DBH) between 18 to 24 inches and the average height is 90 feet with 40-60% crown ratio. An estimate of the volume in the stand is between 3 to 5 MBF per acre. The overall condition of the overstory is fair. A sanitation/salvage harvest was implemented in the winter of 2001-02.

Understory

The understory of the stand is again dominated by Douglas-fir and Ponderosa pine. Western larch is also common in this layer of the stand. The average tree is 3 to 4 inches DBH, 16 to 24' tall and 40% crown ratio. Overall the stocking of the understory (pole/sapling) trees is somewhat patchy. Estimated stocking levels at 20 to 40 trees per acre; however, the stocking is very inconsistent.



Regeneration

The regeneration (less than 4.5 feet tall) in the stand is in good overall condition; however, stocking levels are inconsistent. The regeneration component is dominated by Douglas-fir with some ponderosa pine, but few western larch were observed. The average tree is 2.5 feet tall with an 80% crown ratio. This layer appears to be about seven years old.

Treatment Objectives

- Improve the health of the forest through the removal of snow damaged, dead and dying timber and commercially thinning areas of stagnation, while protecting natural privacy screens provided by this stand.
- Improve visual quality and the wildlife habitat qualities of the stand.
- Return non-stocked and poorly stocked areas to timber production.
- Reduce fuel loading to acceptable levels producing a fire-safe stand of timber.
- Reintroduce natural grasses and other native plants.

Preferred Management Regime

Stand 1 is in fair condition. The most common issues are dwarf mistletoe and root disease. Stand 1 could use a sanitation salvage harvest in one to three years. Doing so would remove the dead and dying timber and begin the process of moving toward a stand with species not susceptible to the root disease problems. Planting is recommended in this stand to help control the species mix as well as some pruning. Leave trees should focus on (in order of preference) the large diameter ponderosa pine, large western larch (not infected with mistletoe), and Douglas-fir (not infected with mistletoe). Additionally,

approximately three acres across the stand are in need of pre-commercial thinning. This activity should take place following any salvage operation.

Planting ponderosa pine, western larch and some western white pine is recommended.

STAND 2

Overstory

This stand is dominated by large diameter Douglas-fir and ponderosa pine. Grand fir is common in the stand. The grand fir is generally smaller in size than the Douglas-fir and ponderosa pine. Western larch is present in this stand as well. The average tree has a diameter breast height (DBH) between 14 to 22 inches; average height is 105 feet with 40% crown ratio. An estimate of the volume in the stand is between 6 to 8 MBF per acre. The overall condition of the overstory is poor to fair.



Understory

The understory of the stand is dominated by Douglas-fir and ponderosa pine. The average tree is 0 to 4 inches DBH, 5 to 12 feet tall and 40% crown ratio. Overall the stocking of the understory (pole/sapling) trees is very patchy. Estimated stocking levels are at 5 to 30 trees per acre.

Regeneration

The regeneration (under 4.5 feet tall) in the stand is in good overall condition; however, stocking levels are very inconsistent. The regeneration component is dominated by grand fir with some ponderosa pine and a few Douglas-fir. The average tree is 1.5 feet tall with an 80% crown ratio. This layer appears to be about seven years old.

Treatment Objectives

- Improve the health of the forest through the removal of snow damaged, dead and dying timber and treating areas of stagnation.
- Improve visual quality and wildlife habitat in the stand.
- Return non-stocked and poorly stocked timberland to production.
- Reduce fuel loading to acceptable levels producing a fire-safe stand of timber.
- Reintroduce natural grasses and other native plants.

Preferred Management Regime:

Stand 2 is in poor to fair condition. The most common issues are the mistletoe and root disease. Stand 2 should be a stand for high priority treatment. The stand needs a sanitation/salvage harvest in one to two years. Leave trees should focus on (in order of preference) the large diameter ponderosa pine, large western larch (not infected with mistletoe), and Douglas-fir (not infected with mistletoe). Grand fir should be removed where practical.

Planting ponderosa pine, western larch and some western white pine is recommended.

STAND 3

Overstory

This stand is dominated by large diameter Douglas-fir with lesser amounts of ponderosa pine in the south area and a higher percentage of larger ponderosa pine in the northern area. Grand fir is common in the stand. Lodgepole pine is present but in poor overall condition. The average tree has a diameter breast height (DBH) between 12-18 inches; average height is 85 feet with 40% crown ratio. An estimate of the volume in the stand is between 6 to 7 MBF per acre. The overstory is in fair to good condition

Understory

The understory of the stand is dominated by grass and forbs with some shrub component. Grand fir, Douglas-fir and ponderosa pine were observed with the average tree is 0 to 4 inches DBH, 8 to 12 feet tall and 40% crown ratio. Overall the stocking of the understory (pole/sapling) trees is very patchy. Estimated stocking levels at 10 to 50 trees per acre.



Regeneration

The regeneration (under 4.5 feet tall) in the stand is in good overall condition; however, stocking levels are very inconsistent. The regeneration component is dominated by grand fir with some ponderosa pine and a few Douglas-fir. Ponderosa pine is slightly more heavily stocked in the northern part of this stand. The average tree is 1.5 feet tall with an 80% crown ratio. Overall stand condition is fair to good.

Treatment Objectives

- Improve the health of the forest through the removal of snow damaged, dead and dying timber and treating areas of stagnation.
- Improve visual quality and wildlife habitat in the stand.
- Return non-stocked and poorly stocked timberland to production.
- Reduce fuel loading to acceptable levels producing a fire-safe stand of timber.

Preferred Management Regime:

Stand 3 is in fair to good condition. The Douglas-fir and ponderosa pine are the highest quality trees in the stand. The lodgepole pine needs to be removed as it is in poor condition. This stand could benefit from a commercial thin and sanitation harvest in the next 2 to 5 years. Spacing of the leave trees should

be around 25 foot spacing. Natural regeneration can be effective in the stand; however, controlling the species is a concern, and thus planting may be prudent.

STAND 4

Overstory

This stand is dominated by large diameter Douglas-fir and grand fir with lesser amounts of lodgepole pine. The average tree has a diameter breast height (DBH) between 14 to 20 inches, average height is 110 feet with 80% crown ratio. An estimate of the volume in the stand is between 6 to 8 MBF per acre. The overall stand condition is fair to good.

Understory

The understory of the stand is dominated by grass and forb species with some shrub component. Grand fir, Douglas-fir and ponderosa pine were observed with the average tree size 0 to 4 inches DBH, 5 to 8 feet tall and 40% crown ratio. Overall the stocking of the understory (pole/sapling) trees is very patchy, and the quality of these trees is poor. Estimated stocking levels are at 10 to 40 trees per acre.

Regeneration

The regeneration (under 4.5 feet tall) in the stand is in good overall condition; however, stocking levels are very inconsistent. The regeneration component is dominated by grand fir. The average tree is 1.5 feet tall with an 80% crown ratio.

Treatment Objectives

- Improve the health of the forest through the removal of snow damaged, dead and dying timber and treating areas of stagnation.
- Improve visual quality and wildlife habitat in the stand.
- Return non-stocked and poorly stocked timberland to production.
- Reduce fuel loading to acceptable levels producing a fire-safe stand of timber.

Preferred Management Regime:

Stand 4 is in fair to good condition. The Douglas-fir and ponderosa pine are the highest quality trees in the stand. The lodgepole pine and grand fir should be selected for removal in this stand during the next harvest. Leave high quality Douglas-fir, western larch and ponderosa pine. This stand could benefit from a commercial thin and sanitation harvest in the next two to five years. Approximately five acres are in need of pre-commercial thinning. This activity should take place following any salvage operation.

Resource Category V – Property Access/Roads and Trails

Motorized vehicle access to and on the property is excellent at this time. There are two well established access points to the county road from the property. There are no roads recommended for abandonment.

Management Action

No improvements are needed at this time.

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Resource Category VI – Wildlife

All forest-dependent wildlife species require food, water and shelter from inclement weather (both summer and winter), and cover from predators for breeding, rearing of young, and feeding. The mixture of forest vegetation types and landforms determines suitability of habitat for each particular wildlife species. A diverse mixture of tree and shrub species, sizes, and age classes, as well as dead and dying trees in the form of snags and coarse woody debris (fallen trees and large logging debris) will increase wildlife species diversity and abundance. The presence of water and associated vegetation (riparian zones) in proximity to diverse forest habitats enhances biological diversity.

Diverse and persistent forest, shrub, and herbaceous plant stands arranged with consideration to special habitat features such as water, edge, snags, openings, and other features will increase year-round wildlife use of the property.

It is important to consider habitats (or lack thereof) located around the subject property; this is often referred to as the landscape matrix. This offers an overall picture of how a particular parcel could be managed in comparison to adjacent habitats. The matrix can impact how animals use patches of habitat. Land uses within a matrix can differ in their impact on related wildlife. Conversion of forests to residential development or agriculture is often regarded as permanent habitat loss, while silvicultural disturbances tend to provide a more heterogeneous structure and often provide quality habitat for wildlife. The landscape matrix may provide clues to a land manager of the potential wildlife uses of a particular property and thus, how to manage it.

As previously mentioned, wildlife species have a set of specialized requirements, including food, water, and cover. If one of these requirements is in short supply (referred to as a limiting factor), overall effectiveness of the habitat is reduced. Limiting factors are comparable to the staves in a barrel - if one of the barrel staves reaches only part-way to the top, then the barrel will only hold water up to that level. The barrel staves represent different habitat aspects of food, water, and cover. A habitat's effectiveness or ability to support wildlife is based on its most limiting factor. These three factors - cover, food, and water - can be further broken down into sub-factors.

Cover

High plant diversity across a landscape provides cover requirements for many species. Cover requirements also differ within a species depending on time of year and the activity of the animal. Cover can be broken down into sub-components of thermal and security cover; these differ in their functions, but may occupy the same site.

The vegetation that provides thermal cover is generally denser than security cover. Thermal cover provides animals protection from the elements by providing them with warmer conditions in winter and cooler conditions in summer. Thermal cover requirements vary with species, ranging from conifer thickets for deer and elk, to the grass cover used by smaller mammals such as mice and voles.

Security cover provides animals protection from predators. Uses include resting, loafing, and bedding areas, feeding areas, travel corridors, and areas for rearing young.

The most effective habitat includes components of thermal and security cover in proximity to the other main habitat components of food and water. Interspersion of the important components increases an animal's ability to travel between and use the various areas for feeding, security, and reproduction. A local area may be improved for wildlife without increasing the amount of any food or cover resource, if the interspersion of the needed resources is increased. In addition, the interspersion of the various

habitat components can produce “edge habitat.”

Food

High plant diversity also offers a broad variety of foods needed by different species. Deer, moose, and elk vary in their food choices. White-tailed deer commonly browse the tips of woody trees and shrubs, and forage on broad-leaved forbs when they are available. Elk graze herbaceous plants such as grasses, clover, and alfalfa, feeding on browse when it is readily available. Moose are primarily browsers, preferring the tips of woody trees and shrubs, especially willows and red-osier dogwood. They will also consume a variety of broad-leaved forbs and aquatic plants, depending on availability.

Water

The need for water varies between species, ranging from the strong association and absolute water requirement of amphibians and aquatic mammals, to species that require only minimal amounts for drinking water. Waterfowl, including migratory ducks and geese, use open water for escape areas from predators, and also feed on aquatic insects, crustaceans, and plants. Shorebirds, such as snipe and herons, use shallow water areas for feeding and will nest along the shorelines.

The subject property provides suitable wildlife habitat for several species of birds, small mammals, and ungulates. Specifically, the property provides areas of thermal and security cover, especially for big game animals such as deer. The riparian zone, in particular, provides limited quantities (due to development along the lakeshore) of each of the identified habitat features that are essential for wildlife. The riparian zone offers safe travel corridors, bedding areas, and security/thermal cover. Forage is found in the form of native grasses and forbs.

Wildlife habitat can be protected, enhanced, and even created with appropriate management done in conjunction with other forest management activities. A brief explanation of some of the important habitat components follows along with management recommendations.

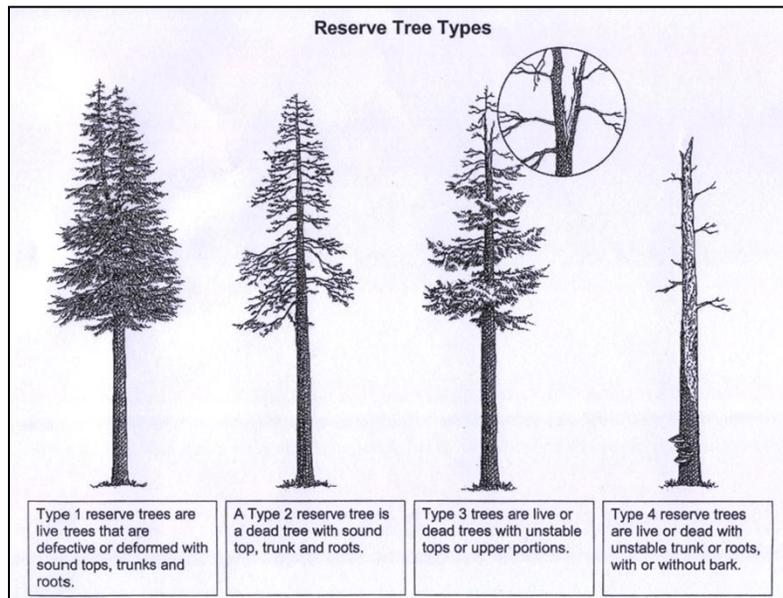
Habitat Component Descriptions

Snags and Coarse Woody Debris

About one-third of forest wildlife species are dependent on snags (standing dead trees) and coarse woody debris (down logs and trees). More than 60 of these species use cavities (holes excavated in trees) created primarily by woodpeckers for nesting and shelter. Most cavity nesters prefer the harder and larger diameter snags, i.e. those that are in the earlier stages of decay. The taller and larger diameter snags benefit more species, for a longer period of time, than the smaller snags. However, small diameter and shorter snags (including stumps at least three feet in height) are also utilized for feeding and cover. Snag dependent wildlife also use live trees with substantial amounts of decay. This includes broken tops, large dead and/or broken branches, cracked or damaged boles, heart rot, and mistletoe and rust brooms. Brooms (clumps of deformed branches) caused by these pathogens and parasites are readily used by platform nesters such as hawks, owls, eagles, and ospreys and as shelter for mammals such as squirrels and pine martens. Most wildlife species that use snags will use trees with substantial decay. Many of these defective trees will last for long periods of time and although they have little economic value, they have excellent value to snag-dependent wildlife.

Coarse woody debris goes through a similar decay cycle and usage pattern as snags. The larger diameter and longer length hard logs last longer and are used by more wildlife species than the smaller and softer pieces of coarse woody debris.

It has been determined that wildlife is so dependent upon snags and coarse woody debris that these have become regulated resources in the state of Washington. Minimum retention of these critical components is mandatory by law when timber harvest occurs. Ideally, these two components should be scattered throughout forested stands. If there is a lack of either resource, steps can be taken to increase their occurrence, some of them being very easy, such as mechanical “high-stumping” (described below). Eastern Washington FPA regulations require the following retention during logging: two wildlife recruitment trees/acre (“wrts”), two green recruitment trees/acre (“grts”), and two segments of coarse woody debris/acre (CWD) – also known as the law of “2-2-2.” The picture below summarizes the four types of wildlife recruitment trees defined in the Washington FPA.



Understory Vegetation

This consists primarily of grasses and forbs in sunnier locations and berry producing shrubs and hardwood trees where sufficient sunlight and moisture are present. Some shade tolerant understory conifers also comprise this habitat category. Ground nesting and foraging birds and the majority of mammals use this habitat feature for food, shelter, and cover. Understory vegetation is scattered throughout the property except where the forest canopy has closed and eliminated sunlight to the forest floor.

Management Recommendations

These management recommendations are consistent with overall management goals for the property. They are designed to protect and enhance wildlife habitat and accomplish forest management objectives.

- ⇒ During a commercial harvest it is important to retain snags during the harvest. Trees with low economic value that contain obvious defects useful to wildlife should be retained wherever possible. If snags are in a shortage, creating them can be a viable alternative. Created snags can

include size ranges from high stumps (at least three feet in height and at least 10 inches in diameter) up to those that are at least 16 inches in diameter and at least 30 feet tall. Snags can be created from conifers by girdling it to kill the whole tree. Broken top or dead top trees can be created by girdling at the point of desired breakage with a chainsaw. A mechanical harvester during a harvest operation can also create snags.

⇒ Retain existing large pieces of coarse woody debris if possible. Large treetops and butt ends that are bucked during harvests can be retained for coarse woody debris. This component can also be created from poor quality trees that are at least 20 feet long and at least 10 inches in diameter at the small end. When small amounts of blowdown occur between harvests, consider leaving a portion of the individual tree or large pieces of trees for wildlife. The larger pieces (>12 inch diameter) are best.

⇒ Enhance nesting habitat by erecting one to two small to medium nest boxes per acre. Other potential habitat improvements include creating a hawk nest platform in the top of a defective tree. In the wetland area nesting platforms could be created for waterfowl species.



Example of a mechanical “high-stump”

Understory

- ⇒ Retain understory vegetation wherever possible. Sites that may be disturbed during management activities and exposed to increased sunlight may be seeded to a wildlife forage seed mix. The creation of small food plots using forage seed mix in areas with available sunlight would intersperse food with cover and increase habitat effectiveness.
- ⇒ Planting shrub species such as blue elderberry, serviceberry, chokecherry, and mockorange can be undertaken to enhance species diversity and berry production in the understory of the property. This would help all wildlife species, particularly birds.

Wildlife Species Present/Observed

The property supports a wide assortment of wildlife. White-tailed deer, moose, elk, mountain lion, black bear, and coyotes are some of the mammals that utilize the property. Other mammals likely include bobcat, deer mouse, little brown myotis (bat), porcupines, raccoons, red squirrels, snowshoe hares, shrews, martens, weasels, badgers, and voles. Common loon and red-necked grebe are two important bird species that utilize the aquatic habitat adjacent to the property.

Resource Category VII - Protection of Special Resources

The Washington DNR “FPRAT” database reported *no conflicts* on priority habitat species, threatened or endangered species, cultural/historical areas, and special plant species, as of the report request date, June 30, 2013.

Resource Category VIII - Aesthetics and Recreation

The long-term results of timber management activities should protect and enhance the visual and recreational values of the property owners.

Resource Category IX - Specialized Forest Products

At the present time there are no plans to develop non-timber forest resources on the property.

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025-33	
Stand #1		SA												
			MH											
		PS								SA				
		PC	OS	TP										
			WS										WS	
Stand #2		SA												
			MH											
		PS								CT				
		PC	OS	TP										
			WS										WS	
Stand #3		CT												
			MH											
					PS								CT/SA	
					PC	OS	TP						PC	
				WS									WS	
Stand #4		CT												
			MH											
					PS								CT/SA	
					PC	OS	TP						PC	
				WS									WS	
Harvest			Maintenance				Evaluation				Silviculture			
SW=Seed tree/Shelterwood			M=Monitor				HE=Harvest Evaluation				OS=Order Seedlings			
OSR=Overstory Removal			RM=Road Maintenance				PS=Regeneration success				TP=Tree Planting			
CT=Commercial Thinning			RB=Road Building				PE=Pest Evaluation				HT=Herbicide Treatment			
GS=Group Selection			WS=Weed Spraying				MH=Monitor Health				PC=Pre-commercial Thinning			
SA=Sanitation/Salvage			SD=Slash Disposal								PR=Pruning			
											SP=Stie Prep			

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APPENDIX

Forestry Related Web Sites

Association of Consulting Foresters flier

Society of American Foresters flier