Eagle Lake Community Association
Forest Management Plan

Parcel Numbers: 172650027000, 172651043000, 172652035000
Orcas Island, WA

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March, 2012

This forest management plan was created to serve as a guiding document for the management of approximately 224 (156, 39, 29 in Phases I, II, and III respectively) acres of forest land owned by Eagle Lake Community Association (parcel numbers 172650027000, 172651043000, 172652035000). The subject parcels—removed from the Designated Forest Land (DFL) program starting in the 1990's—provide the Association's members with a mosaic of wild and scenic woodlands that enhance and protect their homes and individual small parcels. The community forest property is part of a landscape that contains a wide variety of forested stands, each with its own set of management opportunities and challenges. This Forest Management Plan is intended to provide the landowners and Board-level managers of this property with expert guidance in the management and protection of Eagle Lake's forested community property at the landscape scale. This plan departs from the typical DFL-compliant plan as it does not identify and provide management recommendations for individual stands. Also, information on soil types, site class, and invasive species management is not addressed as these topics were outside the scope of the core management objectives identified by the landowners.

In keeping with the dynamic nature of both natural forest systems and the planning process, it is expected that this plan will be reviewed periodically, and revised to reflect changing conditions.

Goals and Objectives

The overarching management goals for the Eagle Lake Community Properties are to maintain a healthy forest while providing privacy, wildfire protection, safety, recreation opportunities, wildlife habitat, and natural beauty.

The following is a list of objectives that support the aforementioned goals:

1. Enhance the property's scenic and ecological features.
2. Promote stand structures that reduce hazardous fuels and minimize the risk of uncontrollable forest fire.
3. Promote late-successional (older) forest characteristics.
4. Increase wildlife habitat for a diversity of species.
5. Improve and maintain safe forest access by maintaining roads and trails where needed.
6. Utilize timber products as appropriate to help offset the cost of forest management activities.
7. Use low-impact logging techniques when thinning or harvesting timber.

I. Forest Health

A definition of a healthy forest for this landscape, under its current ownership is: a forest which provides a high level of ecological function, is resilient when faced with natural disturbances such as wind or fire or insects, is resistant to seasonal drought and the effects of climate change, and retains its ability to renew itself through natural regeneration.

The Eagle Lake property was logged extensively around the turn of the last century, then again around the 50's and 60's. Salvage and additional harvesting also took place after the windstorms of the early 1990's. Past logging, like most of the logging in the San Juan Islands, was purely extractive with little regard to future forest health or productivity. Merchantable trees were cut, slash was often burned, and everything else—damaged or not—was left in place. This logging style is known as **highgrade logging** and when conducted repeatedly, leads to a steady decline in forest productivity and health.

Currently, much of the subject property is dominated by young, somewhat overstocked conifers. Hemlock and Douglas-fir are the two most common species with hemlock comprising most of the smaller size classes (seedlings and saplings); in some of the wetter sites with a north or northeast aspect, hemlock has established itself in unusually thick and dense groves. Douglas-fir, which continues to establish in sunny locations where new ground is opened, is one of the longest lived and most resilient species—thus one of the most appropriate species for this site. Red cedar is also a long lived species and should be promoted in favor of hemlock in shady locations or sites with access to greater soil moisture.

In general, promoting well-spaced Douglas-fir and red cedar should be a priority for long-term forest health (Sitka spruce could also be a favored species in shady moist areas but it will likely be a very minor component of most stands). Hemlock and grand fir (white fir) will tend to dominate much of the understory as they establish well in shady conditions where the organic matter content of soil and duff is high. There are species which should be heavily thinned as they are not long lived and tend to produce high quantities of fuel when they become overcrowded.

Disease

Although a thorough inventory was not completed for the subject property, problems associated with forest diseases appear minimal. We noted one small (~0.3 acre) pocket of root rot near the north end of Wood Duck Lane. The types of pathogenic fungi that are likely causing the root rot are laminated root rot (*Phellinus weirii*) and Armillaria (*Armillaria spp*). These two fungi target Douglas-fir, grand fir, and hemlock, and both types can aggressively transmit infection through root-to-root contact and are capable of a rate of expansion of about 1 foot per year. Both types also survive in a latent state in old stumps and transition to their aggressive stage once they come into contact with live roots. The rate of infection is often correlated with other forms of disturbance (e.g., insect mortality, damage from heavy equipment or livestock) as well as drought.

Laminated root rot and Armillaria root rot are native fungal organisms that are common in the Pacific Northwest. In the natural development and maturation of Douglas-fir forests these pathogens have a functional role. They increase in abundance with stand age and tend to be the drivers of small to medium sized canopy gaps, thereby helping to initiate natural regeneration and spur habitat diversity. At times, however, these diseases can cause significant damage to merchantable timber and create hazard trees situated close to roads and property.

There are two options for mitigating the damage caused by root rots. The first method involves removing all stumps and large roots of infected trees. This is an aggressive approach primarily used on industrial timberland with short rotations using clear-cutting methods. The second option involves a combination of frequent monitoring and disease pocket mapping, salvage logging where appropriate, and perhaps the planting of resistant species (e.g., western white pine, alder, and/or bigleaf maple). The current level of root rot infection is considered to be very low and not a significant problem at this time. Future monitoring of the noted and other new infection pockets is recommended.

Insects

No major insect problems were identified.

II. Fire Hazard Reduction

This plan addresses fuel reduction strategies for the community property, not individual home sites. It is important for community members to understand that a key part of an overall fire-safe environment involves assessments and, in most cases, extensive mitigation work to the landscape immediately surrounding buildings (from 100-300 feet in all directions from the structure). This critically important component of hazard reduction is unique to each building/home site and outside the scope of this plan.

Uncontrolled forest fire is a threat to most forest land in San Juan County. The Eagle Lake property is of heightened concern because of topography (most structures are on top of hills or ridges with thickly forested slopes below), medium to high fuel loads, and the abundance and wide distribution of houses and other structures. Two of the best methods to help prevent disastrous wildfire are: 1) managing hazardous woody fuels in key areas, and 2) providing vehicular access and turn around space for fire suppression equipment.

Hazardous fuels management, when addressed on the scale of Eagle Lake's large acreage, should be focused along roads and driveways. Lowering fuel loads throughout all the forested acreage would not only be very costly but also is not needed at every location due to the variety of stand types and levels of woody fuel. The most probable ignition sources include cigarettes, campfires, house fires, vehicle fires, and lightning strikes. All but lightning strikes are virtually guaranteed to originate from areas very close to roads and driveways. And because roads and driveways provide an excellent barrier to fire spread, enhancing the fire dampening effect of these "**fuel breaks**" with a fuel limited zone on either side of

these features ("fire breaks") is one of the most effective methods of lowering the risk of uncontrolled wildfire.

The concept of creating **fire breaks** (zones with limited woody fuels in order to slow or break the course of a fire) involves removing fine fuels, small diameter fuels, and ladder fuels (see **fuels** below) from a particular area which a fire is likely to cross. Maintaining partial shade by leaving certain trees within the break zone is desired as this maintains higher localized humidity levels and also slows understory development. Ideally, a **shaded fire break** would extend 30-40 feet on either side of the road (buffer width).

Specifically:

1. For **shaded fire break buffers** along major roads (Forest Lane, Eagle Lake Lane, Georgia Strait Lane).
    a. Buffer should extend 25-45 feet on either side of road, measured from edge of pavement/gravel.
    b. 30 feet should be average width in areas with less than 15% slope. For more than 15% slope, apply a 45 foot buffer on both sides of the road.
    c. Retain low shrubs with lots of green (live foliage) such as salal. Cut and remove oceanspray, honeysuckle vines, and conifer seedlings (less than 10' tall).
    d. Select and shade trees (retained trees) and prune up branches to 12-15 feet off of ground. Any limbs hanging over the road should be pruned to 15 feet.
        i. Good shade trees (from best to least desirable): Douglas-fir, cedar, alder, maple, pine, and hemlock that are 5" in diameter or greater.
        ii. Shade trees should be spaced so that the tips of their crowns are not touching each other but the overall canopy space is 2/3 occupied (less than ½ occupied = too much light reaching understory).
    e. Cut and remove all but selected shade trees from buffer area, including ladder fuels that may be growing next to shade trees.
    f. If areas have insufficient trees to provide shade, plant Douglas-fir or cedar in browse protective tubes (Tubex 5' tubes are ideal) to quickly establish properly spaced shade trees.
    g. Eagle Lake is a massive fuel break itself and roads that pass along the shore need not be treated with a fire break on the side facing the lake. Small wetlands may be treated in a similar fashion. Start work on high priority areas first (roads with dense concentrations of fine fuels and branches in areas that receive lots of traffic).
2. For minor access roads and driveways (Coastline Drive, Raven Lane, Sunrise Bluff, etc.) or areas where additional screening is desired, implement the above but reduce the average buffer width to 20 feet in areas with less than 15% slope. For more than 15% slope, apply a 35 foot buffer on both sides of the road.

Along with thinning and harvesting, installing the shaded fuel breaks will lead to an abundance of fuels and slash. There are several options for safely dealing with this material including chipping, burning, and lop-and-scatter. **Chipping** is one of the fastest ways to treat woody fuels and slash. A large or medium chipper (9-12") can handle full-length limbs and tops of trees efficiently. Chipping is most appropriate in areas close to roads or the edge of openings. The over-application of chips to the forest floor (smothering) should be avoided in areas other than short distances from roads and openings or mulching projects around individual trees and paths.

Burning small slash piles during the wet season is an inexpensive and effective method of reducing fuel loads. Piles should be constructed during management operations, avoiding large layers of debris across the forest floor. Piles should be made early in the season to allow for partial drying and covered with tarps or burn paper to facilitate clean, hot burning. Piles should not be burned until the ground around them is saturated and weather conditions are cool and wet. Keep the size of the piles manageable (10-20' in diameter) and within 100 feet of access roads.

Lop-and-scatter is a method of dispersing smaller sized slash throughout the forest in order to achieve rapid decomposition. Slash should be cut so that when it is scattered it lies as close to the ground as possible (within 8 to 12 inches of the ground). When properly done, this method can be an attractive and effective means of treating slash. If the cut slash is not adequately dispersed, or if too much material is applied to a particular area at once, this method can increase the fuel hazard. This method is not recommended for inside the fuel break buffer area but can work well in adjacent forestland.

Fuels.
Not all woody fuels are alike. In a typical Douglas-fir forest, much of what is considered "woody fuel" (essentially all woody biomass above ground) is not hazardous and often does not warrant management actions. In general, the types of fuel to be concerned with are the following:

- *Fine fuels:* Fine fuels include grasses, needles, and small twigs up to ¼ inch in diameter—all of which dry out very quickly and burn hot and fast. Fine fuels are most abundant on the edge of clearings and next to buildings.

- *Small diameter branches:* Material larger than fine fuels but less than 3 inches in diameter (usually the bulk of logging slash and blow downs). Once dried, it can be a major source of fuel for wildfires. When accumulated to high levels, this is the type of fuel that can feed fires enough to initiate the transition from surface fire to partial crown fire—an extremely dangerous situation.

- *Ladder fuels*: Ladder fuels are most commonly small live trees that grow underneath and close to mature trees, creating a continuous vertical arrangement of fuel from the ground into the canopy. Ladder fuels can also include low sweeping limbs on mature cedars, dead trees, vines, and tall

shrubs. Shade tolerant species like hemlock and grand fir can lead to heavy ladder fuel burdens in un-thinned stands.

- *Old-growth trees and snags:* These landscape features pose a unique problem. In our dry climate, snags and old-growth trees contain numerous pockets of decayed wood and resin. When fires are present (either from controlled brush fires or uncontrolled wildfire), embers can land in these regions and cause a very rapid change to the fire environment. Because of their ecological value, removal of these enduring features is not recommended. Rather, managers should be familiar with their locations and use extreme caution if and when fires are in the area.

III. Hazard Trees

Hazard trees are trees that exhibit obvious defects or are growing in such a way as to increase the probability of causing harm to people or property. An obvious hazard tree would be a tree with a dead top or hanging large limbs growing next to a house. Hazard trees on the Eagle Lake community property are trees that have an increased chance of falling across roads or damaging community property. We noted a large number of hazard trees on the subject parcels, most of which were damaged or declining alder and damaged hemlock. Both species decay rapidly and are highly susceptible to breakage. Alder in particular is not a long lived tree and is known for failing (breaking) during calm weather. In order to maintain safe roads and trails as well as keeping escape routes open for emergency vehicles, follow these guidelines for identifying and removing hazard trees:

1. Trees with a lean over the roadway/path that is greater than 20%.
2. Trees within one tree-length of road/path that exhibit
    a. Obvious wound or decay anywhere along its stem
    b. Dead or dying top
    c. Lifted roots or other signs of tipping
3. Consult an arborist or tree risk assessor if unsure.
4. Hire only professional arborists or loggers to conduct removals, and consult a forester to determine if a permit is needed.

IV. Conducting Forest Thinning and Harvesting

Thinning or harvesting timber on Eagle Lake community property at a scale beyond the normal maintenance level will require a certain level of planning. However, the benefits of scaling-up may be well worth the effort as, in certain cases, the cost of the work may be substantially offset or even paid for through the sale of the removed products (sawlogs, firewood, or chips). Along some of the roads plagued with high numbers of hazard alder trees, for example, the alder logs are likely worth $1,500-$2,500 or more per log truck load at a mainland mill (rough estimate of current prices, 3/2012).

Hemlock and Douglas-fir sawlogs will not fetch the same price but may still worth marketing if their removal fits in with the overall goals of the property.

Once a potential project has been identified, the landowners will want to seek the advice of a forester. The forester will determine if a **Forest Practices Application** is needed (permit needed if harvesting more than 5,000 board feet per year) and assist with the necessary resources protection buffers and setbacks. The forester will also help guide landowners through selecting the most appropriate and low-impact harvesting methods and reviewing the logging contract. In a selective thinning operation where the smaller diameter trees are being removed, the forester may decide to mark paint on the selected trees throughout the whole unit. This makes for more a predictable outcome and is generally preferred by most loggers.

Equipment and logging method selection is determined, in part, by the conditions in the stand, such as tree density, slope, and soil type. Also, given the small size of most of the logging projects on Orcas, we are limited by what is available locally. Tracked skidder, wheeled skidder, and shovel (excavator) logging are the tree most common types of logging. Each has its limitations and particular set of impacts. The most important factor with any of these methods is having a competent and careful operator.

The most likely commercial harvest for the Eagle Lake property will be selective thinning with clear stand improvement and fuel reduction objectives. Because thinning has such wide interpretations and some common misunderstandings, I have provided the following general information on proper silvicultural thinning and how to go about assessing the need to thin:

Thinning is one of the most important and arguably underutilized forest management treatments and if done properly can increase the health and value of the forest and reduce potential fire risk. Thinning is an important treatment for young stands and overstocked multi-aged stands. Timely thinning increases growth and enhances overall stand health and vigor. It is a silvicultural application that concentrates volume production on those trees with the most desirable growth characteristics and, in the long term, improves the quality of the timber and species composition. Also, by removing trees with defects or insect and disease problems, stand health is improved. The remaining trees grow at a rate faster than would be possible in an un-thinned condition. When combined with proper slash treatments, thinning can also greatly decrease the amount of hazardous fuels and drastically reduce the risk of catastrophic forest fires.

Thinning should be a priority in areas showing the greatest overall reduction in growth—stands that exhibit obvious signs of stagnation due to intense competition. Three good rules-of-thumb can be used to help assess which stands show signs of stagnation and should therefore be prioritized for thinning:

1. Stocking density in excess of 400 trees per acre;
2. Height to diameter ratio in excess of 100 to 1 (“spindly”);
3. Percent live crown less than 25%. (proportion of total tree height that is supporting a full live crown—mostly used to assess Douglas-fir).

Thinning-from-below is a method of reducing tree density while focusing mainly on stand improvement. This method of thinning could be much more broadly applied in the San Juans as so many of our forests are overstocked and experiencing signs of stress. The best example of a large stand of overstocked trees on Eagle Lake property is the stand north of the waste storage area and south of Tsuga Lane. This stand appears to have been growing for about 90 years and is dominated mostly by Douglas-fir and hemlock. It is overcrowded and showing signs of stagnation. A stand improvement thin-from-below treatment that targets the removal of 20-30 percent of the standing volume would open the stand up for increased vigor and growth, lower fuel loads, and speed its trajectory towards an old-growth /late successional stand. Tree density would drop from around 450 trees per acre to 200-250 trees per acre. It would also likely pay for itself or generate modest income, not to mention provide firewood and perhaps some additional recreation opportunities.

V. Wildlife Habitat

A complete wildlife inventory was not completed for this plan; however, we made a number of observations. Eagle Lake, wetlands, and seasonal streams are important places for a number of wildlife species including mammals, birds, and amphibians. Additionally, a number of high quality Douglas-fir snags are scattered across the property. Where these are not hazards to people and buildings, they should be left in place to provide forage and nesting habitat for birds and other species. High quality snags in this area are defined as standing dead trees larger than 16 inches in diameter. These types of snags can remain standing for decades and consequently, should be retained and protected. Additionally, larger diameter trees that are not merchantable should be left for future wildlife habitat. The most important management decision regarding the wildlife habitat will be the retention of the snags and large, down logs, and larger diameter trees.

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