HIGHGROVE

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FOREST STEWARDSHIP PLAN

Landowners:

Property Size:
30.0 acres

Legal Description:

Property Location:

Plan Prepared By:

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1. Objectives

Overview:
It is the intention of the landowners to research, develop, and document an ecological approach to land management that strives to protect and enhance existing ecosystems while combining constructed agro-forestry systems with sustainable timber production. The prime directive guiding all decision making will be the ultimate succession of the forested areas of the property to late seral conditions.

Documentation of this process is intended to provide a general model for ecosystem management that can be applied to other properties around the region. The assistance of and partnership with governmental and non-governmental organizations will be actively sought in order to combine efforts and share the results of sustainable land use management strategies. As the owners are also interested in public education and awareness of issues relating to sustainable resource management, efforts will be made to host workshops and seminars relevant to projects being developed on-site.

1.1 Short-term Objectives

- Protect Douglas fir reproduction from deer browse
- Enhance wildlife habitat and native plant biodiversity
- Begin establishing agro-forestry systems
- Purge property of decades of accumulated refuse
- Fortify and expand road and trail system
- Take preventative measures for pest/disease control
- Survey boundary lines
- Develop pond and wetland systems for wildlife habitat and irrigation

1.2 Long-term Objectives

- Develop wildlife corridors and attractor points
- Conduct varietal trials on high-value and alternative timber species
- Design for maximum fire protection
- Manage succession of forest towards late seral conditions
- Develop mixed-use agro-forestry systems
- Rehabilitate damaged wetlands and other surface water features
- Manage forest resources for sustainable harvesting as per FSC guidelines
- Enhance habitat for threatened and endangered plant and wildlife species
- Develop plan for management of non-timber forest products

2. Property Description

2.1 Acreage

The property consists of 30 acres in the NE quarter of Section 12, Township 15N, Range 5W, Willamette Meridian in Grays Harbor County, Washington. 26 acres are forested and taxed as designated forestland. The remaining 4 acres are comprised of fields and taxed at the highest rate.

2.2 Location

2.3 Accessibility

The property is accessible by vehicle via Harp Rd. which ends at the property's SW corner.

2.4 Topography

The topography of the property is heavily contoured with an undulating solar facing aspect of 8-30% slope. The maximum elevation of 400 ft. is reached near the top of a long, roughly East-West ridge and the minimum elevation of 220 ft. is found approximately half-way between ridge and valley in an unclassified stream bed in the NE corner of the property. A severe 30% slope divides the SE corner from the rest of the property (this SE corner is referred to as *the lower bench*). The entire NE corner of the property is comprised of an isolated South-facing valley.

2.5 Land-use History

In 1994 the previous landowner conducted a final conifer harvest of a predominantly Douglas Fir stand covering approximately 26 acres of the property. D-f seedlings were replanted in the harvested area the following year. According to local area residents the original forest was logged in the 20's and 30's. Second growth stumps with 60 - 70 rings confirm this fact. Collected

anecdotes from neighbors and past residents reveal of rich past of agriculture, turkey farming and moonshining. A field of approximately 10 acres was cleared of old-growth stumps in the mid ‘40's.

2.6 Current Conditions

The 26 forested acres were replanted entirely to Douglas fir in 1995 following a final conifer harvest the previous year. Small isolated patches of alder, Western red cedar, and bigleaf maple occur throughout the regenerating forest with the greatest concentrations occurring along the South and East boundaries. The Douglas fir saplings competed with a mix of pioneer species including field grasses, sword fern, trailing blackberry, Himalayan blackberry and alder. Bigleaf maples are randomly scattered across the lower bench and stumps of this species cut during the 1994 harvest are coppicing profusely. The remaining 4 acres are comprised of mixed grasses and forbes. Some natural regeneration of Douglas fir and alders has begun along the edges of the fields. Alder thickets have sprouted along most roadsides and on abandoned roads. A small pond (approximately 12' in dia.) was dug sometime prior to the recent harvest approximately 75' down the western most unclassified stream valley. This pond has since silted in and functions more as a small wetland.

Two dilapidated buildings (a plywood cabin and barn) once sat in the SW corner amidst a couple acres of scattered refuse and barbed-wire fences. Both buildings and all refuse and fencing have since been removed. From this same corner a phone and power line enters the property paralleling the driveway.

Noxious weeds on the property include: Himalayan blackberries, thistle (species as of yet unidentified) and random occurrences of individual scotch broom.

2.7 Surrounding Land Use

The property is bordered to the south and east by state forestland. The state forestland is an even-aged Douglas fir plantation approximately 15 years old. Property immediately to the west is privately owned and densely forested with a second growth forest of mixed hardwood and conifer species approximately 60 years old. To the north John Henrikson’s property, comprised of an uneven aged forest mixed species.

3. Resource Description & Recommendations

3.1 Resource Category I: Forest Health

The replanted Douglas fir forest has experienced approximately a 90% survivability rate, with random pockets of mortality where field grasses and occasional alder and low trees and shrubs have gained a foot hold. The Douglas fir is an average of 12' – 18' tall. Black spots are common on the underside of the needles of most of the Douglas-fir indicating the presence of Swiss needle-cast. Despite the infection, the growth rate of the Douglas-fir is robust as annual leaders measure on average 3'-4'.

A large patch of red alder on the lower bench was severely damaged by the '96 ice storm resulting in numerous living snags and a multitude of fractured tops to the trees.

Himalaya blackberry patches are scattered about the forested area and predominate along the fence line on the western side of the property. Individual blackberry plants are scattered throughout the alder thickets and Douglas-fir areas. Tansy and an unidentified thistle species occur randomly around the property with the greatest occurrence in or around the edges of the field.

Deer browse is significant on newly planted trees, both native and non-native agroforestry species.

State lands to the south may present a fire vector due to their dense planting and the formation of fuel ladders as lower branches on the Douglas fir begin to die.

Resource Protection Measures

Prevention of deer browse will be of paramount importance in the near future for all newly planted trees and shrubs. A variety of fencing strategies will be employed including individual tree cages and fencing large patches of newly planted trees. Over time, wildlife corridors and attractor points will be designed to carefully manage the movement of deer through the landscape.

The damaged alder grove will be thinned heavily to remove most leaning, fractured, and otherwise non-commercially viable trees. Select snags will be left for wildlife purposes. Felled trees will either be removed for firewood or left on the ground as nutrient source.

Blackberries, tansy, scotch broom and thistle will be gradually removed over time. Limited

chemical applications may be made on persistent patches of blackberry.

No control is planned for swiss needle cast as the disease does not seem to prevent a hindrance to the growth of the Douglas-fir.

In order to manage forest health across the entire stand, the forest will be managed for mixed species and mixed age classes over time.

Management/Enhancement Recommendations

The principal intent of this forestry plan is to protect, maintain, and encourage the natural ecological cycles and wildlife habitat of the forest and field environments. The forested area will be managed for a successional return to late seral conditions. En route the forest will also be managed to encourage the growth of a diversity of high quality forest products.

In general, most significant management practices will take place in the seasons of least disturbance to soils and habitat. For instance, thinning will occur during dry seasons and outside of prime bird nesting seasons. To enhance the diversity of vegetation and to improve wildlife habitat, additional native plants and tree species will be introduced to the property.

Mesic sites will be replanted to black cottonwood, cascara, willow, Oregon Ash, black hawthorn, bitter cherry, red elderberry, salmonberry, indian plum and other relevant species. Dry sites will be replanted to blue elderberry, beaked hazel, service berry, currants, thimbleberry and other relevant species.

3.2 Resource Category II: Timber & Wood Products

Aside from the 12 year old Douglas firs, a significant number of large trees occur throughout the reforested area. These tree species include bigleaf maple (DBH 24"-36"), Western red cedar (DBH 25"-35"), and red alder (DBH 6"-15"). The following tree species also occur but with much less frequency: hazelnut, western hemlock, black cottonwood. Perennial ground cover and understory species include: sword fern, trailing blackberry, red elderberry, red-flowering currant, Oregon Grape, and red huckleberry.

Resource Protection Measures

All standard management practices will be conducted in a manner that is most protective of forest health and wildlife resources. WA State forest practice rules will be followed regarding buffer requirements around wetlands and seeps.

Management/Enhancement Recommendations

Pruning of Douglas fir began approximately three years ago with the lower limbs being lifted to an average of six feet. This practice will continue through the majority of the stand. Future prunings will gradually lift the lower branches to even saw log lengths (8', 16', 24', etc.) depending on the character of individual trees. Gradual pre-commercial thinnings will begin in

approximately 8-10 more years. Trees will be thinned on an individual tree selection basis. Thinning will focus on producing quality logs and snag and wildlife tree retention as appropriate. Thinned trees and limbs will generally be left as downed debris (by either scattering debris or stacking into wildlife piles) for wildlife and soil enhancement. The mature big leaf maple and Western red cedar will not be harvested in order to maintain species diversity.

To increase the diversity of commercial tree species, various sites will be replanted to Western red cedar, Western hemlock, black cottonwood, cascara, and Oregon Ash.

3.3 Resource Category III: Soils

The property is entirely comprised of Centralia loam on an 8-30% slope. Soils are generally well-draining although overland vernal water flow occurs in natural swales during periods of heavy rain. Vernal standing water also occurs in one area on the lower bench where fill and compaction has disrupted the natural drainage capacity of the soil. The soils capability unit is IVE making it well-suited for timber. Douglas fir is the principal forest species with other trees of limited extent including: red alder, western red cedar, western hemlock, and bigleaf maple. On the basis of a 50 year site curve, the mean site index for Douglas fir is 135 with a mean growth-rate of 191 cu. ft/acre/year.

Resource Protection Measures

The overall health and stability of the soil on the property will be maintained by protecting and enhancing the health of the forest through measures such as planting native vegetation and leaving the majority of downed wood in place. Slope stability and erosion are of minimal concern except where road cuts occur. In the instances where steep cuts have left bare slopes, vegetation management will be necessary. This will include: removal of sprouting alders and replanting of erosion controlling native plants such as sword fern, salmonberry, thimbleberry, red osier dogwood, and other species. Where erosion is occurring along roads, waterbars will be constructed to channel surface water to ditches on either side of road. Compaction of soils by vehicular traffic will be prevented by limiting traffic to dry seasons and existing roads. No chemicals will be used for either vegetation management or fertilizing.

Management/Enhancement Recommendations

Aside from leaving most vegetation and downed wood in place, no other soil enhancement measures will be taken. Future roads will be constructed on contour and immediately reseeded to grasses and legumes to prevent any subsequent erosion.

3.4 Resource Category IV: Water Quality, Riparian, and Wetland Areas

The property has no classified wetlands. One Type 9 stream and three unclassified streams begin

on the property and there is evidence that two of the unclassified streams have been altered at their source at some undetermined time by either artificial ponding or filling, depending on the site. All streams on the property are seasonal, but result in annual flow a short distance below the property line. Vernal surface water is common late October through early May with surface flow occurring within natural swales. The westernmost unclassified stream has had a pond developed 75' downstream from its source. This pond has silted in and now functions more as a wetland.

Resource Protection Measures

Given that the property sits high in the landscape profile and that a tremendous volume of water has been observed to flow both subsurface during summer months and overland during winter months, it has been determined that this area presents a high recharge capacity for the watershed below it. With the exception of limited chemical applications for blackberry control, only organic supplements and methods will be employed in both forestry and agroforestry sites.

Management/Enhancement Recommendations

In order to enhance this recharge capacity the immediate reforestation and subsequent shading of the area surrounding stream valleys will be made priority. Equally, natural swales will be enhanced ponds dug and wetlands restored in order to collect and hold water higher in the landscape longer into the season. Any enhancement activities to roads or landscape that encroach upon any of the streams will be undertaken only in the dry months.

3.5 Resource Category V: Fish and Wildlife Habitat

As the forest regenerates, it is naturally diversifying itself. This diversity supports a significant variety of bird and wildlife species. As the principal intent of this plan is ecosystem restoration, the design for wildlife habitat is a priority factor. Wildlife species common to this area are: coyote, black-tailed deer, elk, raccoons, and occasional sightings of cougar and black bear. Bird species known to be common in this area are: wild turkey, barn swallows, ruffed grouse, woodpeckers, hawks, starlings, and hummingbirds. Although there is no fish habitat on the property, enhancement of the site's recharge capacity via reforestation will help ensure a more stable hydrology lower in the watershed.

Important wildlife forage species found on site include: red huckleberry, Oregon Grape, sword fern, red elderberry, Douglas fir saplings, bigleaf maple suckers, foxglove, hazelnut, grasses, trailing blackberry, and red alder.

In order to develop a site specific plan for enhancing wildlife habitat the first stage of design will involve a detailed inventory of species occurring on this site. This inventory will take into account seasonal patterns of wildlife habitation and use including: plant forage species, types of cover utilized, patterns of movement through landscape, and other relevant observations.

Resource Protection Measures

The only changes that will be actively introduced to the reforested areas will involve thinning operations as the Douglas fir mature; clearing of foot trails; and planting additional native trees, shrubs, and herbaceous perennials. Slash piles left behind from the 1994 conifer harvest will be left to provide wildlife habitat.

Management/Enhancement Recommendations

The variety of native plants will be increased to enhance floral and fauna diversity across the property. Trees, shrubs and herbaceous perennials such as snowberry, red huckleberry, oceanspray, red and blue elderberry, thimbleberry, hazelnut, currants, bitter cherry, serviceberry, red-osier dogwood, ceonothus, wild rose, hawthorn, cascara, and other species found to be attractive will be planted to provide additional food and shelter for wildlife. Birdhouses and nest boxes will be placed randomly across the property to provide further habitat for bird species. Roosting poles for raptors will be erected in the Douglas fir reprod. in order to provide a natural control for field mice and other rodents inclined to nibble on saplings.

In order to protect the Douglas fir saplings, feeding corridors and attractor points will be created for the deer population. Measure taken will include: cutting back coppice bigleaf maples to create new suckers, seeding roads to clovers and trefoils, providing denser populations of deer browse species in areas not replanted to Douglas fir, and providing salt licks in areas not replanted to Douglas fir.

Additionally, ponds and wetlands will be designed in areas not replanted to Douglas fir in order to provide a source of surface water for wildlife.

Habitat enhancement will be considered for specific wildlife species (e.g. band-tailed pigeon, wild turkey, deer, etc.) and plant species (e.g. wetland, rare habitat types).

3.6 Resource Category VI: T & E Species and Cultural Resources

There are no known threatened or endangered species currently existing on the property, nor have any cultural or historical sites been identified. However, in accordance with the principal intent of this plan to restore this site's ecosystem, research will be conducted to determine if any threatened or endangered species occur in the surrounding area. If threatened or endangered species are found to occur in the surrounding area, measures will be taken to determine the efficacy of promoting habitat for them on the property.

The band tailed pigeon is a species of concern in the area. Over the past two years, an NRCS Wildlife Habitat Incentives Program grant has been obtained to enhance approximately 2 acres of forest edge habitat for the pigeon. Native tree and shrubs species that produce mast have been

introduced to the select sites. These species include: bitter cherry, oak, serviceberry, red huckleberry, native rose, Indian plum, etc.

3.7 Resource Category VII: Aesthetics & Recreation

The heavily contoured landscape on the property and its location towards the top of a ridge lends endless viewpoints and visual surprises to the casual hiker. To the east Mount Rainier can be seen, and to the south a deep valley yawns. The property to the north is owned by a close friend and boasts miles of trails through a diverse forest and terrain.

Resource Protection Measures

Roads will be maintained to provide ready access to most points on the property. These roads will be allowed to grass over or will be seeded where natural revegetation does not occur thus creating a soft foot path for walking along. As certain wildlife populations have been hunted to near extinction in the surrounding area, measures will be taken to insure that the property serves as a sanctuary for these animals.

Management/Enhancement Recommendations

Foot trails will be constructed to provide more casual access to areas of the property where wider roads are not appropriate. In addition, the transplanting of additional native tree and shrub species onto the property will further extend the aesthetic value by attracting greater numbers of wildlife. The viability of broadcasting wildflower seeds along roadways will also be researched.

3.8 Resource Category VIII: Agro-forestry and Special Forest Products

The property has significant potential for the production of special forest products and agroforestry development. The owners will explore a broad range of opportunities for producing and marketing high-value non-timber forest products such as edible and medicinal mushrooms, native plants, specialty woods, small diameter wood and others.

Agro-forestry is of great interest to the owners and the development of constructed agro-forestry systems will be prioritized in the early years. The four acres of field will be dedicated to an *Agroforestry Zone* intended to produce food crops and high-value agroforestry species. The species selection may include non-native trees and shrubs.

One acre in the SW corner of the property has been dedicated to bamboo production. The bamboo will be grown for edible shoots, poles, and timber and fiber products. Another 1.5 acre site 100 yards east of the bamboo plantation has been chosen to be designed as a *food forest*,

combining fruit and nut trees with understory shrubs and perennial herbs. Alternative timber and small diameter wood species will also be planted along the margins of roads primarily at the edge of the large meadow. These timber species will include a selection of native and non-native trees.

The assistance of and partnership with government and non-government organizations will be actively sought in order to combine efforts and share the results of this research. Currently the owners are cooperating with the Washington State University Cooperative Extension Office to conduct research on bamboo pole and shoot production.

All agroforestry and non-native species will be kept to the non-forested areas of the property. They will be closely monitored for growth characteristics and potential for spreading.

3.8.1 List of Agroforestry and Non-native Species

Bamboo
All bamboo is located in SW corner of property adjoining the driveway. Varietal trials of bamboo are being conducted to gage its productive potential as a high-value agroforestry species. Approximately 20 unique varieties of bamboo are being grown with the intent to acquire additional varieties.

English basketry willows (Salix spp.)
A small grove of traditional English basketry willows has been established in the SW corner of the property near the gate. Approximately 12 unique varieties of willows are being grown. Varietal trials of the willows are being conducted to gage their productive potential as high-value agroforestry species. The willows will be coppiced for use in the manufacture of baskets, containers and artistic creations.

Black locust (Robinia pseudoacacia)
Currently only four black locusts have been planted along the easement road that leads to the state forestlands. However, additional locusts are planned for the bamboo plantation to serve as nitrogen fixers and a nurse crop to the bamboo. Locusts will be grown for both sawlogs and coppice for fence posts.

Sugar maple (Acer sacchurum)
Sugar maple have been planted in the SW corner of the property towards the bottom of a recently constructed swale. The maples have been planted for both aesthetics as well as the potential production of maple syrup. Approximately 20 sugar maples have been planted.

Birch
Two varieties of birch have been planted in the SW corner of the property. The birch have been planted on either side of a newly constructed swale. The birch have been planted primarily for aesthetic purposes.

Black walnut (Juglans nigra)
Currently only three black walnuts have been planted either amidst the basketry willows or along the driveway. However, the landowners intend to plant significantly more black walnuts for both short-term nut and long-term timber production. All black walnuts will be planted in the agroforestry zone at the SW corner of the property.

Eucalyptus
Five eucalyptus trees are currently growing within the SW corner of the forested area of the property. These trees will be transplanted to the agroforestry zone in order to keep the forested area free of exotic species.

Eastern Oak (Quercus spp.)
Several varieties of eastern oak have been planted along the driveway. Additional varieties are expected to be planted in the agroforestry zone over the next five years. The oaks are being grown for both aesthetic, timber and nut production.

Fruits and nuts
A wide variety of fruit trees, shrubs and vines are planned for the agroforestry zone. Currently one apple tree, several plums and the aforementioned black walnut are the only non-native food bearing trees on the property. All are located in the agroforestry zone.

4. Management Timetable

4.1 Schedule for Forest Management Tasks

A timetable of forest management practices for the next 10 years is provided in the following chart. A summary of tasks to be prioritized include the following:

Years 1-5

- Complete wetland, pond and pigeon habitat restoration practices
- Develop comprehensive monitoring plan for forest development, timber and non-timber forest products and wildlife species
- Begin construction of workshop and dwelling
- Install windmill for irrigation and human use

Years 5-10

- Begin pre-commercial thinning of Douglas fir
- Begin commercial thinning of alder

Ongoing

- Prep and plant additional agroforestry sites
- Continue infilling and diversifying native plant species within forested area
- Continue pruning Douglas fir
- Prune and thin alder thickets to select for timber quality
- Identify and harvest non-timber forest products
- Inventory wildlife and plant species.
- Maintain forest roads. Reopen spurs.
- Build new foot trails
- Remove noxious weeds
- Begin hosting public tours and workshops

5. Monitoring

Currently the monitoring program for this property is comprised of a process of observation, photo documentation and note taking. Aspects of the forest that are currently being monitored include:

1. Location of noxious weed species
2. Growth of primary timber species (Douglas fir and alder)
3. Effects of pruning on primary timber species
4. Pest, disease and animal damage to primary timber species
5. Abundance of non-timber forest products
6. Growth of agroforestry species
7. Growth and succession characteristics for restored wetlands and band-tailed pigeon habitat.

Over the next five years, a more comprehensive monitoring program will be developed and implemented on the property. This monitoring program will be informed by the standards established by Northwest Certified Forestry's group certification program criteria. Permanent monitoring plots will be established which will include photo-points, species indexes and current stand characteristics. The monitoring program will include the aforementioned attributes as well as the following attributes:

1. Numerical growth and yield calculations for primary timber species
2. Identification and quantification of primary non-timber forest products
    a. Locations of NTFP's will be mapped
3. Identification of wildlife species utilizing forest habitat
4. Identification of primary plant species
5. Temperature readings (ambient air and soil)