

INTRODUCTION

This is the forest management plan for the 20.31-acre forestland called the Bonnie Brae and Reddick Forest on Orcas Is.

OBJECTIVES

This plan will guide the management of the Bonnie Brae / Reddick forest property to support the long-term management goals of the owners. You, the owners of the Bonnie Brae housing cluster and Reddick forest, want to manage the forest so that it remains healthy, is full of diverse species, produces valuable wildlife habitat, protects the watershed, and allows you to harvest timber, if you need it, in a sustainable manner with minimal environmental impact and degradation. You also desire to create and maintain access trails that will allow not only forest access for thinning and wood removal but recreational access to the the forested portions of the property thus allowing and adding to the esthetic qualities of your forestland while creating fire protection buffers.

You have little or no interest in commercially harvesting the forest other than selective salvage harvesting for personal use and thinning to increase forest stand health. In the effort to move towards these desirable goals you also wish to control noxious and invading weeds and tree species found in the forest or forest edges were previous disturbances have allowed them a chance to move in. There are also desires to have small livestock and food production areas irrigated by available seasonal water collected during the wet months.

DESCRIPTION OF CURRENT CONDITIONS

Location

This forest property lies on the northwestern edge of the East Sound Watershed on Orcas Island. It is located adjacent to and northwest of the East Sound village located in part of the NW Quarter of Section 14, T 37N, and R2W. The physical addresses for the housing cluster are Bonnie Brae Lane and the OPAL office on the corner of Enchanted Forest Rd and Lover's Lane. The property consists of two land parcels with a combined total of 20.31 acres in size (see forest management plan map, section 3). The Bonnie Brae housing cluster has been on the west parcel for about 18 years. For management considerations the forest property has been designated into four resource areas. These areas will be described in the inventory section of the narrative.

Size

Area 1:	4.26 acres,
Area 2:	5.95 acres
Area 3:	5.0 acres
Area 4:	5.1 acres
Total acreage all resource areas:	20.31 acres

Soil

The property contains two main soil types: 1010—Deadmanbay-Morancreek complex, 2 to 15 percent slopes, 3013—Everett sandy loam, warm, 3 to 20 percent slopes, see soil report in section 3.

Map unit: 1010 – Deadmanbay-Morancreek complex, 2 to 15 percent slopes

The **Deadmanbay** component is drainage ways, or valleys with a concave shape. The parent material consists of glacial drift over dense glaciomarine deposits. Depth to a restrictive layer (dense material) is 40 to 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is moderately high. Depth to water table is 4-12 inches. Non-irrigated and irrigated land capability classification is 4w.

The **Morancreek** component is on mountain slopes and hillsides with a landform position on foot slopes and or mountainbases. The parent material consists of glacial drift. Depth to a root restrictive layer is more than 80 inches. The natural drainage class is moderately well drained. Water movement ability is high. Available water to a depth of 60 inches is low. Shrink-swell potential is moderate. The depth to water table is 16-28 inches. Non-irrigated land capability classification is 3w. Irrigated land capability classification is 4e.

Map unit: 3013 - Everett sandy loam, warm, 3 to 20 percent slopes

This component is on hill slopes is linear in shape and the parent material is glacial outwash. Depth to a root restrictive layer is more than 80 inches. The natural drainage class is somewhat excessively drained. Water movement in the most restrictive layer is high. Depth to the water table is 80 inches or more. Shrink-swell potential is low. This soil is not flooded. It is not ponded. Nonirrigated land capability classification is 4s. Irrigated capability classification is 6e.

Water

Ground Water

The Bonnie Brae housing cluster and the OPAL administrative and housing cluster are both on the Eastsound Water System. There is no known well on the parcel.

Surface Water

Wetlands are evident and cataloged in the eastern portion of the Reddick parcel. There are no roadside ditches to handle rainwater runoff on Bonnie Brae Lane and sheet flows handle most of the rainwater drainage coming off of impervious roof surfaces and driveways. This has created problems both for down slope runoff direction and excess soil saturation across down slope housing parcels. There is a strong indication that down slope septic systems have been compromised by excess surface and sub-surface

run off during the winter months. Some of the runoff coming from the uphill locations to the west is captured by a culvert and routed to a pond that is to the east and down slope of the housing cluster. This pond may have a water seal problem. The water level is highly variable often dropping rapidly after filling.

Animals and Wildlife

Species

In addition to the types of wildlife you would expect to find in this type of forest, the following animals have been observed: a hawk (suspect it to be a red tail), eagle(s), screech owl(s), Raven(s), Crows(s), Downy woodpecker(s) and various other indigenous and migratory song birds within the general vicinity of the property. No livestock are on the property and there are no grazing lands.

Habitat

The forest currently provides medium to good habitat for local wildlife. The forest diversity is low in the eastern sections with an under story of water loving native species. Some portions of the site have more downed woody material than others. This downed woody material provides habitat for feeding, nesting, reproduction and travel routes. A maintained trail provides access to the southern side of the forest running west to east. Few if any forest openings are evident as most of the under story is filled with overcrowded Red alder and dense stands of spindly Douglas fir.

Vegetation

There are no known locations of Significant Natural Features (rare plants, high-quality ecosystems, or rare animals) on your property but there are areas in the nearby sections that were indicated as Bald Eagle habitat and wetlands; verified on 1/07/11 by Chuck Natsuhara, NRCS, reviewing the Washington Natural Heritage Information System list of Priority Habitat Species in San Juan County.

Historical use

The parcels both show a history of selective logging with large rotting stumps spread throughout the forest. The last recorded logging of the area was the horse logging done in the Bonnie Brae housing area during development. This particular type of logging has resulted in little if any damage to remaining trees.

There may have been logging before that, but at an unknown time, as the general history of the island was one of massive tree harvesting. The ice/windstorm of 2005/2006 created significant blow-down trees and left several standing dead trees with snapped off tops.

Present condition Area 1

Comprised of an east-facing slope, this unit contains remnants of the original forest area comprised of second growth Douglas fir (DF) (*Pseudotsuga menziesii*), Madrone (*Arbutus menziesii*) and Western Red cedar (*Thuja plicata*). Native brush and plants

such as Oceanspray, native fern, Salal, Nootka rose, nettle, Highbush-Cranberry, Western honeysuckle, Elderberry, Snowberry, Mountain-ash, Red-flowering currant, willow, Oregon grape, Salmonberry and mosses fill the under story. Skid trails that historically accessed this area have since been allowed to grow back in or been converted to deer trails.

During our site-visit forest walk on 2/17/11 we did observe the presence of a noxious tree species and weeds. Scotch broom (a Class B noxious weed) was noted along with individual English holly (Ilex aquifolium) specimens that are beginning to infest the forest. Given time and no human intervention this species is known to create large monocultures thus crowding out other native species.

Natural reforestation was noted to be occurring predominantly around the larger Douglas fir and Western red cedar that remain from previous harvest events and sheltered areas within the forest floor.

Of all the areas within this forest, this one exhibits the most complex and diverse structure with many different sizes of trees, ages and species complexity. This leads to a more diverse list of related wildlife species and thus a desirable forest complex.

Species	# Of Trees/Acre	Average Hgt (ft)	Average Dia (in)	Avg. Age	Crown Ratio
Douglas fir (DF)	60	85	49	75	55%
Red cedar (RC)	10	75	28	75	65%
Madrone	30	60	63	85	25%
Avg. Total	258	73	51	78	48%

(Note: Crown ratio is a description of the percent of the tree that is green and growing)

Present Condition Area 2

Area 2 is comprised of a now converted, 5.95 forested area in which the Bonnie Brae housing cluster was constructed. Tree species noted in this area include the same species as noted above in the list for area 1 but with fewer trees due to pre-construction removal. The stand is composed of small blocks of trees, the majority of which are large Douglas fir and a few medium-aged Red cedar trees positioned within the upper northwestern portions of the housing area. Additional trees and shrubs such as Maple, Madrone, Red alder, Red elderberry, Himalayan blackberry, fern, Orange honeysuckle and Salal are mixed in. Douglas fir and Red cedar seedlings are found in some protected areas. Several large Red elderberry groves have died back probably due to excess surface water and old age. No inventory was done for this area. It appears that most of the larger remaining Douglas fir trees are healthy. Any specific fear of a tree being wind thrown into houses should be dealt with on a tree-by-tree basis. Any tree that shows a weakness and or symptoms of die back should be assessed by an arborist and only then removed for safety.

The far eastern, downhill portion of the housing area contains a small pond and several once forested areas that have been highly disturbed creating openings for several invasive species to take hold. The pond has Yellow flag iris, which if given the time, will completely fill this shallow pond. The pond may also have an issue with sealing as mentioned earlier. In order to be used, as an irrigation source for any agriculture, making sure the pond is well sealed with an appropriate clay layer or liner will be important. There are also small pockets of dense Douglas fir along Enchanted Forest Road that should be considered in any thinning action taken.

Himalayan blackberry, Scotch broom and Holly trees also occur on the edges of this area. SJC Noxious Weed Control Program staff that you have already worked with should coordinate all containment and control efforts. I encourage you to keep that relationship active and ask for their assistance in coming up with strategies that will allow you to control these species.

Present Condition Area 3

Area 3 is approximately 5 acres and covers most of the upper northern half of the combined forest acreage. It also contains a seasonal stream and delineated wetland containing very water saturated soils with seasonal sheet flow in low areas that moves water to the east and the roadside ditches of Lovers Lane. Because of the soil type and water movement from the upper western portions of the forest (on site and off) the species diversity is low, mainly water tolerant species and very dense. Red alder in large numbers and a sprinkling of Douglas fir occupy this section of forest along with a mixture of Devil's club, a water tolerant native. Extreme crowding of Alder and clumps of Douglas fir has reduced tree diameters due to the competition for light and nutrients. Several invading species of trees are also located in this area, Hawthorne and Holly. A sprinkling of native fern and invasive Himalayan blackberry rounds out the plant life present. An additional problem is wind thrown trees, mostly Douglas fir. Soils are very wet and as root systems are under developed and trees are weak due to the overcrowding, wind tends to bring down the weakened trees. A fixed area plot reveals the high level of crowding:

Species	# Of Trees/Acre	Average Hgt (ft)	Average Dia (in)	Avg. Age	Crown Ratio
Red alder (RA)	768	58	20	30	<25%
Douglas fir (DF)	192	55	28	50	< 35%
Avg. Total	960	56	24	78	48%

Present Condition Area 4

The final forest portion of interest is that of area 4. This area is 5.1 acres in size and located along the southeastern bordering Enchanted Forest Road. Conditions in this area mimic those found in area 3 but with more Douglas fir due to somewhat drier soils

that are located away from the seasonal drainage path and the wetland. This area also has a larger volume of invading tree species and plants, the same as mentioned above. Holly especially, is finding the growing conditions an advantage in this area. Clumps of dense monoculture are located amongst scattered individual Holly trees. Allowed to continue in this rapid colonization, this species will expand in volume and create a solid stand of Holly thus altering the forest diversity. A fixed area plot reveals the high level of crowding and the noxious invading species are included:

Species	# Of Trees/Acre	Average Hgt (ft)	Average Dia (in)	Avg. Age	Crown Ratio
Red alder (RA)	672	55	20	30	<25%
Douglas fir (DF)	240	55	28	50	< 35%
Nox. Species	+/- 48	15	6	15	68%
Avg. Total	960	41	18	31	42%

Air

No Significant air quality concerns are present.

Human

There are no known cultural resources on your property but direct hits were obtained in adjacent sections (verified on 1/07/11 by Chuck Natsuhara, NRCS, checking the County/State Cultural Resources List).

EVALUATION

Area 1 and 2

The current forest composition of both units reflects the naturally occurring conditions associated with the forest conditions that evolved in the given terrain, soil type and logging that occurred on site. Based on the soil type, **3013 - Everett sandy loam** the 2009 soil survey interpretation states that these soils are well suited for forest habitat. Natural reforestation was noted to be occurring predominantly in that portion of the remaining forest spared from previous harvest events or that has re-grown since. This is predominately the area uphill from Area 2, found in Area 1. Some young seedlings of Douglas fir and further north in Area 1 Red cedar were noted. Healthy middle age Douglas fir and fast growing Red cedar with Madrone mixed in is the predominant tree mix. This area also had a fairly intact mix of forest growing shrubs and ground cover. Of all the areas in this whole forest complex this is the portion that most reflects a desirable balance of forest resources that should be emulated and a desirable model to work towards.

The site visit indicated no noticeably severe areas of disease or rot. This is most likely due to the relatively advanced age of the existing trees and the lack of recent logging with heavy machinery. The use of gentle horse logging techniques used to harvest

mature specimens prior to construction of houses in Area 2 is evident. Trees in amongst the houses are in good shape because of this with little or no die back evident and because of well drained soil wind thrown trees should not be a major problem as long as trees remain healthy and actively growing.

Any future reforestation actions really are not necessary in either of these areas, as they seem to be doing this on their own. Any replanting of individual trees will be subject to opening up the under vegetation to allow sunlight into any potential open area. This will require seasonal maintenance in order to reduce competition from this surrounding vegetation, allow in sunlight and help you protect young seedlings planted with anti-deer protection guards.

The existing trails on both of the units are a key ingredient in future management plans. They should provide sufficient access to the stand to perform any intended forest management or for recreation and increasing the planting diversity through re-planting. These trails are also a desirable element of forest fire prevention.

Unit 2 shows more of the results of the historic logging because it is a larger site and more impacted by pre-construction and post construction human activities. The commercial timber harvest or salvage and development of the housing areas reduced the diversity of the stand. It is doubtful that the previous logging activities were followed by successful reforestation activities other than those of individual homeowners within the specific housing unit area.

Area 3 and 4

Overall, the forest in both of these areas is generally healthy but not without problems. As the soil type is different, **1010 – Deadmanbay-Morancreek**, the composition of the forest throughout these areas is very different. The soil type, the presence of water and past logging operations, has heavily impacted both areas. Current regrowth and the resulting fight for resources by regrowth is intense resulting in a crowded, weak and over stocked forest. Few remaining large and medium growth trees have been left and the spindly trees that are growing are also being impacted by invasive noxious species. The majority of resource concerns to be addressed and recommended management activities will be recommended for these two areas.

Habitat

Wildlife requires shelter, food, water, and space. Historical disruption of these areas likely altered wildlife habitat in this area through the conversion of large portions to crowded, water tolerant tree and shrub species with reduced diversity. Noxious species are also having a negative effect on habitat.

Native Plants

The appearance of non-native, invasive plant / tree species in Areas 1 and 2 has been mentioned and the same situation exists in Area 3 and 4 only worse. Both units have a

splattering of native shrubs, small trees and brush species as found in our local alder/coniferous forests but have been largely compromised by high competition and overcrowding.

Wind

The forest has been and will continue to be susceptible to blow-down in these areas. Salvage harvesting of blown down trees could meet the personal use timber goals for firewood for association members. Said harvesting would also assist in the management and subsequent opening of the forest for future re-planting and wildlife habitat. Should future harvest operations ever occur, caution should be exercised in opening the stand(s) excessively at any one-entry period and exposing the stand to excessive wind throw.

Insects, Disease, and Animal Damage

Deer use the property quite a bit, and seedling survival for any replanted species could be a problem. Seedling protection measures should be employed for any reforestation activities you undertake and are discussed under the animal damage control section. Disease and insect problems should be monitored continually.

RECOMMENDATIONS

In order to achieve the goal of managing your forest, specific recommendations have been developed for the management areas. To help this resource remain healthy, produce valuable wildlife habitat, protect the watershed, provide additional wildfire protection and allow residents to salvage timber in a sustainable manner with minimal environmental impact and degradation, said recommendations should be considered. Within each of these recommendations, various options for implementation are discussed. All recommendations shown below should lead to a healthy forest that will allow for particular sections of the forest to return to a viable, diverse stand. In addition these actions will over time protect against soil movement, provide foot access, increase forest esthetics, protect, enhance, and maintain wildlife habitat and decrease wild fire danger. These recommendations are given and combined as one alternative.

Area 1 and 2

It is recommended that any action(s) you take protect this part of the hillside and residential watershed that your property includes. If reforestation efforts are desired, it is recommended that you locate your planting sites next to the stumps of previously existing trees to elevate the seedling from the water table, and plant tree species that were previously present or harvested. For information regarding planting, please refer to **(Re) Planting Alternatives** beginning on page 13. Animal damage protection measures **(Physical Barriers)** are also recommended; refer to page 15 for more detail.

Your existing management efforts (trail and clean-up) in these areas are to be commended. Continued efforts, including noxious plant and noxious tree removal in this area are encouraged and will provide even more benefits as the impacted areas respond to the time, energy and inputs you are putting into it. The planting of once cleared areas in green manure crops, permanent, grass filtering surfaces and new tree seedlings is a valuable and important process of tying the existing native landscape to the homes while providing important resource benefits.

Existing trees should be monitored for dieback or a loss of vigor and removal should only be considered if a house is within reach of a wind thrown tree due to this. Several homeowners have tried with limited success to grow food crops on the steep slopes within the house envelope and have commented on the challenges of doing so due to the shading of the forest trees. It is our recommendation that the growing of food crops within this area be limited to those types of crops that are shade tolerant and can produce large quantities of harvest for the given space and water resources available.

Crops requiring more sun, water and larger growing areas should be planted in the community garden space provided to the east along Lovers Lane. This garden area should be increased in size to accommodate more Bonnie Brae households to grow food crops. That said there might be a potential growing site that could be developed to the east of housing units 68 and 76 and south of the pond. This would allow for the development of the water resource present in the pond and a bit more sunshine while taking advantage of the transition in soil types available.

Another issue discussed was the desire of some households to bring small ruminant livestock such as goats on site. While goats have a proven record in the control of noxious weeds and trees they can also damage desirable forest species in the process. The current challenge with water resources would indicate another limitation in regards to this scenario. The other variables that challenge this desire would be:

- 1) The need for a site that could hold goats during non-browsing activities, winter months requiring a heavy use area and a physical building being very important;
- 2) Control and composting of manure and the slopes involved next to or near the houses and seasonal water flow;
- 3) Owner responsibilities clashing with the interests of non-livestock owning neighbors.

These are of course challenges that would have to be met by the Bonnie Brae community members if they so chose to do so. The site previously mentioned for a garden site may offer options in this matter also. The requirements of moving small ruminant livestock on site would have to be balanced with the resource concerns and proper best management practices needed to accomplish the inclusion of livestock in the resource base you live amongst.

Area 3 and 4

Selective Harvest / Thinning

If you do a sustainable selective harvest process for your own personal use several criteria should be considered. They are: 1) for a stand with balanced tree sizes, species, and canopy structure, harvest trees to mirror the pre-harvest condition and 2) for a stand with little variation in tree sizes, species, or canopy structure, harvest trees to convert the stand to a condition of greater species, size, and canopy function diversity. This might entail special plantings to increase species diversity and begin changing canopy structure this way. Noxious tree species removal and thinning would be the reason for a selective harvest.

Salvage Harvest

Occasional wind throw or standing dead trees could be salvaged for firewood. On the other hand, they are valuable to stand habitat diversity and given the effort required to remove some of the more distant specimens, your decisions should be based upon a balance of both these needs. Unless Douglas fir in any quantity or other species in large quantity and fairly close proximity, become salvageable (i.e. die or are wind thrown), salvage should be based upon true need or left alone if in doubt. Salvage priority is similar to selective harvest based upon the biological needs of the stand in maintaining viable habitat and stand diversity, balanced against the potential for personal use (or monetary gain), or fire danger since downed trees are a functional element in a healthy stand.

When you decide to harvest trees the trees should be in the following order: good quality blown down trees, leaning trees, damaged trees, trees in poor health (scarred, dead tops, diseased, sick, poor crowns, etc.). **Mark harvest trees carefully prior to removal.** Conifer species should be selected to develop or maintain a more species diverse forest. For their protection, seed trees and wildlife trees should be identified prior to logging. Retain wildlife snags that pose no danger (For specific information on Snags, refer to page 12). The existing **access trail** throughout the property **should be widened and new trails developed to reach the northern portions of Area 3. An area of at least ten feet total should be maintained for a firebreak.** This should only be done in the dry months. Utilize the existing utility trail as much as possible. Removing all brush within the main trail for at least four feet and then reducing the outer three feet on either side of the main cleared trail will make access to desirable cleared areas easier for harvest/thinning and re-planting while increasing the fire protection ability of the trails.

The best time to plant a tree is immediately after removing a tree or creating a clearing through brush removal because you already have access to the site. If you plan to plant a tree immediately, it is recommended that if a soil analysis proves additional plant nutrients are necessary, a fertilization treatment be applied following re-planting.

To maintain and enhance the current stand it is recommended that you plant native trees suited to the particular site: Douglas fir, Cedar. Feel free to also plant other desirable deciduous species and see how they do.

Douglas fir requires nearly full sun; Red cedar less but both will grow well in open areas. Natural regeneration is occurring but on a limited basis and should be augmented with planting desirable species for increased diversity. For shade areas plant species such as western red cedar, western hemlock, and grand fir. Space the trees according to how you desire them to appear when they are mature, however, leave at least 15' between each tree to alleviate resource competition. Thinning of existing Red alder and Douglas fir will be an important first step. Refer to the notes below regarding planting alternatives, site clearing and re-planting considerations.

To facilitate seedling establishment, it is recommended that around small seedlings, competing vegetation be controlled manually to prevent over-topping. Seedlings should also be monitored and protected from animal damage. Tree guards of tubular HDPE are a good investment for this protection. See the resource list in section five of this plan.

Woody debris should be left scattered across forest floor to decompose and re-cycle nutrients, except to establish 3 to 4 small brushy piles per acre for wildlife. For more information on brush piles for wildlife, refer to the Wildlife Habitat Section.

Trails should be grass seeded to prevent erosion, provide wildlife habitat, and create a recreational atmosphere. Plan the widening of trails to minimize soil disturbance and maximize recreational opportunities. Trail maintenance (i.e. mowing grass) will assist in fire control measures and enhance wildlife and recreational opportunities.

There should be some regeneration if areas have not been thoroughly cleared. Plant only areas that are not undergoing regeneration on their own and were you desire to provide more open space within the forest area.

Wind

Some wind thrown wood should be left to provide habitat for wildlife and nutrients to the soil as it decomposes. A good rule of thumb is to remove no more than twenty percent of the trees (spaced according to your desires) during any one-entry harvest period.

Insects, Disease, and Animal Damage

When necessary, thinning will reduce competition for moisture and nutrients and allow remaining trees to become healthier and grow faster. The remaining forest will become more resistant to attack from insects or disease.

Recommended Management Time Table

2011/2013

- Plant sparsely treed areas in areas 3 and 4 with native species trees (Douglas fir, Cedar) to increase species diversity and to reforest desirable areas. Use raised micro-topographic sites such as next to stumps as planting sites; protect the seedlings with deer barriers. Initial clearing of current vegetation will be required.
- Remove noxious weeds and noxious invading trees.
- Care for seedlings until the majority of the live-needed tops are above deer browsing heights of five feet.
- Control of competing vegetation around small seedlings by removing or cutting Salal, Oregon grape or grasses.
- Harvest / thin trees for salvage and use for firewood if not sold. (Firewood sales would be a good way to pay for the trail widening, tree sapling removal/clearing and re-planting costs in Areas 3 and 4.)
- Rejuvenate around the building sites with native plant species that are fire resistant, desirable, zone hardy and extend bare ground were fire protection is desired.

2011-14

- Development/maintenance and widening of trails
- Thin dense patches of saplings that are 15-18 years old if desired for timber management.
- Create cleared areas within the forest for re-planting.
- Grass seeding management trails following salvage harvest as needed.
- Continue control of competing vegetation around small seedlings

2015-20+

- Continue with management as needed following guidelines above.

The following section provides a detailed description of the forest management recommendations that were put forth in the previous section as the preferred alternative to current management.

Selective Harvest

Selective harvest is cutting a percentage of available harvestable trees in a stand by varying tree sizes, species, and canopy layer locations to attain a stand structure that mirrors the pre-harvest conditions or which seeks to create the conditions of mature forest (e.g. multiple tree sizes, canopy structure, and species diversity). A good rule of thumb is to remove no more than 20 percent of the trees (spaced according to your desires) during any one-entry period.

Within both units you indicated a desire to protect and enhance the overall health, wildlife value, and aesthetics of the forest. Selective thinning is one option to relieve trees of the competitive pressure experienced under crowded conditions. This “release” from competition should allow the remaining trees to grow larger and healthier and allow new seedlings to become established. However it could make the stand more

susceptible to blow down and some regeneration will occur naturally as crowded trees die out.

For every anticipated harvest, only go into the forest when the soils are dry. Thinning in western Washington should be accomplished during tree dormancy (July through March) when bark is tight on residual trees making them less susceptible to damage. Tree removal is best accomplished manually with either a chainsaw or a handsaw by cutting below the lowest living limb, but no higher than one foot off the ground. Encircling the tree with a continuous cut that completely severs the bark may girdle trees and cambium layers and extends into the outer sapwood. Girdling will allow the dead trees to break down slowly, avoiding the large fuel buildup that cutting trees down creates and can also create desirable wildlife snags.

Trail Considerations

You will be widening and creating trails in both forest areas 3 and 4. The existing trail can be converted into the envisioned trail system with proper planning and equipment. Because of the potential for soil compaction from use of heavy equipment, equipment should not be used during wet soil conditions. Lightweight equipment or even horse logging should be considered for skidding harvested trees. If the need arises, all access and trails should be established in a manner that the area of damage is kept to a minimum.

It is extremely important that harvesting activities do not damage either the soil or the trees that will be left behind. Harvesting operations should take the following considerations into account:

1. To avoid unnecessary soil compaction, new trails should be kept to a minimum. Low ground pressure equipment with wide tracks are better than rubber tired equipment. Horses are even better. Cable warding systems have the least impact on the soil because they can suspend at least one end of the log during skidding.
2. Horses, skidders or tractors with cables may be utilized in portions of the property and should be favored over those with grapples because soil compaction can be confined to the skid trails (i.e. the skidder remains on the trail rather than backing up to each log). Track machines should be used over wheel machines. Walking on the slash will reduce soil compaction. Skidding equipment such as four wheel ATV's with cables that can be pulled out to each log, and then retracted to bring the log into a skid trail, is recommended. If you want a real workout consider a physical fitness program for all the able bodied residents for this activity! Have a harvest event and food potluck!

(Re) Planting Alternatives*

1. **Leave site as is to re-establish naturally.** This process is slow and currently leading to a different forest composition than originally existed on site, with less

diversity. However, this alternative would require the least amount of effort, time and money but only if initial action is taken to remove noxious weeds and trees!

2. ***Allow the site to regrow with the original mix of species by the percentages that existed on site after thinning.*** This alternative may create the most aesthetically pleasing site in the least amount of time. If planting is skipped but thinning occurs over time, an even age stand of nicely spaced trees would likely become established. If planting were added but spaced out over years, then a mix of tree ages and sizes would be more likely. This alternative would also be the most intensive in terms of time and resources. Sources of trees should be checked for seed and zone similarities or the gathering of seeds from your trees can be a useful (but time consuming) method of starting young trees for re-planting.
3. ***Plant only the easily accessible spots with species that originally existed on site.*** This alternative limits effort spent to those areas that are easy to replant. You have few of these desirable areas available at this time. It would allow some areas to regenerate naturally and others to be planted which should help to create a mix of tree sizes and ages. It would also help increase the wildlife habitat on site and improve the aesthetic quality of the area, especially if plantings were focused around the planned and existing trail through the site and or newly created cleared areas within it. Noxious weed and tree control would be necessary.
4. ***Plant other species (native or not, but zone appropriate) that are currently not found on site.*** This would be the most risky scenario, because there may be reasons why these species were not originally found on the site. However, they may add to the aesthetics of the site and provide wildlife habitat.

*The best habitat for native wildlife is one with native plants that have evolved and occur naturally in an area. These plants are more closely matched to local soil and weather conditions, and wildlife has evolved to live with them. They will be better than non-native plants at providing the right kinds of food, shelter and diversity needed by wildlife. Native plants often need less care and maintenance than non-native plants.

Replanting Methods

1. ***Manual Site Clearing.*** Two methods of manually clearing a site are possible.
 - 1) A chainsaw (or brush cutter with tri-blade) can be used to cut vegetation from the planting site, or 2) the area immediately around the proposed seedling location can be cleared with a planting hoe or shovel. An area that is a minimum of 3 feet by 3 feet should be cleared of competing vegetation. Work can be done using hand tools or combined with a chipper-shredder for a good source of mulch.
2. ***Chemical Site Clearing.*** Competing vegetation can be killed with herbicides in order to clear a spot for replanting. This alternative is not recommended for

these areas due to the proximity of the property to houses, a filtering wetland, seasonal water flow and the East Sound Watershed drainage system. If you do consider this form of clearing please contact the SJC Noxious Weed Coordinators office for information from them as they are state certified for herbicide application information.

Operate equipment only when soil is relatively dry or frozen. Restrict equipment to designated skid trails as much as possible. Grass seed management on the trails following disturbance will be important.

Replanting Considerations

Tree species have varying growth times and shade tolerance. For example, lodgepole, alder and Douglas fir are intolerant of shade, however alder seedlings have faster juvenile height growth than Douglas fir or lodgepole so they will quickly overtop them and cast a life-threatening canopy of shade over them. Eventually the majority of the conifer seedlings will die out of the stand, and a stand of alder will occupy the area for the foreseeable future. Likewise, existing exotic trees (Holly) with vigorous growth habits can overtop and crowd out young stands of Douglas-fir seedlings.

The desired end result will dictate the amount and spacing of replanting. If trees are planted close together, then the live crowns will close sooner, shading out under story plants and seedlings. If the trees are planted lightly, then some natural regeneration will occur in between. This will create a more “natural” appearance on site.

Douglas fir, for example, requires nearly full sunlight during juvenile growth periods to survive and thrive. In order to ensure survival, openings must be created to allow sunlight to reach juvenile plants. This is especially true in the areas where Salal is abundant. These plants must be cleared enough to allow light in and release the seedlings to grow with less competition. Once the Douglas fir has become well established, you could then allow native under story vegetation such as Salal, Oregon grape, and ocean spray to once again flourish.

Grand fir, unlike Douglas fir, will regenerate in light shade. Grand fir can tolerate wetter soils than Douglas fir. It grows best on deep, moist, well-drained soils such as found in the areas that retain water in the winter months. Some experimentation with this species would be necessary before major numbers were planted. You want to see if it can thrive in the somewhat slow draining soils in areas 3 and 4.

Physical Barriers

In order to ensure seedling survival, physical barriers can be used to protect trees from grazing and gnawing animals. Tubes, nets, bud caps, and sleeves can all be applied directly to seedlings to limit damage, but should be monitored for two or three years following planting to ensure that they are working. You may have to readjust the barriers every year. After the third year, you may need to cut back brush so that the

trees are not shaded and or protective barriers may need to be removed or reinstalled new.

Wildlife Habitat

The intermixed areas of all areas and on adjacent properties provide seasonal and year round habitats for a variety of animals. The typical wildlife species occurring on the property would be those associated with forested habitats such as songbirds (wrens, chickadees, sparrows, etc.), woodpeckers (pileated, hairy, downy, sapsuckers), quail, hawks, deer, and other species present. The single greatest benefit to wildlife will be the retention of the property as forestland. Areas 3 and 4, in addition to supplying needed timber, can also be managed for wildlife habitat, (providing snags, cover, water, food, downed logs, and green trees). The recommended snag requirement of 3 snags per acre can be created over time by selectively leaving “dead” trees standing. To provide additional cavity nesting habitat, a variety of bird nest boxes could be installed throughout the property.

All wildlife requires food, water, space, and cover (for hiding and for shelter from the elements). A key to determining how to support the greatest number of species as well as the highest number of individual animals on the property is to create the maximum amount of “habitat diversity”. Managing the property to achieve a variety of plant species, a mix of tree age classes, and a variety of structural features provides habitat diversity. In maximizing the variety that the property provides, the potential to support wildlife will be maximized.

Snags

Standing dead or dying trees, or snags, provide places to feed, hide, build nests or dens, and rest to many species of birds and mammals. The requirement of long range planning is to maintain at least 3 snags and 3 green recruitment trees per acre. Additional snags (both large and small) should be retained where possible. The property, like most private forestlands, does not have snags of the size and density described above. Some ways of regaining a snag component within the forest over time are:

1. Leave selected standing dead or dying trees where safely possible. Allowing trees that are dying through natural phenomena to remain standing helps to assure that the forest has a healthy snag component. On average, depending on tree species and other conditions, it may take 5 years or more from time of death for a snag to decay sufficiently for primary cavity nesting habitat to be provided. However, a large diameter snag may be used by wildlife for well over 50 years, depending on its species and the kinds of decay and other factors to which it is subjected.
2. Identify and mark live trees that can be left to become snags in the future (green recruitment trees). These can be trees that are defective in some way, such as having crooked bole, heavy limbs, decay, or damaged tops. Snags and green recruitment trees will be most useful to wildlife if they are generally grouped together in clumps, rather than evenly distributed throughout the forest.

3. Tall stumps will also be used by some species. Do not remove any existing tall stumps.
4. Placing nest boxes, for specific species, in appropriate locations can enhance cavity availability. Generally, no more than one nest box per one-quarter acre should be installed.

Downed Wood

Wood left on the forest floor is beneficial in many ways. Small diameter materials will decay quickly, contributing nutrients to the forest system. Large diameter logs decompose more slowly and are used as perches, look-outs, foraging sites, hiding places, den and nesting sites, and other functions by many species including some amphibians and reptiles.

A diverse western Washington forest should have at least 2 downed logs per acre, at least 12" diameter at small end and a minimum of 20' length, or equivalent volume. Smaller diameter trees left on the forest floor will also contribute to the structure of the forest.

1. Place downed trees and slash on the ground where possible
2. Leave all existing defective large diameter logs
3. In thinned stands, leave some larger material on the ground. Leave branches and other small diameter materials on the ground to decompose and enhance the soil nutrients. If heavy amounts of slash remain, lop and gather or scatter into piles.

Brush Piles

Create small brush piles using branches from wind throw, slash, and pruning. Such brush piles can form important nesting and hiding habitat for birds.

In order to provide wildlife habitat in the form of woody debris, it is recommended that the brush that results from the selective thinning be gathered into piles and left throughout the site. This spreading will provide habitat for wildlife. To minimize the fire hazard associated with the piles, each pile should not be greater than 6' in diameter and 4'tall.

Openings

Small openings within the forest enhance most wildlife. As young plantings mature and the amount of brush become reduced, consider creating openings by removing conifer trees and allowing native shrubs to reestablish. Shrubs will provide important browse for deer. Deer and other mammals will probably use a salt block placed in a clearing. This is suggested as one possible way to shift use by deer away from areas planted with seedlings.

Food Plants

A variety of fruit or berry producing plants are used by wildlife. Berry producing plants can be planted at the edges where the forest meets openings or along the edge of a wetland or stream, (for example: woods rose, snowberry, blue elderberry, cascara,

pacific dogwood, red osier dogwood, honeysuckle, mock orange, mountain ash, huckleberry, Madrone, serviceberry, black Hawthorne, western crabapple, Oregon grape, Salal, or red flowering currant). Publications are available suggesting a more complete plant species list and where to plant them. Planting native shrubs in irregular patterns so that the straight-line edge of forest and adjacent lands is reduced can enhance the configuration of edge habitat.

Seeding the access trails (and clearings) will enhance food availability for a variety of wildlife. The following prescriptions will work well in this county; these are based on applications of 20 lbs. / acre, and should be adjusted according to the amount of ground to be seeded. Seeding should be done immediately after soil disturbance, in spring or early fall, well before frost.

For shade areas:

- 40% creeping fescue
- 20% orchard grass
- 20% white Dutch clover
- 10% Birdsfoot or big trefoil
- 10% annual rye

For sun areas:

- 20% perennial ryegrass
- 20% white Dutch clover
- 20% tall fescue
- 15% orchard grass
- 15% Birdsfoot trefoil
- 10% annual rye

*Note, clovers and legumes should be inoculated with Dormal or another appropriate inoculates just prior to seeding.

SUGGESTED PRACTICES-SINGLE ALTERNATIVE

The following is a list of Natural Resources Conservation Service forest conservation practices that you could choose for implementation.

- Ground Preparation (490 Forest Site Preparation)
- Herbaceous Weed Control (315)
- Replanting/Plant Protection (612 Tree/Shrub Establishment)
- Thinning (666 Forest Stand Improvement)
- Forest Slash Treatment (384)
- Wildlife Upland Habitat Management (645)
- Forest Harvest Trails and Landings (655)

Forest Site Preparation (490)-Ground Preparation

DEFINITION

Treating areas to improve site conditions for
Re-establishing a diverse, complex forest.

PURPOSE

This practice may be applied as part of a
resource management system to support one or
more of the following:

- _ Encourage natural regeneration of desirable woody plants.
- _ Permit artificial establishment of woody plants.

Herbaceous Weed Control- (315)

DEFINITION

The removal or control of herbaceous weeds including invasive, noxious and prohibited plants and trees.

PURPOSE

- Enhance accessibility, quantity, and quality of forest resources and habitat.
- Restore or release native or create desired plant communities and wildlife habitats consistent with the ecological site.
- Protect soils and control erosion
- Reduce fine-fuels fire hazard and improve air quality

Replanting & Plant Protection- (612 Tree/Shrub Establishment)-

DEFINITION

Establishing (and protection of seedling woody plants) by planting seedlings or cuttings, direct seeding, or natural regeneration.

PURPOSE

Establish woody plants for:

- forest products such as timber, pulpwood, and energy biomass
- wildlife habitat
- long-term erosion control and improvement of water quality
- treating waste
- storing carbon in biomass
- energy conservation

- improving or restoring natural diversity
- enhancing aesthetics.

Thinning (666 Forest Stand Improvement)-

Definition

The manipulation of species composition, stand structure, and stocking by cutting, killing of selected trees and under story vegetation.

Purposes

Forest Stand Improvement;

- ❑ To increase the quality and quantity of forest products, e.g. saw timber, veneer, wood fiber, poles, pilings, maple syrup, naval stores, nuts and fruits
- ❑ To harvest forest products
- ❑ To initiate forest stand regeneration;
- ❑ To reduce the potential of damage from wildfire, pests, and moisture stress;
- ❑ To restore natural plant communities;
- ❑ To achieve a desired under story plant community;
- ❑ To improve aesthetic, recreation, and open space values;
- ❑ To improve wildlife habitat;
- ❑ To improve water conservation and yield;
- ❑ To achieve a desired level of crop tree stocking and density;
- ❑ To increase carbon storage in selected crop trees.

Forest Slash Treatment (384)-

Forest Slash Treatment

Treating woody plant residues created during forestry, agro forestry and horticultural activities to achieve management objectives.

Purposes

- Reduce hazardous fuels
- Reduce the risk of harmful insects and disease
- Protect/maintain air quality by reducing the risk of wildfire
- Improve access to forage for grazing and browsing animals
- Enhance aesthetics
- Reduce the risk of harm to humans and livestock
- Improve the soil organic matter and maintain or improve soil health and soil quality
- Improve the site for natural or artificial regeneration.

645 Wildlife Upland Habitat Management-

DEFINITION

Creating, restoring, maintaining or enhancing areas for food, cover, and water for upland wildlife and species that use upland habitat for a portion of their life cycle.

PURPOSES

This practice may be applied as part of a resource management system to:

- _ Provide a variety of food for wildlife;
- _ Provide a variety of cover types for wildlife; examples of wildlife use include nesting in dense shrubs, fawning in tall grass, resting in snags, escape from predation along travel lanes, and thermal buffering created by conifer stands.
- _ Provide water for wildlife.
- _ Arrange habitat elements in proper amounts and locations to benefit wildlife.

655 Forest Harvest Trails and Landings-

DEFINITION

A temporary or infrequently used route, path or cleared area within a forest.

PURPOSE

- Provide infrequent access to forest stands for management activities including fire suppression.
- Provide periodic access for removal and collection of forest products.

Once you have had a chance to make decisions, you can review them in the record of decisions, which gives a proposed time line to give you a starting point; see the attached Draft Record of Decisions page. This record of decisions represents the practices you may decide to complete in your conservation plan and will become the plan once you have made your decisions and begin work. Please take some time to review the plan. If necessary then we can discuss any questions or concerns you may have.

CONCLUSION

The implementation of this plan should result in an aesthetically pleasing site that will support abundant wildlife, and the Bonnie Brae –Reddick forest needs, and limited wood use for generations. This plan is a dynamic, working document developed to assist you in the reforestation and productivity of your forest property. This plan can and should be updated as necessary to reflect changes in objectives, goals and management objectives.

REFERENCES

Soil Survey, San Juan County, Washington, USDA/NRCS Web Soil Survey, Tabular data, and ver. 6, 2009.

Electronic Field Office Technical Guide, Section IV, Practices and Standards, Natural Resources Conservation Service.

Electronic Field Office Technical Guide, Section III, Resource Quality Criteria for RMS, Natural Resources Conservation Service.