IRM INVENTORY REPORT

GROUP 3

FRST 242

MARCH 14TH 2014

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Introduction

The following Inventory assessment describes physical and biological characteristics of an 84 ha management area within the Vancouver Island University woodlot. The area is located approximately 10km northwest of downtown Nanaimo, to the south of Jameson road (see map 2).

The assessment was completed to confirm accuracy and to update existing mapping of the area. Values measured and assessed include timber type, volume, wildlife, soil, stream, road, cultural, visual, recreational, and forest health. The information gathered will help with responsible management of the university woodlot. Recommendations for preserving mentioned values, as well as effective harvesting methods are included.

1. Timber

1.1 Field Procedures

After being assigned an area, anchor points were identified and chosen as potential boundary limits. The road heading west from the gate on Jameson was chosen as the preliminary northern boundary for the block (see map 5). On Monday February 3, 2014 an initial recce was undertaken to get a feel for the lay of land and to identify areas of concern. With a better understanding of our assigned area, using woodlot data that already existed, a block boundary was mapped using ArcGIS (see map 5) and field procedures were determined (see appendix 5._).

As a group, it was decided that two main transects would bisect the block from corner to corner; with the idea that at least one plot would be completed in every labeled forest polygon within the block. The two transect lines were added to our map using ArcGIS (see map 5) and uploaded to iPhones. In the field, the phones were used to gather spatial data for each plot and for any other pertinent information. As well, field cards were completed to ensure all the same information was being collected at each plot. The location of plot center was chosen at random once field teams were sure that the respective area they were in was representative of the predetermined polygon label on the map. All points of interest were added to the map using the iPhones in the field and information pertaining to the seven overarching values – streams/wetlands, sensitive soils, wildlife habitat, recreation/visual, First Nations, forest health, biodiversity/forest structure – associated with this project, were adhered to as the

prime directives for obtaining field data. Field work was undertaken on February 16 and March 9, 2014 (see table 1 for equipment used).

Table 1

Field Equipment	
iPhone (x3)	Red book (x2)
Planting Shovels (x3)	Laser Range Finders (x2)
BAF 10 Prisms (x2)	Compass (x5)
DBH tapes (x3)	Suunto (x3)

1.2 Data Collected in each Plot

1. **Percent Cover** of Timber, shrubs, ferns and mosses was taken at each plot. Given the time of year and the struggles with bad weather (snow), a comprehensive list of the total species present at each site was impossible. The data obtained, however, was useful in comparing results from the field to what existed in the GIS database already.
2. To check **timber volumes**, field crews alternated between full measure plots and count plots. A BAF 10 prism was used to ascertain whether or not trees were in or out using the Variable Plot Sampling Method. For borderline trees, crews alternated between counting them and discounting them to expedite the data collection process. A DBH tape was used to measure diameters and a laser range finder was used to determine tree heights. The information gathered regarding the volume of each polygon was used as more of a means to verify the current volume tables that exist in the GIS data for the woodlot than as means to cruise potential cutblocks. Volumes were calculated for the completed measure plots (see table 5) and information gathered in count plots was compared to existing volume data from the GIS database for the VIU woodlot (see table 6). Confirmation of species present, age and growth was documented in plots that fell into regeneration polygons (see appendix 5).
3. **Soil texture, CFC content, forest floor type and thickness and Site Series** were determined in each plot. The data collected was used to establish areas that could have potential site limiting factors for harvest operations, road building or reforestation.
4. **Forest health** issues were documented whenever encountered and any pertinent information with regards to the seven main directives was documented in the comment section for each plot respectively.

The completed field work acted as a gauge for what information already currently existed for the projected area to be managed. In general, the data collected reaffirmed what was already known. There was very little, if any, discrepancy between information gathered in the field and the information present in the GIS database.

1.3 Harvest Planning and Roads

The following describes the equipment and resources that will be used to fell, move timber to roadside and haul timber from the area defined in the Group 3 THLB map (see map 2). The non-harvestable areas are also described along with factor used for classification. The classification scheme and is also described along with definitions for each road classes 1-3.

1.4 Description of Typical Equipment

All of the timber within the Group 3 mapped area will be manually felled. The cutblock sizes will be small (some <5ha), and along with Wildlife Tree patches, experienced manually felling is required. The use of a feller-buncher could result in damaging adjacent stands and leave trees. Shallow soils in some areas will also require minimal disturbance from machinery. Fallers will limb and buck trees after felling.

After the timber has been felled, hoe forwarding will be used to move timber to roadside. The use of a cable-logging system is not justified due to small cutblock size and the majority of the area being <35% slope. Hoe forwarding is the most economic system for the timber types in the area and will not cause as much soil disturbance as skidding. The potential harvesting area defined on the THLB map has been designed to accommodate the operating capabilities of the machine. Slopes over 40% were classified as non-harvestable, and maximum forwarding distance is <250m. A Tiger Cat T-250C will be used to forward logs to roadside.

Self-loading highway logging trucks will be used to deliver the timber from roadside to the Cedar log sort. These self-loading trucks will maximize the time the forwarder is moving logs to roadside by eliminating the need for a forwarder to load the truck. The trucks are also able to unload themselves which will decrease the overall turn time.

1.5 Non-Harvestable Areas

There are several areas within the Group 3 boundary that are classified as 'non-harvestable'. These areas include rock outcrops, gullies / riparian buffer, wetlands, slope

stability issues and regenerating stands <30yrs and are identified on the IRM THLB Map (map 2). The following criteria was used to classify the non-harvestable areas:

- Rock Outcrop: overall soil depth <50cm, visible rock protruding from soil, arbutus and un-healthy pine, typical very dry site species (shrubs). Area must be larger than 0.25 ha to be classified. Three large rock outcrops were classified and are displayed on the map.
- Gully / Riparian Reserve: steep stream banks >50% and >5m tall, longer than 100m reach, visible slope stability issues, abundance of CWD in stream. Stream that flows into another fish bearing stream, or is up-stream from a fish barrier. One area in the North-East corner of the management zone was found to be severely gullied and within 250m of a fish break.
- Slope Stability Issues: the initial field recce revealed an area in the South-East corner in the management zone was found to have steep slopes with fine textured soil and evidence of past failures. This area is displayed on the IRM THLB Map (see map 2).
- Regen <30yrs: after viewing the initial forest cover map, three previously harvested cutblocks were visited and determined too young to consider harvestable. These cutblocks were evaluated and classified as Free-Growing, therefore the harvesting of adjacent areas can commence.

1.6 Roads

Criteria for classification

1. Overgrown Roads (Roads that require considerable work to upgrade to class 5)
2. Pickup Access Roads (Roads that are drivable by picking up truck but will need work to bring them to a class 5 standard)
3. Standard Class 5 haul roads (no upgrades currently needed)

Our management area contains a network of trails and roads. Most of the roads are used by mountain bikers, motor vehicles, quads and hiking on a daily basis providing a form of public recreation (See map 4). The main road that leads to our management area, Jameson road, is classified as road class 3 because the road is not overgrown; no upgrade is currently need and serves as a haul road. The road will provide logging truck access when our block is harvested. From the main gate, the road runs 650 meters from the gate to the end of our management area where it ends.

To know where the roads and trails end, we tracked all with GPS application connected to pdf maps on our iPhones to confirm their location, condition and state. These were uploaded into ArcGIS and identified on our map (see map 2).

Observations: There was one section of our pick up access road (Road class 2) that has waterfalls running across, see figure 1. This section is identified on our map. Class 2 roads could be widened to allow access to logging trucks, if harvesting is to be done in the middle of our block.

Unclear Doesn't show waterfalls

Figure 1 2 needs a caption

Culverts and Ditches: The culverts on our management area seem to be in good condition allowing good flow of water in the fish bearing streams.

2. Silviculture

2.1 Ecosystems

Using the collected field data, ecosystems in the Group 3 area were mapped using site series and the Terrestrial Ecosystem Mapping (TEM) format. The field data was used along with Google Earth and contour data to distinguish boundaries between site series in the area. The resulting IRM TEM map attached displays the site series ecosystem existing in the area (see map 3). Areas were grouped into complexes and only one ecosystem classified was less than 2ha because it was a rock outcrop that extended beyond the IRM group boundary.

2.2 Site Series

The entire IRM management area fell within the CHWxm1 BEC variant (between 150m-700. Elev.), and was further classified into site series. The climate within the CWHxm1 variant consists of warm, dry summer and moist, mild winters. The growing seasons are

relatively long and the major tree species consist of Douglas-fir, Western hemlock and a minor component of Western red cedar. The field data collected determined there to be 6 different site series with the management are along with 4 complexes. The site series soil moisture regime ranged from very dry to very moist, and the soil nutrient regime ranged from very poor to rich. Table: 2 below describes each site series and complex found in the Group 3 area.

Table 2 ← Needs a description

Good table

Site Series	Slope Position	Soil Properties	Vegetation	Area (ha)
01	Middle / Bench	- Water receiving / shedding - Ah, developed B horizon - moderate depth (~1m)	- Fd, Hw, (Cw) - Salal, Oregon grape, Sword fern, Kindbergia	29.8
02	Ridge top / Rock Outcrop	- Water shedding (very dry) - Ae, undeveloped B horizon - shallow depth (<50cm)	- Fd, Pl, Arbutus - Salal, Oceanspray, Kindbergia	1.5
05/01	Middle / Lower	- Water receiving (+shedding) - Ah, well developed B horizon - moderate depth (>1m)	- Fd, Hw, (Cw, Dr) - Oregon grape, huckleberry, vanilla leaf, sword fern	9.4
01/04	Upper-Middle Lower-Middle	- Water receiving / shedding - Ah, developed B horizon - moderate depth (~1m)	- Fd, Hw, (Cw) - Salal, Oregon grape, oceanspray, sword fern, step moss	6.9
03/02	Upper / Crest	- Water shedding - Ae,	- Fd, Pl, Hw, Arbutus - Salal,	23.0

		undeveloped B horizon - shallow depth (<50cm)	oceanspray, kindbergia	
06/01	Middle / Lower	- Water receiving - Ah, well developed B horizon - deep soil (>1m)	- Hw, Fd, Cw - Salal, huckleberry, Oregon grape, sword fern, step moss	13.2

2.3 Soils Overview

Soils Inventory

Our management area was assessed based on: ?

Table 3 - Typical soil conditions

Parent Material	Basal-till
Soil Depth (A, B, & C)	>1.5m
B horizon	0.5m – >1.0m // Reddish brown colour
A horizon	>0.1m // Dark-brown colour
Humus Form	Moder (various groups)
LFH horizon	>0.05m // F dominated
Soil Texture	Sandy-loam
CFC	60-70%
CFC Shape	Sub-angular
Drainage	Well-drained
Tree Rooting	>0.4m deep
SMR // SNR	Moderately-dry soil (1) // Poor nutrients (B)
Vegetation cover	Salal dominated (20-100%), Dull oregan-grape 10%, Step moss 10%
Forest	Fdc, Cw mix

The soil types found in the management are (MA) did not have a great amount of variation. The soil order in every plot within the MA was determined to be Brunisolic. Brunisols are generally found in warm relatively dry low elevation environments or on southern aspects in high elevations. On zonal and richer sites, the soil horizons consisted of thick Ah horizon, followed by a Bm horizon which was significantly different in colour from the parent material. On the upper slope (site series 03) and ridge crest (02) sites, the horizons consisted of Ae/Ah horizon, followed by a Bm with less colour change than

the richer sites. The coarse fragment content (CFC) ranged from 20-85% depending on location. The drier upper slope site had a high CFC around 50-85%, while the middle and lower slopes had a lower CFC around 20-50%. The majority of the MA consisted of coarse textured soils with a moderate CFC resulting in moderate-well drained soils. Certain areas around the swamp have fine textured soils and low CFC resulting in poor drainage. The swamp defined on the map should have a 15m machine free buffer placed around it to protect the sensitive soils from compaction and degradation (see map 2).

The most common soil texture found within the MA was a sandy loam. Other textures found in order of most common include; loam, sandy clay loam, clay loam and loamy sand. The soil depths found from the digging soil pits ranged from >1.5m on lower slopes, to 20-50cm found on upper slopes/ridge crest. The most common forest floor type found was a Moder. A Moder consists of both fungal and fauna biotic components that break down the litter layer to produce humus. Some richer lower slope sites had a Moder/Mor complex. The forest floor thickness varied from 1-8cm depending on the richness of the site and abundance of fungi/fauna that break down the organic matter. The predominant parent material found on the woodlot is basal till, and results in highly compacted parent material with homogenous distribution of sub-angular coarse fragments. This material was deposited under glacial ice and the surficial features are along contours resulting in a smoothing out of the landscape.

2.4 Sensitive Ecosystems

Our management area contains sensitive ecosystems that require special management consideration. These areas are identified on our map as gully / riparian reserve, rock outcrop, and a wetland classified as a swamp (see map 2). These areas are particularly susceptible to damage from harvesting operations, and will be slow, possibly unable to recover from disturbance.

2.5 Current and potential forest health issues

It is important to understand that within every forest there are pathogens that reduce wood quality. During the field recce the crew watched and searched for any pest, pathogen, or abiotic factor that could cause damage. Given the area and the species that inhabit it, the crew was able to predict potential future damaging agents as well. The findings were recorded and suggestions were made:

2.5.1 Current:

Laminated root rot (*phellinus weirii):*

Laminated Root rot is the most prevalent forest health concern in the management zone. It is currently located throughout the block and primarily attacks Douglas-fir; however, some areas are worse than others (see map 1). Although complete eradication of the pathogen isn't feasible, there are strategies in which to manage the problem. For example, after harvesting it is always a good idea to plant mixed species. This will reduce spread and reduce future damage. In the areas of high damage, it may be necessary to stump the area post-harvest to reduce the amount of pathogen in the ground and reduce surface area. This can be assessed by running transects through the forest and doing an ocular estimate of the damage.

Armillaria root rot (*armillaria ostoyae):*

Armillaria root rot is the other Douglas-fir damaging root rot within the management zone. Although there is only a small patch, it is important to note. On the coast, armillaria only attacks the younger regeneration (approximately up to 15 years old.) This is why it is important to plant mixed species. The armillaria found on site was not very significant and will not affect the overall health or vigour of the future stand. This damage can be assessed during a free growing survey.

Windthrow:

Windthrow is very difficult to eliminate and all trees are susceptible. Areas of major concern, however, include cut block boundaries facing prevailing winds, areas with high disease/dead timber, areas with shallow soils, and areas with wet soils. Windthrow was seen throughout the entire area; however, it is concentrated in areas with high root rot. This leads us to believe that root rot and windthrow are connected and should be managed accordingly. In order to reduce the effects of windthrow one could top the trees that face prevailing winds and plant genetically improved wind firm stock. Also, designing large retention patches has proven to reduce windthrow amounts. This can be assessed by periodically driving through cutblocks post-harvest.

I don't know of any genetic improvement for windfirmness

Animal (browsing):

Wildlife damage is evident throughout the area. Browsing by certain species such as deer and elk can be very damaging to seedling growth. In the

regeneration areas throughout the management zone we have seen browsing occur because they like to eat the new shoots. Protective cones should be placed around all the seedlings at time of planting to reduce the impact. Genetically improved stock with high terpene levels are also available and should be used in the areas of high damage (see map 4). Species at risk include Douglas-fir, true-firs, and Western red cedar. The future damage can be assessed during the regeneration delay survey and by walking through the cut blocks post-harvest.

Douglas-fir bark beetle:

Douglas-fir bark beetle was noticed within the area but was not an issue. The pest was only found on the downed trees throughout the management zone and did not affect wood quality. In large numbers these beetles will attack healthy trees but this is common mostly in the interior of B.C. The damage was assessed by peeling the bark from windthrow Douglas-fir trees and can be assessed post-harvest in the future.

2.5.2 Potential:

Spruce budworm:

Although not evident at the moment, spruce budworm may severely impact future crop trees. The pest comes in cycles and is current at a manageable endemic level. The damage in the future can be assessed during the free growing survey. The larvae attack Douglas-fir and can kill the tree after several years of infestation. The larvae can be located near the top of younger crop trees and are easily identified by the four white spots on each segment.

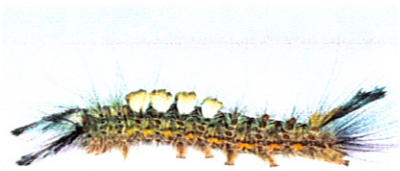
Hemlock Dwarf Mistletoe:

Because of their advanced seed dispersal system, hemlock dwarf mistletoe should be monitored in the future. This species attacks any age tree and can kill depending on the severity of infection. The "7-point

↗ Fig #, caption + source needed

Hawksworth" system should be used to assess damage and determine whether treatment is needed. This pathogen can be very damaging if the infection is high in the canopy, in a spaced area, and/or on a steep hillside. To assess, look for branch swelling ("witches brooms") as well as trunk swelling (see photos.)

With the climate changing, it is important to look at what may eventually move into the area. For example, in recent years the Douglas-fir tussock moth has made its way to the south island. The tussock moth generally prefers hot and dry areas and with global temperatures rising we may see an increase of infestation. The moth is capable of killing all ages of Douglas-fir within a year. On the other extreme, if temperatures drop we may see an increase in black-headed budworm infestations. Currently the North island is in an epidemic infection stage because the species likes cool and moist climates; if temperatures change we may see the budworm move farther South and into the area. This budworm targets mostly older trees but has been found to attack regeneration (around 15 years old.) It can kill the tree after four years of infection and targets Western hemlock and true-firs primarily. Both of these pests can be noticed by ocular inspection; they turn tree tops a burnt red colour.



Douglas fir tussock moth larvae

Black-headed budworm larvae

3. Other Values

3.1 Streams, lakes, and wetlands

3.1.1 Streams

The streams situated in our area have been walked through and confirmed to be either "S5 or S6 class" **non-fish bearing** streams. All known streams within the area feed into McClure creek. Identified approximately 250 meters north east of Jameson road is a visible fish barrier on McClure, below this the stream is considered an S3 **fish bearing** stream and feeds into the Millstone River.

During the field assessment days the streams seemed to be running higher than usual; the water level seemed to be at the bank full width (or near too)

indicating a severe flood. On the first stream assessment day there had been strong precipitation for the previous 2-3 days, there was snow on the ground. The second stream assessment day there was very heavy rain on snow events present and water levels significantly rose. Although the water levels were high, all culverts in the area were functioning properly and do not need replacing.

There are a few non-classified drainages (NCDs) located on site; however, these do not pose an issue because they meander until non visible or were only present due to the large volume of water in the area.

Although the Millstone River does not supply drinking water to Nanaimo, it is a very delicate and important habitat for water, land, and air based species. In recent years, Coho stock rehabilitation in the Millstone River has been a major work in progress. It is very important to not introduce any pollutants (including siltation) into the river as this could damage the project (valued at over a million dollars to date). For this reason, a 10 meter reserve/machine free zone shall be placed on both sides of all the streams located within the harvesting area. By doing this it strengthens the bond between the local community as well as keeping some biodiversity in the area. The proposed reserve will ensure minimal pollutants and debris enter the waterway keeping the Coho habitat clean. The buffer will act as a filter for spilt chemicals and the machine free zone will reduce soil disturbance and site degradation leading to siltation.

belongs in mgt report

3.1.2 Lakes and wetlands

There are no lakes situated within the area; however, the team found a larger wetland/swamp patch in the upper section of the ~~zone~~ area (see map 4). This area shall be deemed a "machine free zone" and should be left as reserve for ecosystem protection. The wetland boundaries are subject to change in relation to precipitation and time of year.

3.2 Potential Red/Blue Listed Species

Our assessment area is home to a great many species of mammal, bird, reptile, insect and mollusk. Many of these creatures are endangered, blue or red listed species.

At risk species that potentially inhabit our block include:

Scientific name	English Name	BC Listing
Anaxyrus boreas	Western Toad	Blue
Cervus elaphus roosevelti	Roosevelt Elk	Blue

Corynorhinus townsendii	Townsend's Big-eared Bat	Blue
Deroceras heperium	Evening Fieldslug	Red
Monadenia fidelis	Pacific Sideband	Blue
Mustela erminea anguinae	Ermine, *anguinae* subspecies	Blue
Myotis keenii	Keen's Myotis	Blue
Pristiloma johnsoni	Broad whorl Tightcoil	Blue
Marmota vancouverenis	Vancouver Island Marmot	Red
Gulo Gulo vancouverensis	Wolverine (vancouver subspecies)	Red
Brachyramphus marmoratus	Marbled Murrelet	Blue
Accipiter gentilis laingi	Northern Goshawk	Red
Hemphillia dromedarius	Dromedary Jumping Slug	Red

We did not encounter any of the above species at risk while examining our management area. They may, however, be present or capable of re-establishing themselves if existing habitat is maintained or improved.

In order to enhance the ability of red and blue listed species (and other species) to survive on our management area we are reserving wildlife trees and biologically diverse/unique areas. Wildlife trees include those that provide valuable habitat identified by: active wildlife use, cavities, decay, forks, loose/cracked bark, scars, nests, woodpecker excavations and dens. Selected wildlife trees will be wind firm to ensure that they will provide habitat for years to come and will be free of disease that endangers adjacent trees.

The number of wildlife trees in each forest cover type were estimated by direct observation, and were weighted in correspondence with older stands and site indices. Older stands were determined to have greater wildlife tree potential.

3.3 Estimate of Wildlife Trees / Snag per hectare

Table 4 below displays the number of potential wildlife trees per hectare in each polygon:

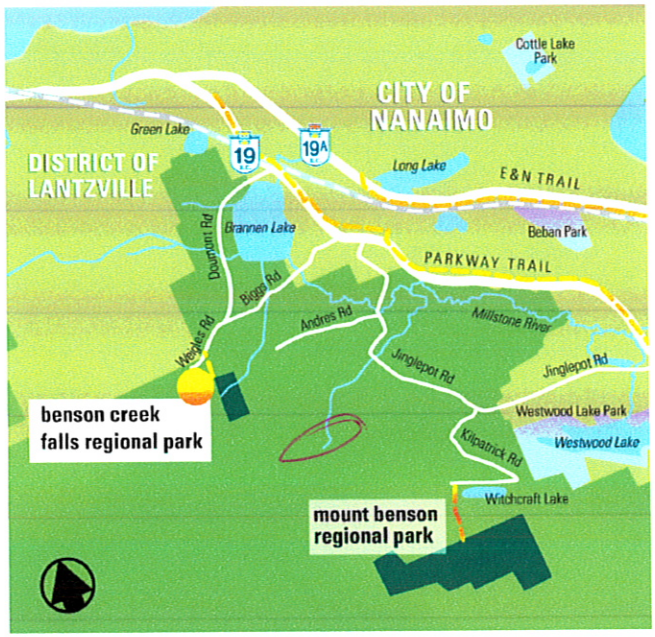
Table 4

Polygon #	Forest Cover Label	WT per ha
1005	FD 1941-25	62
1006	FD(PL) 1951-20	57
1007	FD(CW) 1921-22	72
1008	DR(FD) 1961-26	52
1009	PLFD 1962-19	47

1010	FD(CW)1951-22	58
1011	FD 1928-34	75
1012	FD(PL) 1951-22	58
1013	FD 1921-22	73
1014	NP	20
1015	FD(CW) 1925-30	74
1017	DRPW(CW)1992-23	24
1018	FD 1923-27	75
1019	FD 1923-32	77
1020	R	23
1021	FD(HW) 1924-31	78
1022	NP-FD 1921	33
1023	FD 1919-21	79
1024	FD 1921-13	73
1057	DRFD 1951-22	60
1062	FD(CW) 1921-35	81
1202	FD(CW) 1921-28	79

3.4 Recreational Trails and Other Features

There are two regional parks in relatively close proximity to our management area: Benson Creek Falls (Ammonite Falls) Regional Park and Mt. Benson Regional Park (see figure 2). Many people access Benson Creek Falls from the Jameson Gate and, therefore, walk the entire northern boundary of our block on route to the falls. Many people recreate on the VIU woodlot. During the three field days, group members encountered hikers, dog owners, ATV and dirt bike users, disc golf players, and mountain bikers. Other recreation users of note are: horseback riders and geocachers. The bottom line is that many Nanaimo residents recreate either on the VIU woodlot or in close proximity to the VIU woodlot on a regular basis. There are a number of different trails that already exist throughout the proposed management area, and they have been identified and mapped accordingly (see map 4). The Nanaimo Mountain Bike Club is certainly one of the major interest groups who utilize the land in and around the VIU woodlot (their presence is more notable on the private section of VIU's woodlot), and when developing a management plan for the block their interest will have to be considered.



← should show loc'n of mgt area

Figure 2

http://www.rdn.bc.ca/cms.asp?wpID=2621

3.5 Visual Quality Objectives

Harvesting on certain areas of the proposed block should consider Visual Quality Objectives. Utilizing the lay of the land to provide visual screens to particular places and areas of interest was determined by obtaining points that could be considered visual anchors when viewed from Harewood, Westwood Lake and Northfield Road rest area viewpoints (see map 4). The mandate to retain visual quality objectives is guided under the umbrella of the Vancouver Island Land Use Plan (VILUP). For the purpose of this exercise, the guidelines outlined in the Special Management Zone (SMZ) from Qualicum to Saanich will be abided by to ensure recreational and visual quality management objectives are addressed (see map 6). The guidelines listed in SMZ are as follows:

> "C. for the following Special Management Zones with primary visual resource values: 1, 2, 3, 5, 6, 7, 10, 11, 12, **13**, **14**, **18**, 19 and **22** (see map 6) maintain the visual quality of known scenic areas in accordance with the recommended visual quality classes in the visual landscape inventory, until the district manager establishes visual quality objectives for the areas."

The entirety of the proposed block falls under the retention parameters outlined in visual sensitivity classes 1 or 2, so harvesting operations must be managed accordingly,

as stated in section 59 of the Woodlot License Planning and Practices Regulations (WLPPR):

> "a woodlot licence holder must carry out primary forest activities in the area only in a manner that is consistent with the visual quality objective (...) (c) in visual sensitivity class 1 is in either the *preservation* or *retention* category, (d) in visual sensitivity class 2 is in either the *retention* or *partial retention* category."

Retention is defined by the BC government as: "*(b)* ***retention:*** *consisting of an altered forest landscape in which the alteration, when assessed from a significant public viewpoint, is (i) difficult to see, (ii) small in scale, and (iii) natural in appearance;"*

Furthermore, the visual sensitivity classes are outlined in greater detail in the visual landscape training manual:

> *Visual sensitivity class 1* – "Very high sensitivity to human-made visual alteration. The area is extremely important to viewers. There is a very high probability that the public would be concerned if the Visual Sensitivity Unit was visually altered in any way or to any scale."
>
> **Visual sensitivity class 2 –** "High sensitivity to human-made visual alteration. The area is very important to viewers. There is a high probability that the public would be concerned if the Visual Sensitivity Unit was visually altered."

After the completion of our field work, Visual Sensitivity Points (VSPs) have been identified (see map 4). Given the rigorous sensitivities to visual alterations, harvesting will have to be limited or not undertaken within these units.

2 – what makes these specific pts important?

3.6 First Nation Values

Cultural heritage resources on our management area should be considered. First Nations will be consulted to ensure an ongoing working relationship. The main cultural heritage values identified on our management area are mainly cedar trees. There are no spiritual sites or monumental cedar trees identified. In our management area, we observed salal and berry picking. These areas are mapped (see map 4).

used for ...

ok ... explained in opening paragraph

3 References

1. Green R.N., Klinka N. (1994). *A Field Guide to Site Identification and Interpretation for the Vancouver Forest Region*, Ministry of Forests Research Program.

2. Corrin D. (2013). *Tree Doctor*, retrieved from: www.isweb.viu.ca/test/td/main.asp

3. Woodlot License Planning and Practices Regulations, retrieved from: //www.bclaws.ca/Recon/document/ID/freeside/21_2004#section59.1

4. South Island Forest District, Objectives for Visual Quality, Retrieved from: (http://www.for.gov.bc.ca/dsi/Stewardship/Objectives_for_Visual_Quality.htm)

4 Appendices

5.1 Tables 5 & 6

Table 5

Measure Plot Volumes						
Plot #	Polygon #	Tree #	Species	DBH (cm)	Ht (m)	Volume (m^3/ha)
1	1019	1	Fd	58	43	
		2	Cw	31.4	31	
		3	Fd	49.5	32	
		4	Fd	54.3	36	
		5	Cw	31.4	21	
		6	Fd	96	46	**696.67**
5	1021	1	Cw	30.2	28	
		2	Fd	28.7	29	
		3	Fd	26.1	24	
		4	Fd	34.6	29	
		5	Fd	24.2	26	
		6	Fd	9.8	16	
		7	Fd	38.1	29.5	
		8	Cw	44.7	28	**698.33**
7	233	1	Fd	69.2	44	
		2	Fd	78.4	51	
		3	Fd	88.7	47	
		4	Fd	49.1	39	
		5	Fd	52.4	42	**743.33**
2	1003	1	Fd	56	35.1	
		2	Fd	25.9	25	

Should footnote your method of Vol. calc

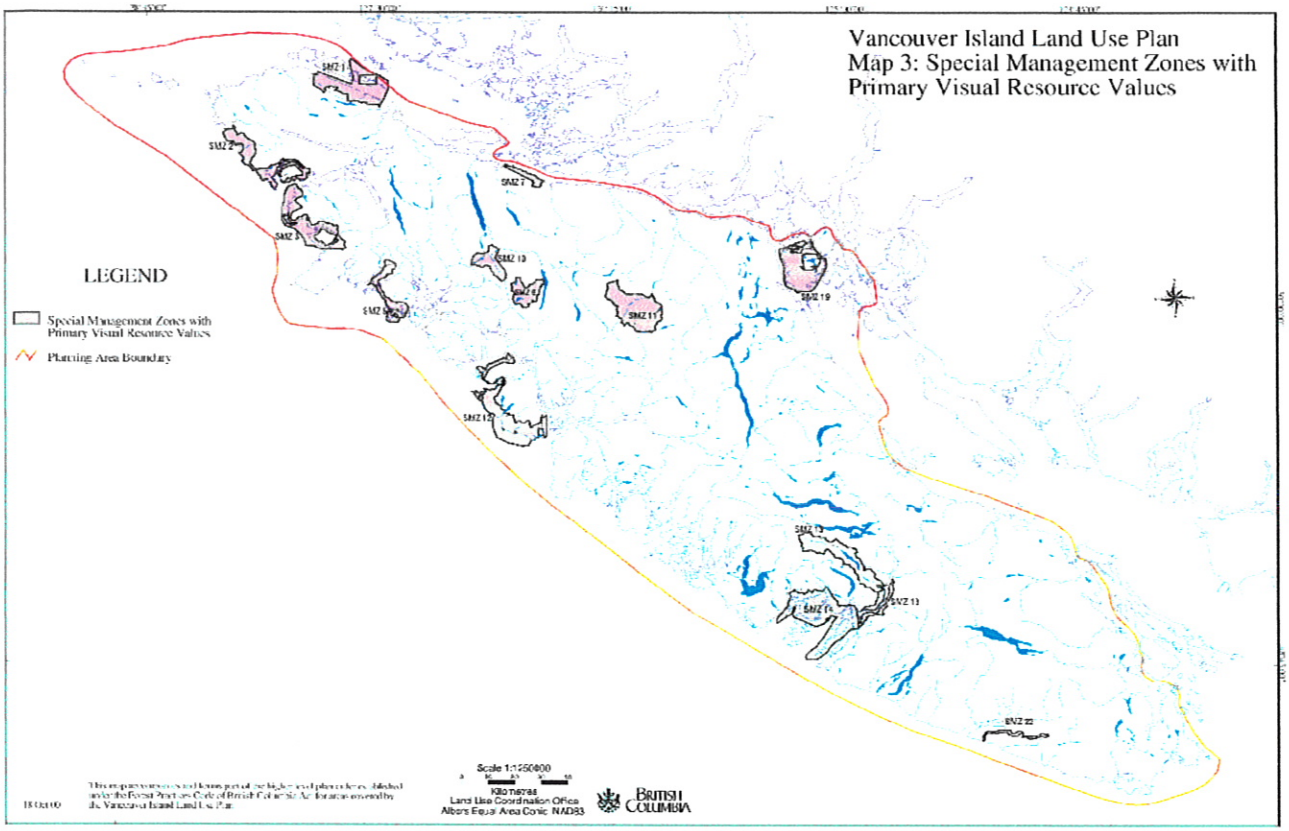
		3	Fd	32.6	34	
		4	Fd	28.3	31	
		5	Fd	41.9	36	
		6	Cw	51.3	31	**640.33**
4	1007	1	Fd	40	35.6	
		2	Fd	18	19	
		3	Fd	28.5	33	
		4	Fd	19	21	
		5	Fd	47	36.2	
		6	Fd	36	34	
		7	Fd	39.1	35	**712.67**
6	1022	1	Fd	36	29	
		2	Fd	31.2	24	
		3	Fd	17	17	
		4	Fd	21.4	18	
		5	Fd	17.3	17	
		6	Fd	31	23	**426.67**
2	1001	1	Fd	13.4	13	
		2	Fd	12.3	13	
		3	Ar		15	
		4	Ar		14	
		5	Pl	24.3	15	
		6	Fd	25	15	
		7	Fd	12	13	
		8	Fd	20.3	14	
		9	Fd	24	15	
		10	Fd	18.6	13	
		11	Fd	18	13	
		12	Fd	28.5	16	
		13	Fd	21.4	14	**610**
4	229	1	Fd	30.5	24	
		2	Fd	22.2	23	
		3	Fd	42.1	28	**250**
6	1002	1	Fd	28	25	
		2	Fd	38.1	28	
		3	Fd	40.2	29	
		4	Fd	51.1	29	
		5	Fd	20.5	23	**446.67**
7	1016	1	Fd	42.5	32	
		2	Fd	56.3	34	
		3	Fd	40	30	

		4	Fd	41	32	
		5	Fd	41	31	**530**
2	1018	1	Fd	45	33.1	
		2	Fd	29.5	30	
		3	Fd	47.6	34	
		4	Fd	32.1	29.8	**423**
Total						**561.61**

Table 6

Polygon ID	Area (ha)	Volume (per ha)							
		FD	CW	PI	PW	HW	DR	Total (per ha)	Stand Volume (m3)
947	10.32	395						395	4076.40
228	4.50							0	0.00
232	2.77							0	0.00
1016	2.53	476						476	1204.28
1001	1.35	132.8		33.2				166	224.10
1002	4.92	375.3	41.2					416.5	2049.18
1017	4.40							0	0.00
221	4.16							0	0.00
1003	10.16	769.5	40.5					810	8229.60
1018	3.47	476						476	1651.72
1004	1.97	435.2	54.4			27.2	27.2	544	1071.68
1015	5.67	560.7	62.3					623	3532.41
1007	1.11	338.4	18.8			18.8		376	417.36
1062	1.24	769.5	40.5					810	1004.40
1019	2.53	785						785	1986.05
206	4.35							0	0.00
207	3.79							0	0.00
1021	2.65	647.9	13.64			20.5		682.04	1807.41
1023	1.09	350						350	381.50
233	6.09							0	0.00
Total									27636.09

YR 2000 Vol. or adj. to current ?


Vancouver Island Land Use Plan
Map 3: Special Management Zones with Primary Visual Resource Values
LEGEND
Special Management Zones with Primary Visual Resource Values
Planning Area Boundary
SMZ 1
SMZ 2
SMZ 3
SMZ 7
SMZ 8
SMZ 10
SMZ 11
SMZ 12
SMZ 19
SMZ 13
SMZ 22
Land Use Coordination Office
Albers Equal Area Conic NAD83
BRITISH COLUMBIA

Map 6