

Sustainable Resource Management Plan

Biodiversity Chapter for

West Harrison Landscape Unit

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1.0 Introduction

This report provides background information used during the preparation of the Sustainable Resource Management Plan and associated proposed legal objectives for the West Harrison Landscape Unit (LU). Specifically, this report will form the biodiversity conservation chapter of the plan. A description of the planning unit, discussion on significant resource values, and an Old Growth Management Area (OGMA) summary and rationale are provided.

Biological diversity or biodiversity is defined as: *'the diversity of plants, animals and other living organisms in all their forms and levels of organisation, and includes the diversity of genes, species and ecosystems as well as the evolutionary and functional processes that link them'*¹. British Columbia is the most biologically diverse province in Canada. In British Columbia, 115 species or subspecies of known vertebrates and 364 vascular plants are listed for legal designation as threatened or endangered². The continuing loss of biological diversity will have a major impact on the health and functions of ecosystems and the quality of life in the province (Resources Inventory Committee, 1998).

Planning for OGMA and Wildlife Tree Patch (WTP) biodiversity values is recognized as a high priority for the province. LU planning is an important component of the *Forest Practices Code of BC Act (FPC)* which allows legal establishment of objectives to address landscape level biodiversity values. Implementation of this initiative is intended to help sustain certain biodiversity values. Managing for biodiversity through retention of old growth forests is not only important for wildlife, but can also provide important benefits to ecosystem management, protection of water quality and preservation of other natural resources. Although not all elements of biodiversity can be, or need to be, maintained on every hectare, a broad geographic distribution of old growth ecosystems is intended to help sustain the genetic and functional diversity of native species across their historic ranges.

The Chilliwack Forest District has completed draft LU boundaries and assigned draft Biodiversity Emphasis Options (BEO) in accordance with the direction provided by government. There are 24 LUs within the Chilliwack Forest District. Through a ranking process, the West Harrison LU was rated as a Low BEO, which requires that priority biodiversity provisions, including the delineation of Old Growth Management Areas and wildlife tree retention (WTR), be undertaken immediately. This work was completed by the Ministry of Sustainable Resource Management (MSRM), in cooperation with the Fraser TSA Cooperative Association, the BC Timber Sales Program, Sts'ailes Natural Resources Inc, Doman Western Lumber Products, and Northwest Hardwoods. Funding was provided by the Forest Investment Account and MSRM.

¹ FPC Biodiversity Guidebook, September 1995

² BC Species and Ecosystems Explorer. 2003. Victoria, British Columbia. Available at: <http://srmaps.gov.bc.ca/apps/eswp/>

Input from First Nations will be gathered during consultation (prior to public review) between MSRM and individual First Nations. Comment from the public and other agencies will be sought during the 60 day public review and comment period. Refer to the attached map for the location of OGMAs.

Supporting documentation regarding government policy, planning processes and biodiversity concepts are provided in the 1995 *Biodiversity Guidebook*, the 1999 *Landscape Unit Planning Guide* (LUPG), the *Vancouver Forest Region Landscape Unit Planning Strategy (1999)*, as well as *Sustainable Resource Management Planning Framework: A Landscape-level Strategy for Resource Development*.

2.0 West Harrison Landscape Unit Description

2.1 Biophysical Description

The West Harrison LU is situated on the west side of Harrison Lake, it extends south to the Harrison River and northwards to just north of Twenty Mile Creek. It's located predominantly north-west of Harrison Hot Springs, and abuts the Chehalis watershed further west at the height of land. The Landscape Unit covers a total area of 34,957 ha and includes several smaller stream systems tributary to Harrison Lake. Named watersheds within the LU include Weaver Creek, Walian Creek, Hale Creek, Mystery Creek, Twenty Mile Creek and Kirkland Creek, a few other smaller unnamed streams are present. Harrison Lake is a large fresh water lake that eventually joins the Fraser River just west of Chilliwack.

Of the total area, 22559 ha (65%) are within the Crown forested land base, and 19563 ha of Crown forest are within the Timber Harvesting Land Base (THLB). The remaining 12,398 ha (35%) are non-forested or non-Crown (rock, alpine tundra, water, private land etc.) and have been excluded from any OGMA contributions and calculations.

The entire LU is located within the Pacific Ranges Ecoregion, which is represented by the Southern Pacific Ranges ecosection. Climatic conditions vary most prominently by elevation. Climate in the lower elevation areas in the south and along Harrison Lake is characterized by warm, relatively dry summers and moist, mild winters with little snowfall. This combination produces a long growing season. At mid elevations in the LU climate is wet and humid with cool, short summers and cool winters featuring substantial snowfall. High elevations in the LU are characterized by long, wet, cold winters with high snowfall and short, cool, moist summers.

The West Harrison LU has five Biogeoclimatic (BEC) subzones or variants, which fall within three natural disturbance types (NDTs)³. The Mountain Hemlock variant – *windward* moist maritime (MHmm1) and the two Coastal Western Hemlock variants – *submontane* and *montane* very wet maritime (CWH vm1, CWHvm2) lie within NDT 1.

³ NDT1 encompasses those ecosystems with rare stand-initiating events. NDT2 includes ecosystems with infrequent stand initiating events. NDT5 is Alpine Tundra or other parkland ecosystems that are not considered forested. For a more complete description of NDTs see the *Biodiversity Guidebook* (1995).

The Coastal Western Hemlock dry maritime (CWHdm) falls within NDT2. The landscape unit also has small amounts of high elevation non-forested area in NDT5 (Alpine Tundra).

Most of the West Harrison LU has sustained substantial levels of disturbance. Forested stands on lower elevation productive sites (typically on slopes with low to moderate gradient) have been harvested. Higher elevation forested stands in this landscape unit are not as steep and inaccessible as some areas and have therefore also been harvested. The low levels of old seral forest remaining within these BEC variants reflect this disturbance history.

2.2 Summary of Land Status

Land status within the West Harrison LU is summarised in Table 1. The Crown forest land base summary is provided in Table 2.

Table 1. The range and distribution of land ownership status for the West Harrison Landscape Unit.

Code	Ownership class	Area (ha)	Percent of total area
40	Private and Crown grants	560	1.6
50	Federal Reserves	66	0.2
52	Indian reserve	773	2.2
61	Crown - UREP	753	2.2
62	Crown - contributing	32,278	92.3
69	Recreation sites and reserves	406	1.2
70	Crown - active Timber License	114	0.3
99	Crown – Miscellaneous Leases	8	<0.1
	Total Area	34,958	100.0

Table 2. Distribution of land area in the West Harrison Landscape Unit on the basis of Biogeoclimatic and Crown Forested Land Base classifications.

BEC Variant	Total Area (ha)	Crown Forested Land Base¹			Excluded Land Base²
		C	PC	NC	
CWH dm	24113	12309	142	1608	10055
CWH ds1	32	27	0	0	5
CWH ms1	2	0	0	2	0
CWH vm1	511	437	6	57	11
CWH vm2	6906	5464	119	588	734
MH mm1	2939	1242	51	447	1199
MH mm2	2	0	0	0	2
AT p	453	52	1	6	394
TOTAL	34958	19531	319	2708	12400

¹ The Crown Forested Land Base is comprised of Contributing (C), Partial Contributing (PC), and Non-Contributing (NC) areas of forested land. C and PC forest make up the Timber Harvesting Land Base (THLB) whereas the NC areas of forested lands do not contribute to the Allowable Annual Cut. The NC includes areas of Provincial Crown Forest considered inoperable due to one or more constraints (e.g., steep terrain, low productivity, which are netted down 100% during TSR analysis) and protected areas (e.g., Class A Provincial Parks and Ecological Reserves).

² The Excluded land base is comprised of areas of lands that are non-forest (e.g., rock, lakes, streams, non-productive brush, glacier) and areas of land that cannot be presumed to be maintained as forested ecosystems (e.g., private land or in the control of non-resource management agencies [e.g., The Federal Department of National Defense]).

3.0 Key Resource Tenure Holders

The general premise applied during the planning process was to identify key resource(s) tenure holdings. This assessment included identification of tenures that are administered by agencies such as the Ministry of Forests (MOF), Ministry of Energy and Mines and Crown corporations such as Land and Water British Columbia. For tenure holders, other than those administered by MOF, the management intent generally is to avoid placement of OGMA's within existing tenures. As for tenures administered by MOF, the management intent is to avoid placement of OGMA's over cutblocks and roads that have received approval status; and to minimize OGMA placement in areas that were identified as future harvest opportunities by licensees.

3.1 Forest Tenure Holders

Within the West Harrison plan area, several major licensees operate within volume based tenures which are predominantly forest licenses with a couple small timber licenses. The various licensees are: BC Timber Sales Program, Lakeside Pacific Forest Products Ltd., Teal Cedar Products Ltd., Sts'Ailes Natural Resources Ltd. and Doman Western Lumber Products. The OGMA's selected do not impact any known approved category "A" cutblocks or roads as identified by licensees during planning meetings.

Forest licensees were involved in the development of the East Harrison LU plan. The plan was developed through Forest Investment Account (FIA) funding with the initial work undertaken by the Fraser TSA Cooperative Association. Further plan development

was done in cooperation between MSRM and licensees operating within the LU. Efforts were made to ensure the impacts on future planned development are minimized.

3.2 Mineral Tenure Holders

There are approximately 15 mineral tenures located across the landscape unit. The selection of OGMA's tried to avoid placement over existing tenure holders. However, some overlap with 11 existing tenures occurred due to their wide spread locations within the Crown forest land base.

The establishment of OGMA's will not have an impact on the status of existing aggregate, geothermal, oil and gas, and mineral permits or tenures. Exploration and development activities are permitted in OGMA's. The preference is to proceed with exploration and development in a way that is sensitive to the old growth values of the OGMA; however, if exploration and development proceeds to the point of significantly impacting old growth values, then the OGMA will be moved.

4.0 Significant Resource Values

4.1 Fish, Wildlife and Biodiversity

Wildlife resources of primary management concern in the West Harrison LU are limited due to its extensive harvest history. Important species include: black-tailed deer, black bears (due to denning sites), fish and some species at risk that are considered "Identified Wildlife"⁴. Many other species occur including forest birds, raptors, small mammals, amphibians and furbearers but their populations are not extensive. Habitat requirements for these species are generally managed within habitat provisions provided for primary species, however, since relatively small amounts of mature and old forest exist there is limited opportunity for large populations. For example, winter range habitat for black-tailed deer in the West Harrison LU is provided in only a few mature or old forest stands (811 ha). These few stands are critically important for many species as potential 'lifeboats' and sources for recolonisation as the surrounding ecosystems stabilize.

All or a portion of the deer winter habitat areas are being considered for legal establishment as Ungulate Winter Range (UWR) under the FPC according to management plans developed by MWLAP (Freeman, 2001 & 2002). Some of the UWR overlaps with OGMA.

Most of the named stream systems support anadromous (lower reaches only) and/or resident salmonid populations. Riparian reserve zones established (as per the FPC) adjacent to these fish streams will help maintain fish and wildlife habitat. Where riparian areas have been logged, habitat will be provided in the future as it re-grows.

⁴ Volume 1 of the *Identified Wildlife Management Strategy* includes a list of 36 wildlife species and 4 plant communities that are considered to be at risk. These species or plant communities require special management of critical habitat to maintain or restore populations or distributions. Critical habitat is protected within Wildlife Habitat Areas. See the *Identified Wildlife Management Strategy Volume 1 February 1999* for more information.

Other species of Identified Wildlife (e.g. tailed frog) that may be discovered later may receive habitat protection with WHAs as well. In turn, these WHAs will help provide habitat for species not actively managed for. The Conservation Data Center has no records for sensitive species in this LU.

4.2 Timber Resources

The presence of a highly contributing timber harvesting land base establishes the importance of timber resource values. Continued access to commercially valuable timber, including future second growth, is a significant concern. First pass harvesting of accessible old growth timber is nearing completion.

Commercially valuable tree species in the West Harrison LU by elevation are: Douglas-fir, western hemlock and western red cedar at lower elevations. Mid elevation forests are dominated by amabilis fir, western hemlock and Douglas-fir, with lesser amounts of western red cedar. High elevation forests are dominated by amabilis fir and hemlock with minor amount of other species. Based on forest cover information, Table 3 shows the age composition of forests in the West Harrison LU.

Table 3. Age distribution of forests within the West Harrison Landscape Unit.

Age	% of Forested Land base within Provincial Forest
0-60	61%
61-140	27%
141-250	2%
251+	10%

Forest management activities occur throughout all phases of forest development. Operational work includes pre-harvest planning, harvesting and stand regeneration. Post harvest activities include planting, brushing, juvenile spacing, pruning and thinning.

4.3 Private Land

Only a few small parcels of private land occur within the West Harrison LU. Most of these are restricted to the south end of the LU north of the Harrison River. Several private recreational properties are also present along lower Harrison Lake. Hemlock Valley ski area is also located on private and leased land. The Chehalis Indian Reserve is located in the southern part of this LU near Morris Lake.

4.4 Water

There is one Community Watershed within the West Harrison Landscape Unit. Cohen Community Watershed is the water supply for Hemlock Valley Ski Area and the community around the ski hill.

4.5 Recreation

There are no provincial parks within the landscape unit, however many small Recreation Sites exist, with most located near small fishing lakes or rivers (e.g. Chehalis River, Weaver, Wolf, Grace, Francis). All are popular with the public and often busy through the summer months. Two established recreation trails are also present, one at Weaver Lake and the other near Mystery Creek. The latter offers spectacular views of Harrison Lake from an old Forest Lookout. Popular summer and fall recreational activities include: boating, fishing, camping, 4 wheel drive and ATV use, sightseeing, nature viewing and hiking. Overall the landscape unit receives moderate to heavy public use through the summer. Berry and mushroom picking occur and botanical forest products are also collected. Winter recreational activity (off the main forest service road) is normally restricted by seasonal road deactivation and snow accumulation, although snowmobiling could occur. Hemlock Valley Ski Area is a popular recreational facility located on the western boundary of the LU on Mt. Keenan. A private road provides access to skiers and other visitors.

At Weaver Creek, a federally operated sockeye salmon spawning channel exists that is open to the public for tours. This facility attracts many interested classes and families.

4.6 Sub-surface Resource Values

Subsurface resources (minerals, coal, oil, gas and geothermal) and aggregate resources are commodities valuable to the provincial economy. They are, however, difficult to characterise due to their hidden nature. Currently, comprehensive information is available for mineral potential in this area; aggregate potential for this LU has not been rated and no information regarding energy deposits was available to the planning team.

The Ministry of Energy and Mines has rated the metallic mineral potential of this area as moderate to high and the industrial mineral potential as moderate. Mineral Potential classifies the land base based upon the probability of discovering metallic or industrial mineral ore deposits in that area. Resource assessment tracts are based on areas of similar geology when assessed at the 1:250 000 scale. Mineral Potential classification was carried out on each tract with strong input from mineral industry experts and the use of other valuable databases such as MINFILE, exploration assessment reports, regional geochemical survey data, geophysical data, descriptive mineral deposit profiles and deposit models. Techniques used to derive Mineral Potential rankings followed those outlined in the United States Geological Survey Mineral Assessment Methodology⁵, with some modifications. Assessments of estimated undiscovered metallic resources were based on gross in place value (GIPV) and processed through the USGS Mark3B Mineral Resource Assessment Monte Carlo simulator⁶. Undiscovered industrial mineral assessments were based on Relative Deposit Value Score (RDVS). RDVS considers

⁵ Singer, D.A., 1993, Basic concepts in three-part quantitative assessments of undiscovered mineral resources: Nonrenewable Resources, v. 2, n. 2, p. 69-81.

⁶ Root, D.H., Scott, W.A. Jr. and Schruben, P (1998): Mark3B Resource Assessment Program for Macintosh; US Geological Survey, USGS Open File Report 98-356.

commodity unit value, potential markets, deposit grade and tonnage, transportation costs, infrastructure and extraction costs.

5.0 Existing Higher level Plans

Higher Level Plan objectives are one provision under the FPC that enables specific forest resource management objectives to be made legally binding. Legal objectives established under the Landscape Unit plan will be higher level plan objectives. It is important to note that operational plans must be consistent with higher level plan objectives.

6.0 First Nations

The West Harrison LU is located within the traditional territory of the Sto:lo Nation, Chehalis and Yale First Nations. The In-Shuck-ch First Nation traditional territory also extends into the north end of the landscape unit.

Between 1997 and 1999, an Archaeological Overview Assessment model was developed by MOF to indicate where archaeological sites are most likely located. This was done to minimize potential impacts by forestry operations on culturally important areas. The model was useful in predicting the location of habitation sites and high elevation campsites in the sub-alpine. Travel routes were also identified.

The maps from the model were reviewed to determine if archaeological potential sites or travel routes were captured in OGMAs. In the West Harrison LU, there is moderate overlap between OGMAs and old forest stands that exhibit a moderate to high potential for habitation sites, these sites are located on lower slope or valley bottom areas near lakeshores or streams. The maps did not indicate any potential travel routes within the Landscape Unit.

7.0 OGMA Methodology

7.1 Existing Planning Processes

In general, each LU contains varying amounts of mature/old forested habitat provided by existing processes (e.g. some LUs have spotted owl Special Resource Management Zones, some have protected areas) from which to build on for ecosystem management. The FPC ungulate winter range process, once completed, will also help provide a foundation for ecosystem management. In addition, Wildlife Habitat Areas that may be established in future will also improve connectivity; and in the long term, re-establishment of riparian reserve zones to old forest will improve upon ecosystem integrity. The habitat provided by these various processes together with OGMAs provide the fundamental components to achieve a functioning ecosystem. Specific to the West Harrison, habitat from existing processes is limited and does not provide much opportunity to build upon for biodiversity conservation.

An important part of the OGMA planning exercise was to ensure that these separate processes complemented each other, and as mentioned this was a challenge in the West Harrison LU. In this situation, strategic OGMA location was important.

OGMAs were placed within or adjacent to ungulate winter range to overlap constraints and to increase patch size. These larger patches then allow greater opportunity to improve connectivity between adjacent patches. The intent is to maintain (or build) a series of old forest habitat patches across probable movement corridors to allow wildlife dispersal and gene flow. Species such as deer are particularly susceptible to mortality in winter, connecting or aggregating OGMAs may help facilitate deer movement in addition to benefiting biodiversity. Using this approach with stand level biodiversity measures (e.g. Wildlife Tree Patches) will increase the likelihood of sustaining ecosystems and viable wildlife populations well distributed across their natural range.

7.2 Assessment and Review

OGMAs were selected based on a review of stand attributes in an effort to maximize their value from a biodiversity standpoint while minimizing timber supply impact. Spatial distribution of OGMAs throughout the LU was also a selection criterion. A specific rationale for the selection of each OGMA is shown in Appendix 1. In general, opportunities to recruit larger patches to provide for forest interior habitat conditions (to the recommended target) were favoured over smaller patches, although this was difficult in this LU. In this search, an effort was extended to minimize the impact on timber supply by combining areas in the non-contributing land base with areas in the timber harvesting land base. In addition, a significant number of smaller remnant patches containing old forest were delineated in conformance with the *Landscape Unit Planning Guidebook* (LUPG).

In the West Harrison Landscape Unit there was insufficient old forest (250+ years) in all four BEC variants to meet OGMA targets. It was necessary to designate younger aged immature and mature stands as recruitment OGMAs. Where possible, mature stands that had old forest attributes (e.g. snags, multi-layered canopy) or high resource values (e.g. potential deer winter range) were chosen as recruitment OGMAs.

7.3 Boundary Mapping

OGMA boundaries used natural or recognizable features, such as creeks or roads, wherever possible to ensure they could be located on the ground. OGMAs were also delineated to include complete forest stands (forest cover polygons) wherever possible to reduce operational uncertainty and increase ease of OGMA mapping. OGMAs were mapped using a 1:20000 scale TRIM base, which forms the legal standard for measurement. Procedures for operating within OGMAs are discussed in the OGMA Amendment policy.

7.4 Amendment Policy

An MSRM Coast Region policy has been developed and approved to give direction to proponents (forest tenure holders) when applying for amendments to OGMA legal objectives. Amendment procedures cover such things as minor or major amendments for resource development (e.g. roads, bridges, boundary issues, rock quarries & gravel pits) or relocation of OGMAs. The policy also discusses acceptable management activities and review procedures, and forms an integral part of this LU plan.

7.5 Mitigation of Timber Supply Impacts

During delineation of OGMAs for priority biodiversity provisions an attempt was made to mitigate the short and long-term impacts on timber supply. OGMAs were delineated first in the non-contributing forest land base. Since representation must be at the variant level, the non-contributing land base could not always satisfy old forest requirements because approximately 85% of the forested land base in the West Harrison LU is contributing. As a result, a higher percentage of the OGMAs are within the contributing land base than in most other LU plans.

OGMAs were chosen in the oldest available age class first, however, old forest stands that were approved or proposed for harvesting on Forest Development Plans (FDP) were excluded from candidate OGMAs following direction outlined in the *Landscape Unit Planning Guide*. Licensees also reviewed the maps and identified future harvesting opportunities so that timber supply impacts could be reduced wherever possible.

8.0 Landscape Unit OGMA Analysis for the West Harrison LU

8.1 West Harrison Landscape Unit

The West Harrison LU was ranked as a Low biodiversity emphasis option through the biodiversity value ranking process completed earlier (see the *Vancouver Forest Region Landscape Unit Planning Strategy*, 1999). This Low designation along with the BEC variant determines the percentage of the Crown forest land base that will be designated as OGMA. Table 4 outlines the total amount of OGMA required and actually established in each variant and from which Crown forest category (i.e. Non Contributing-NC; Timber Harvesting Land Base)⁷. The old growth target figures in Table 4 are derived from Appendix 2 in the *Landscape Unit Planning Guide*. See Appendix 1 for OGMA attributes and a rationale; and the attached map for location of OGMAs.

⁷ Non Contributing (NC) forest land does not contribute to the Allowable Annual Cut. The Timber Harvesting Land Base (THLB) is made up of Contributing (C) forests and a portion of the Partially Contributing (PC) forests. Partially Contributing forests are “constrained” due to one of several factors such as unstable soils or wildlife habitat, but are still partially available for harvest. Contributing forest is unconstrained and available for timber harvest.

Table 4. Old growth management area (OGMA) requirements for the West Harrison Landscape Unit.

BEC Variant	Full OGMA Target (ha)	Established OGMA (ha)	Delineated OGMA							
			Non-Contributing (NC)				Part. Contrib. (PC)		Contributing (C)	
			Protected Areas		Non-PA					
			%	ha	%	ha	%	ha	%	ha
CWHdm	1233	1238.9	0	0	50.0	619.1	6.6	82.3	43.4	537.5
CWHms1	0	1.5	0	0	100.0	1.5	0	0	0	0
CWHvm1	65	70.7	0	0	50.5	35.7	8.5	6.0	41.0	29.0
CWHvm2	802	809.3	0	0	41.4	334.9	3.6	29.2	55.0	445.2
MHmm1	331	334.8	0	0	74.7	250.0	7.4	24.8	17.9	60.0
Total	2431	2455.2	0	0	50.6	1241.3	5.8	142.3	43.7	1071.7

NDT 1: CWHvm1, CWHvm2, MHmm1.

NDT 2: CWHdm, CWHms1

9.0 Wildlife Tree Retention

Wildlife tree retention is managed at the stand level and maintains structural diversity within managed stands by retaining wildlife trees immediately adjacent to or within cutblocks. The WTR percentage by BEC subzone is described in Table A of the *Legal Objectives*. Retention percentages will meet the targets outlined in the LUPG for each BEC subzone.

The retention percentage does not have to be fully implemented on a cutblock-by-cutblock basis. Instead, the retention target may apply over a larger area (e.g. FDP or equivalent), so long as the retention target is met each 2 year period. The intent is to provide limited flexibility at the cutblock level provided that the legally required percentage is met across the subzone. Since wildlife tree retention is a stand level biodiversity provision, wildlife tree patches are also to be distributed across each subzone and the landscape unit.

10.0 Landscape Unit Plan Objectives

Landscape unit objectives will be legally established within the framework of the FPC and as such will become Higher Level Plan objectives. Other Operational Plans must be consistent with these objectives.

OGMA and WTR Landscape Unit objectives apply only to Provincial forest lands. While park and Crown forest lands outside of provincial forest may contribute to old seral representation, LU Objectives do not apply to these areas.

11.0 Appendices

Appendix 1 – OGMA Summary and Rationale – West Harrison LU

Appendix 2 – Acronyms

Appendix 3 – Public Consultation Summary

APPENDIX 1: OGMA SUMMARY AND RATIONALE – West Harrison LU

OGMA #	BEC VARIANT	CONTRIB. CLASS	OGMA AREA	THLB AREA	COMMENTS	FDP	WILDLIFE
2	CWH dm	C	1.3	1.3	Limited low elev old forest, riparian		
2	CWH dm	N	18.4	0.0			
2	CWH dm	P	0.8	0.1			
3	CWH ms 1	N	1.5	0.0			
3	CWH vm 2	C	18.3	18.3			
3	CWH vm 2	N	25.2	0.0			
3	CWH vm 2	P	0.2	0.0			
5	CWH vm 2	N	7.3	0.0			
10	CWH dm	C	22.2	22.2	Large patch, mix of old & young recruitment forest		
10	CWH dm	N	21.3	0.0			
10	CWH dm	P	0.1	0.0			
10	CWH vm 2	C	0.3	0.3			
10	CWH vm 2	N	0.4	0.0			
11	CWH dm	C	0.1	0.1	Limited low elev old forest		
11	CWH dm	N	6.7	0.0			
12	CWH vm 2	C	7.9	7.9			
13	CWH vm 2	C	8.0	8.0			
13	CWH vm 2	N	3.8	0.0			
13	MH mm 1	N	4.2	0.0			
16	CWH vm 2	N	0.4	0.0			
16	MH mm 1	N	6.5	0.0			
18	CWH vm 2	C	32.5	32.5	Riparian	Agreed to by licensee	
18	CWH vm 2	N	19.3	0.0			
18	CWH vm 2	P	0.3	0.0			
19	CWH vm 1	C	0.5	0.5	Riparian		
19	CWH vm 2	C	14.5	14.5	Wider patch add value to riparian strip	Agreed to by licensee	

OGMA #	BEC VARIANT	CONTRIB. CLASS	OGMA AREA	THLB AREA	COMMENTS	FDP	WILDLIFE
19	CWH vm 2	N	17.2	0.0			
19	CWH vm 2	N	9.5	0.0	mapped as X, forested		
22	CWH dm	C	1.2	1.2	Riparian, limited low elev old forest, wider patches add value to riparian strip		
22	CWH dm	N	41.4	0.0			
22	CWH dm	P	0.1	0.0			
22	CWH vm 1	C	3.8	3.8			
22	CWH vm 1	N	6.8	0.0			
24	CWH vm 2	C	4.7	4.7			
24	CWH vm 2	N	1.5	0.0			
24	CWH vm 2	N	7.7	0.0	mapped as X, forested		
24	MH mm 1	N	2.4	0.0			
24	MH mm 1	N	3.1	0.0	mapped as X, forested		
26	CWH vm 2	C	11.2	11.2		Agreed to by licensee	
26	CWH vm 2	N	0.5	0.0			
32	CWH vm 2	N	0.1	0.0			
32	MH mm 1	N	16.9	0.0			
33	CWH vm 2	C	5.7	5.7			
33	CWH vm 2	N	0.2	0.0			
33	CWH vm 2	N	2.6	0.0	mapped as X, forested		
34	MH mm 1	N	5.4	0.0			
35	MH mm 1	N	9.8	0.0			
36	CWH vm 2	N	3.6	0.0			
37	CWH vm 2	C	42.1	42.1	Large patch	Agreed to by licensee	
37	CWH vm 2	N	22.1	0.0			
39	CWH vm 2	C	2.9	2.9			
39	CWH vm 2	N	9.1	0.0			
39	CWH vm 2	N	0.4	0.0	mapped as X, forested		
39	MH mm 1	N	0.4	0.0			

OGMA #	BEC VARIANT	CONTRIB. CLASS	OGMA AREA	THLB AREA	COMMENTS	FDP	WILDLIFE
44	CWH vm 2	N	0.2	0.0			
44	MH mm 1	N	17.8	0.0			
45	CWH vm 2	C	7.9	7.9	Riparian		
45	CWH vm 2	N	33.3	0.0			
45	MH mm 1	N	3.2	0.0			
46	CWH dm	C	16.1	16.1			DWR
46	CWH dm	N	1.0	0.0			
47	CWH vm 1	C	1.7	1.7			
47	CWH vm 1	P	6.0	0.6			
50	CWH dm	N	17.6	0.0			
51	CWH dm	N	1.9	0.0			
51	CWH vm 2	N	0.2	0.0			
52	CWH dm	C	5.8	5.8	Lakeshore riparian		
52	CWH dm	N	6.9	0.0			
53	CWH dm	C	26.1	26.1	Part of OGMA is limited old forest, large patch, lakeshore riparian	Cutblock adjacent, areed to by licensee	
53	CWH dm	N	8.9	0.0			
54	CWH vm 2	C	28.6	28.6	Riparian		
54	MH mm 1	C	0.3	0.3			
55	CWH vm 2	C	10.0	10.0			
56	CWH dm	C	1.6	1.6	Lakeshore riparian		Partial DWR
56	CWH dm	N	30.7	0.0			
56	CWH dm	P	9.1	0.9			
58	CWH vm 2	C	2.8	2.8			
59	CWH vm 2	C	4.4	4.4			
60	CWH vm 2	C	20.1	20.1			
60	CWH vm 2	N	3.2	0.0			
60	MH mm 1	N	2.3	0.0			
61	MH mm 1	N	11.3	0.0			

OGMA #	BEC VARIANT	CONTRIB. CLASS	OGMA AREA	THLB AREA	COMMENTS	FDP	WILDLIFE
62	CWH dm	C	0.4	0.4			
62	CWH vm 2	C	16.0	16.0	Riparian		
63	CWH dm	C	28.4	28.4	Large patch, lakeshore riparian	Agreed to by licensee	DWR
63	CWH dm	P	32.2	3.2			
65	CWH dm	N	4.9	0.0	Limited low elev old forest, lakeshore riparian,		
66	CWH dm	C	26.2	26.2	Limited low elev old forest, stream & lakeside riparian		
66	CWH dm	N	0.3	0.0			
66	CWH dm	P	13.5	1.4			
68	CWH dm	N	11.6	0.0	Limited low elev old forest, lakeshore riparian		
69	CWH dm	C	40.0	40.0	Part of OGMA is limited old forest, riparian & wetland	Cutblock adjacent	
70	CWH vm 2	C	3.8	3.8			
74	CWH vm 2	C	37.0	37.0	Riparian		
76	CWH dm	C	48.8	48.8	Lakeshore riparian		
77	CWH dm	C	9.2	9.2			
82	CWH vm 2	C	2.6	2.6			
83	CWH vm 2	C	21.3	21.3			
85	CWH vm 2	C	2.2	2.2			
91	MH mm 1	C	0.3	0.3			
91	MH mm 1	P	13.3	1.3			
93	CWH dm	C	4.7	4.7	Small island in Harrison Lake		
93	CWH dm	N	0.4	0.0			
95	CWH vm 2	C	2.6	2.6		Cutblock adjacent, agreed to by licensee	
95	CWH vm 2	N	6.1	0.0			
95	MH mm 1	C	15.7	15.7			
95	MH mm 1	N	3.6	0.0			
96	CWH dm	N	7.8	0.0	Big tree reserve – old forest		

OGMA #	BEC VARIANT	CONTRIB. CLASS	OGMA AREA	THLB AREA	COMMENTS	FDP	WILDLIFE
97	CWH vm 2	C	14.0	14.0		Cutblock adjacent	
98	CWH vm 2	C	2.1	2.1			
98	CWH vm 2	N	9.4	0.0			
99	MH mm 1	C	27.3	27.3	Large patch	Agreed to by licensee	
99	MH mm 1	N	19.0	0.0			
100	CWH dm	C	14.6	14.6	Limited low elev old forest, riparian	Cutblock adjacent, agreed to by licensee	
100	CWH dm	P	17.7	1.8			
101	CWH vm 2	C	13.2	13.2	Riparian	Agreed to by licensee	
101	CWH vm 2	N	0.2	0.0			
101	CWH vm 2	P	26.3	2.6			
104	CWH dm	C	18.1	18.1	Riparian	Cutblock adjacent	
106	CWH vm 2	C	9.3	9.3			
106	CWH vm 2	N	12.8	0.0			
106	MH mm 1	N	4.9	0.0			
108	CWH vm 2	C	5.4	5.4			
108	MH mm 1	C	2.3	2.3			
109	MH mm 1	N	5.0	0.0			
110	CWH dm	C	5.0	5.0			
110	CWH dm	N	2.7	0.0			
111	CWH dm	N	0.2	0.0			
111	CWH vm 2	N	5.6	0.0			
112	CWH vm 2	C	54.1	54.1	Large patch, interior forest, cross elev linkage, north end adjacent to Hemlock ski hill	Agreed to by licensee	
112	CWH vm 2	N	78.4	0.0			
112	MH mm 1	N	19.6	0.0			
117	CWH vm 2	C	4.6	4.6			
118	CWH vm 2	N	0.8	0.0			
118	MH mm 1	N	3.9	0.0			
119	CWH dm	N	11.2	0.0	Limited low elev old forest,		

OGMA #	BEC VARIANT	CONTRIB. CLASS	OGMA AREA	THLB AREA	COMMENTS	FDP	WILDLIFE
					lakeshore riparian,		
121	CWH dm	C	11.7	11.7	Limited low elev old forest		DWR
122	CWH dm	N	19.2	0.0	Adjacent to Weaver Lk		
124	CWH vm 2	C	20.9	20.9	Large patch, interior forest, riparian	Agreed to by licensee	
124	CWH vm 2	N	39.1	0.0			
124	MH mm 1	C	0.8	0.8			
124	MH mm 1	N	109.1	0.0			
125	CWH dm	N	5.6	0.0	Island in Weaver Lake		
126	CWH dm	N	75.5	0.0	Large patch, streamside & lakeshore riparian		
128	CWH dm	C	10.3	10.3	Lakeshore riparian		
132	CWH dm	C	17.6	17.6			
132	CWH dm	N	115.1	0.0	Large patch, riparian		Partial DWR
135	CWH dm	C	37.1	37.1	Lakeshore riparian		
136	CWH dm	N	24.8	0.0	Lakeshore & streamside riparian		
140	CWH dm	N	120.7	0.0	Lakeshore & streamside riparian		Partial DWR
141	CWH dm	N	15.2	0.0			
145	CWH vm 1	C	23.0	23.0	Riparian		
145	CWH vm 1	N	28.9	0.0		Cutblock adjacent	
146	CWH dm	P	8.9	0.9	Riparian, limited low elev old forest		
147	CWH dm	C	19.6	19.6	Riparian	Cutblock adjacent	
148	CWH vm 2	N	0.8	0.0			
148	MH mm 1	C	11.9	11.9			
148	MH mm 1	N	1.7	0.0			
149	CWH vm 2	C	8.3	8.3			
149	CWH vm 2	P	2.5	0.3			
149	MH mm 1	C	1.5	1.5			

OGMA #	BEC VARIANT	CONTRIB. CLASS	OGMA AREA	THLB AREA	COMMENTS	FDP	WILDLIFE
149	MH mm 1	P	11.5	1.2			
150	CWH vm 2	N	10.0	0.0			
151	CWH dm	C	40.5	40.5	Lakeshore riparian	Cutblock adjacent, agreed to by licensee	
154	CWH dm	C	19.6	19.6	Part of OGMA is limited low elev old forest	Cutblock adjacent	DWR
154	CWH dm	N	0.9	0.0	Lakeshore riparian		
155	CWH dm	C	18.1	18.1	Limited low elev old forest	Cutblock adjacent, agreed to by licensee	
156	CWH dm	C	28.8	28.8			
157	CWH dm	C	2.2	2.2			
157	CWH dm	N	19.9	0.0			
160	CWH dm	C	16.1	16.1	Lakeshore riparian, wetland, part of OGMA in limited low elev old forest	Agreed to by licensee	
160	CWH dm	N	6.1	0.0			
161	CWH dm	C	5.8	5.8	Limited low elev old forest, lakeshore riparian,	Cutblock adjacent, agreed to by licensee	
162	CWH dm	C	9.4	9.4	Cutblock adjacent		
163	CWH dm	C	1.6	1.6	Lakeshore riparian, limited low elev old forest		
163	CWH dm	N	3.1	0.0	Lakeshore riparian, limited low elev old forest		
164	CWH dm	C	3.3	3.3			
164	CWH dm	N	7.2	0.0			
165	CWH dm	C	10.0	10.0	Limited low elev old forest		
166	CWH vm 2	C	4.2	4.2			
166	CWH vm 2	N	0.2	0.0	mapped as X, forested		
167	CWH vm 2	C	2.7	2.7			
167	CWH vm 2	N	0.8	0.0			
167	CWH vm 2	N	3.0	0.0	mapped as X, forested		
168	CWH dm	C	4.3	4.3			Partial DWR

OGMA #	BEC VARIANT	CONTRIB. CLASS	OGMA AREA	THLB AREA	COMMENTS	FDP	WILDLIFE
168	CWH dm	N	0.7	0.0	mapped as X, forested		
169	CWH dm	C	12.3	12.3			
169	CWH dm	N	6.3	0.0			
169	CWH dm	N	5.7	0.0	mapped as X, forested		

Abbreviations: Elev = elevation
DWR = deer winter range

Appendix 2: Acronyms

AAC	Allowable Annual Cut
BCTS	BC Timber Sales, administered by MOF
BEC	Biogeoclimatic Ecosystem Classification
BEO	Biodiversity Emphasis Option
C	Contributing
CMT	Culturally Modified Tree
CWS	Community Watershed
DDM	Delegated Decision Maker
FPC	Forest Practices Code of British Columbia Act
GBPU	Grizzly Bear Population Unit
IWMS	Identified Wildlife Management Strategy
LU	Landscape Unit
LUPG	Landscape Unit Planning Guide
MELP	Ministry of Environment, Lands and Parks, now called MWLAP
MEM	Ministry of Energy and Mines
MOF	Ministry of Forests
MSRM	Ministry of Sustainable Resource Management
MWLAP	Ministry of Water, Land and Air Protection
NC	Non-contributing
NDT	Natural Disturbance Type, see Biodiversity Guidebook
OGMA	Old Growth Management Area
PC	Partially Contributing
RRZ	Riparian Reserve Zone
THLB	Timber Harvesting Land Base
UWR	Ungulate Winter Range
WHA	Wildlife Habitat Area
WTP	Wildlife Tree Patch
WTR	Wildlife Tree Retention

Appendix 3: Public Consultation Summary

The 60-day public review and comment period for the West Harrison Landscape Unit extended from 4 January through to 4 March 2005. Prior to the public consultation period, MSRM staff met with local forest licensees to address their concerns and craft a plan that minimised impacts to timber supply (Section 3.1). Ongoing discussions with the Ministries of Forests and Water, Land and Air Protection, regarding the development of the landscape unit objectives and placement of OGMA's for the West Harrison LU, took place throughout the course of plan development. MSRM staff advised mineral tenure holders of OGMA placement and landscape unit objectives (Section 3.2). An overview of the noteworthy aspects of MSRM's consultations and the specific comments received on the draft plan and LU objectives follows.

Consultations with First Nations

MSRM staff consulted with First Nation organisations with traditional territory in the West Harrison Landscape Unit: the Cheam Indian Band, Chehalis First Nation, In-SHUCK-ch Council, Stó:lô Nation and Yale First Nation. General interest in LU planning was conveyed by the Cheam Indian Band and Chehalis First Nation and an information meeting was conducted with members of the In-SHUCK-ch Council in the Fall of 2004. With the exception of Chehalis First Nation, no comments pertaining to LU-level planning were submitted by any of these First Nations during the review and comment period. MSRM met with Chehalis First Nation's Forest Planner in early May to discuss planning at the LU level and ways for Chehalis and MSRM to engage in resolving issues of common interest within the scope of LU Planning at this time.

Comments regarding maximising the overlap between OGMA's and other constrained areas in the THLB

As some time has elapsed between the development of the initial plan and its approval, some licensees are now considering development in areas where OGMA placement was once non-contentious. Notably, Ungulate Winter Ranges and Wildlife Habitat Areas have since become more defined in their location and extent. MSRM consulted with affected licensees during plan development to forge agreement on OGMA size and placement. Staff used the best information available at the time with respect to special management areas within the THLB (e.g., UWRs, WHAs). MSRM has committed to an ongoing process of rationalising OGMA location with other THLB constraints.

Comments regarding amending OGMA locations

One licensee expressed concern that certain OGMA's appear to be excluded from development as outlined in Landscape Unit Objectives for the West Harrison Landscape Unit—specifically Landscape Unit Objective 1, Section 2(1-4). Obj. 1, S. 2(4) defines specific OGMA's and OGMA classes that are sufficiently critical for the conservation of biodiversity within the West Harrison LU that an elevated degree of oversight by MSRM is necessary prior to approving amendments to the location or extent of, and permissible activities in these particular OGMA's: changes to the boundaries, location, or develop in any of these OGMA's are not specifically prohibited but review and approval by MSRM is necessary before on-the-ground changes are implemented. This sets this class of

OGMAs apart from those which currently possess less rare habitat attributes wherein licensees are empowered to amend OGMA locations and boundaries without prior approval of MSRM—i.e., consistent with Objective 1, Section 2 (1-3)—subject to the areal limits outlined in Objective 1, Section 2 (1-2). This issue was clarified for the licensee and was found to be consistent with the procedure MSRM had developed in consultation with affected licensees.

Comments from holders of mineral tenures

Some concerns regarding the need for this form of planning were voiced by a claim holder in the initial planning stages. No further comments were received during the public review and comment period. Land use policies are clear on the process for resolving conflicts between sub-surface resource development and delineated OGMAs (Section 3.2).

Comments from citizens of Harrison Hot Springs

Two members of the Harrison Hot Springs community provided comments to MSRM respecting the need for enhanced biodiversity and viewscape conservation in the West Harrison Landscape Units. The Biodiversity Emphasis Option for this LU (i.e., low) cannot accommodate increased constraints to the THLB in the West Harrison LU beyond the levels imposed by the current LU plan. Government policy is clear on the level of timber supply impact associated with the implementation of Landscape Unit planning and OGMA delineation.

Comments from the Mayor and Council of the Village of Harrison Hot Springs

Mayor and Council of the Village of Harrison Hot Springs expressed concern with respect to what they perceived as the ‘inadequacy’ of LU planning when considering the protection of certain non-timber resources values—specifically visual quality as it relates to local tourism. At this time, government policy with respect to Landscape Unit planning is to concentrate on the implementation of ‘priority’ biodiversity measures—i.e., the establishment of OGMAs and WTPs with their associated legal objectives. As such, the Mayor and Council’s concerns fall beyond the scope of LU planning at this time.