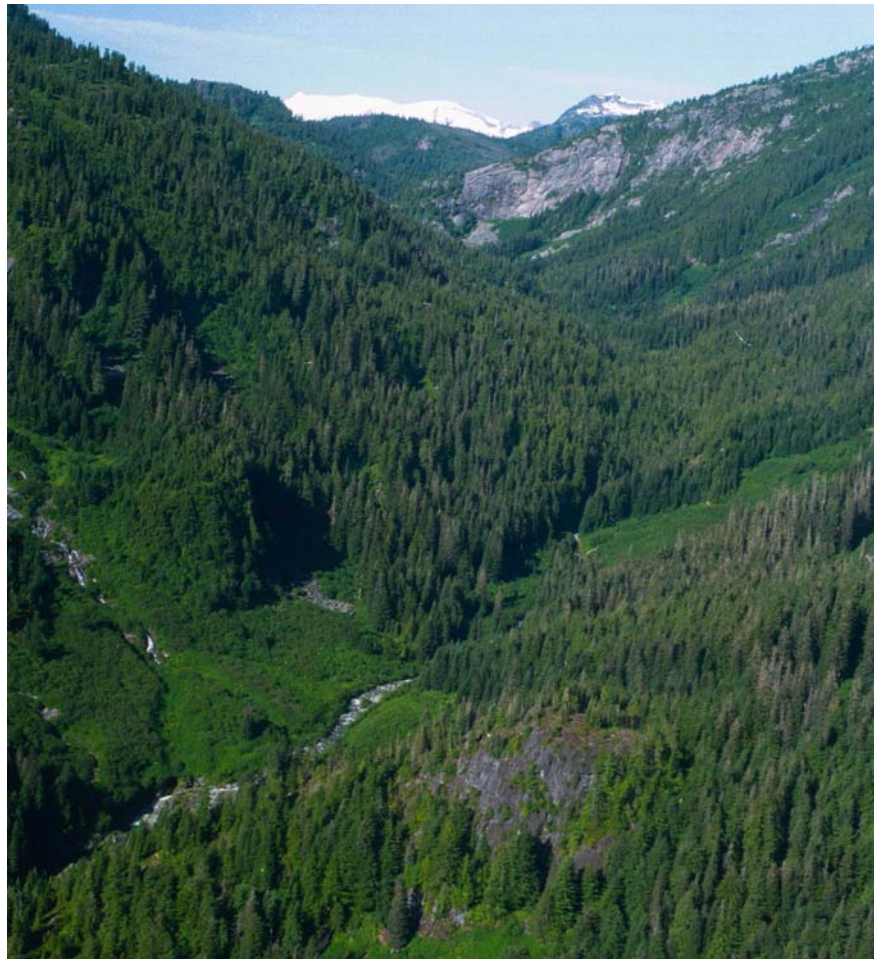


# Sustainable Resource Management Plan

## Biodiversity Chapter for Ryan 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 Ryan Landscape Unit (LU). Specifically, this report forms 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’*<sup>1</sup>. 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 endangered<sup>2</sup>. 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 Squamish Forest District has completed draft LU boundaries and established draft Biodiversity Emphasis Options (BEO) in accordance with the direction provided by government. There are 20 LUs within the Squamish Forest district. Through a ranking process, the Ryan 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 Terminal Forest Products Ltd. and CRB Logging Ltd. Funding was provided by the Forest Investment Account and MSRM.

Input from First Nations was gathered during consultation between MSRM and individual First Nations. Comment from the public and other agencies was sought during

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<sup>1</sup> FPC Biodiversity Guidebook, September 1995

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

the 60 day public review and comment period (Appendix 3). Refer to the attached map for location of OGMA's and old growth representation from protected areas.

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 Ryan Landscape Unit Description**

### **2.1 Biophysical Description**

The Ryan LU lies on the lee side of the Pemberton Range in a coast-interior transition zone. It is located north-west of the town of Pemberton and is tributary to the Lillooet River. The Ryan LU covers a total of 59304 hectares encompassing both the Ryan River watershed and two smaller watersheds (Miller Creek and Pemberton Creek) which flow directly into the Lillooet River.

Of the total area, 16,185 hectares (27%) are within the Crown forest land base (productive forest), and 6,151 hectares of Crown forest (10% of the total LU area) are included in the Timber Harvesting Land Base (THLB). The remaining 43,119 hectares are non-forested or non-Crown (rock, alpine tundra, water, ice, and private land) and have been excluded from any OGMA contributions and calculations.

The Ryan LU lies within the Pacific Ranges Ecoregion, Southern Pacific Ranges Ecoregion. Climatic conditions are best described as subarctic with warm dry summers and cool wet winters with the majority of the precipitation occurring as snow in the fall and winter. Existing icefields and the snowpack feeds the landscape unit stream network.

There are four biogeoclimatic (BEC) subzones or variants within the Ryan Landscape Unit, which fall within three natural disturbance types (NDTs)<sup>3</sup>. The Mountain Hemlock *leeward* moist maritime (MH mm2) falls within NDT 1, the Coastal Western Hemlock *southern* dry subarctic (CWHds1) and CWH *southern* moist subarctic (CWHms1) within NDT 2, and the Alpine Tundra (AT unp) in NDT 5.

### **2.2 Summary of Land Status**

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

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<sup>3</sup> NDT1 includes ecosystems with rare stand-initiating events. NDT2 encompasses ecosystems with infrequent stand-initiating events. NDT5 includes alpine tundra and subalpine parkland ecosystems that are not considered forested. For more information see the 1995 *Biodiversity Guidebook*.

**Table 1 Land Status of the Ryan Landscape Unit.**

Code	Ownership class	Ryan LU (Hectares)	Percent of total area
40	Private and Crown grants	4738.2	8.0%
62	Crown contributing	50,627.6	85.4%
63	Parks	63.3	0.1%
69	Crown Misc. Reserves	2,906.6	4.9%
70	Timber license	590.9	1.0%
75	Christmas Tree Permit	4.6	0.0%
76	Crown and Private TFL	353.1	0.6%
99	Crown Misc. Leases	20.3	0.0%
	<b>Total Area</b>	<b>59,304.6</b>	<b>100.0%</b>

**Table 2. Land status using Crown forest land base classifications.**

BEC Unit	Area (ha)	Crown Forested Land Base*			Excluded Land Base
		C	PC	NC	X
CWH ds1	9,014.1	1,921.8	224.3	957.5	5,910.5
CWH ms1	10,884.7	3,588.6	691.6	3,182.0	3,422.5
MH mm2	12,436.5	395.3	95.0	4,825.7	7,120.5
AT unsp	26,968.5	3.3	0	300.2	26,968.5
<b>TOTAL</b>	<b>59,303.8</b>	<b>5,909.0</b>	<b>1,010.9</b>	<b>9,265.4</b>	<b>43,422.0</b>

\* The Crown Forested Land Base is comprised of Contributing (C), Partial Contributing (PC), and Non-Contributing forests. Contributing and Partial Contributing forest make up the Timber Harvesting Land Base. Non-Contributing forest land does not contribute to the Allowable Annual Cut.

### 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 (MEM) 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 OGMAs within existing tenures. As for tenures administered by MOF, the management intent is to avoid placement of OGMAs 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 Ryan plan area, volume based tenures have been made available to licensees such as Terminal Forest Products Ltd., CRB Logging Ltd., and a small area to BC Timber Sales Program (administered by MOF). The OGMAs selected do not impact any

known approved category “A” cutblocks or roads as approved under a Forest Development Plan. Furthermore, discussions with key licensees have taken place to ensure that the intent of this LU plan is conveyed and impacts on future planned development is minimized.

### **3.2 Mineral Tenure Holders**

There are three mineral tenures within the landscape unit, all three are adjoined and located south of the Ryan River. The selection of OGMA's followed the intent of avoiding placement over existing tenure holders, and only one OGMA overlaps with a mineral tenure.

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 Ryan LU include: grizzly bear, mountain goat, mule deer, fish and some species at risk that are considered “Identified Wildlife”<sup>4</sup>. Many other species occur including forest birds, raptors, small mammals, amphibians and furbearers but their habitat requirements are generally managed within habitat provisions provided for primary species. For example, forested habitat for mountain goats in the Ryan LU is maintained within several established and approved mountain goat winter ranges (Crown forest total area of 663 ha). This productive forest portion would also support other species using old forests.

The Ryan LU is also an important area for mule deer with 782 ha of deer winter range (Classic, Crown forest only) identified by MWLAP. All or a portion of this area is being considered for legal establishment as Ungulate Winter Range (UWR) under the FPC according to a Deer Winter Range Management Plan (Freeman, 2002). Some of the DWR overlaps with Spotted Owl SRMZ and some of each species' habitats (i.e. deer and mountain goats) have been captured in OGMA. The habitat maintained for ungulates would also benefit other species.

Further, most of the Ryan River and its major tributaries, and Pemberton and Miller Creek, support resident and anadromous salmonid populations. Riparian reserve zones established (as per the FPC) adjacent to these fish streams will help maintain fish and

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<sup>4</sup> 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.

wildlife habitat. Where riparian areas have been logged, habitat will be provided in the future as it re-grows.

Grizzly bears in the Ryan LU are part of the threatened Squamish-Lillooet grizzly bear population unit (a Recovery Plan is not yet written) and are also an Identified Wildlife species. Provisions exist within the Identified Wildlife Management Strategy to protect some critical foraging or security habitat within Wildlife Habitat Areas (WHA). Designation of WHAs may occur as necessary or as part of the Recovery Plan to protect additional grizzly bear habitat in the Ryan LU. Other species of Identified Wildlife (e.g. northern goshawk, 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.

#### 4.2 Timber Resources

The presence of a substantial timber harvesting land base (as compared to the overall amount of productive forest) 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 Ryan LU are best described by elevation. At lower elevations Douglas-fir and western hemlock dominate with lesser amounts of western red cedar. At mid elevations forests are dominated by western hemlock, Douglas-fir, western red cedar and amabilis fir. High elevation forests are dominated by amabilis fir and mountain hemlock with subalpine fir being less common. Additionally there is a minor component of deciduous species such as cottonwood, birch and maple. Based on forest cover information, Table 3 shows the age composition of forests in the Ryan LU.

**Table 3. Age distribution of forests within the Ryan Landscape Unit.**

<b>Age</b>	<b>% of Forested Landbase within Provincial Forest</b>
0-60	25.2%
61-140	7.2%
141-250	23.8%
251+	43.8%

Approximately 54% of the forested sites are poor sites and 27% are medium sites. Good sites constitute 3% of the forested area and low sites the remainder.

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**

The eastern fringe of the Ryan LU lies within the Lillooet River valley. This is a large fertile valley important for agriculture and is almost entirely privately owned. Most of the private land has been cleared for agriculture purposes. Where ecologically appropriate, OGMAs adjoin private land.

### **4.4 Water**

There are no community watersheds within the Ryan Landscape Unit. Water licenses for agricultural and domestic purposes do exist.

### **4.5 Recreation**

The Nairn Falls Protected Area is the only park in this landscape unit. It is located in the southeast corner of the LU adjacent to Highway 99. This portion of the LU within the Highway 99 corridor is important for backcountry and heli-skiing recreational activities during the winter months. Other winter recreational activity is normally restricted by seasonal road deactivation and snow accumulation, although snowmobiling occurs on road systems or alpine/glacier areas (e.g. Pemberton glacier).

In snow-free conditions, recreational hunting in the Ryan LU is an annual activity enjoyed by many outdoor enthusiasts; most hunters would target black bears or deer. Stream angling opportunities may exist in the lower reaches of the Ryan River. ATV, motorcycle and four wheel drive use of roads for recreation occurs to varying degrees. Trail hiking, berry and mushroom picking and wildlife viewing/sight seeing also occurs.

There are no Forest Service Recreation Sites in the Ryan LU, and no development plans for the immediate future.

### **4.6 Mineral Resources**

Subsurface resources (minerals, coal, oil, gas and geothermal) and aggregate resources are valuable to the province, but are difficult to characterize due to their hidden nature. Ministry of Energy and Mines has rated the metallic mineral potential of this area as moderately high. The aggregate potential has been rated as high immediately along the Lillooet River and Lower Ryan River and low elsewhere. The geothermal potential has been rated as high in the western half of the LU. These rankings are based on a qualitative analysis which takes into account the value of known resources, past exploration and production as well as the number of known mineral occurrences and a subjective probability estimate of value by industry experts.

## **5.0 Existing Higher level Plans**

Higher Level Plan objectives are one provision under the FPC that enable specific forest resource management objectives to be made legally binding. Legal objectives established under the Landscape Unit plan are higher level plan objectives. In part of the Ryan LU, the Spotted Owl Management Plan has been approved and may be considered for higher



level plan status with legal objectives. It is important to note that operational plans must be consistent with higher level plan objectives.

In addition, the Sea to Sky Land and Resource Management Plan (LRMP) is an ongoing higher level plan that includes the Ryan Landscape Unit. For more information, refer to the Sea to Sky LRMP website (<http://srmwww.gov.bc.ca/rmd/lrmp/s2s/index.htm>).

## **6.0 First Nations**

The Ryan LU is located within the traditional territory of the Stl'atl'imx First Nation (Mount Currie). There is evidence of traditional use in several areas including: trails and Culturally Modified Trees.

Between 1996 and 1997, an Archaeological Overview Assessment model was developed by Millenia Research on behalf of MOF to indicate where archaeological sites are most likely to be located. This was done to minimize potential impacts by forestry operations on culturally important areas. The model was useful in predicting the potential location (i.e. high or moderate potential) of habitation sites, trails and Culturally Modified Trees (CMTs).

The maps from the model were reviewed to determine if archaeological potential sites or travel routes were captured in OGMAs. In the Ryan LU, there is considerable overlap between OGMAs and old forest stands that exhibit a moderate to high potential for habitation sites, these are located along lower slope or valley bottom areas predominantly in Ryan River. Several OGMAs also overlap with forest stands showing moderate to high potential for CMTs. There is no overlap between OGMAs and potential travel routes.

## **7.0 OGMA Methodology**

### **7.1 Existing Planning Processes**

Each LU contains varying amounts of mature forested habitat provided by existing processes (e.g. some LUs have spotted owl Special Resource Management Zones, some have parks) 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.

An important part of the OGMA planning exercise was to ensure that these separate processes complemented each other. For example, 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 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 OGMA's may help facilitate deer movement in addition to benefiting biodiversity. Using this approach with stand level biodiversity measures will increase the likelihood of sustaining ecosystems and viable wildlife populations well distributed across their natural range.

## **7.2 Assessment and Review**

OGMA's 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 OGMA's throughout the LU was also a selection criterion. In general, opportunities to recruit larger patches to provide for forest interior habitat conditions were favoured over smaller patches. In this search, an effort was extended to minimize the impact on the timber supply by combining areas in the non-contributing (parks, inoperable) with areas within the timber harvesting land base. In addition, a significant number of smaller remnant patches containing age class 9 were delineated in conformance with the *Landscape Unit Planning Guidebook* (LUPG). A specific rationale for the selection of each OGMA is shown in Appendix 1.

In the Ryan Landscape Unit there was sufficient old forest (250+ years) in three of four BEC variant to meet OGMA targets. The exception being the CWHds1 where it was necessary to designate younger aged mature stands (i.e. mostly age 141-250 years, with some age 101-140 years) as recruitment OGMA's. Where possible, mature stands that had old forest attributes (e.g. snags, multi-layered canopy) or high resource values (e.g. deer winter range) were chosen as recruitment OGMA's.

## **7.3 Boundary Mapping**

OGMA boundaries used natural features wherever possible to ensure they could be located on the ground. OGMA's were also delineated to include complete forest stands (forest cover polygons) wherever possible to reduce operational uncertainty and increase ease of OGMA mapping. OGMA's were mapped using a 1:20000 scale TRIM base, which forms the legal standard for measurement. Procedures for operating within OGMA's 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 OGMA's. 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 OGMA for priority biodiversity provisions an attempt was made to mitigate the short and long-term impacts on timber supply. For example, OGMA were delineated first in the non-contributing forest land base (approximately 93% of OGMA were located in the land not contributing to THLB). Since representation must be at the variant level, the non-contributing land base could not always satisfy old forest requirements. Where this occurred, portions of the timber harvesting land base from most constrained to least constrained were assessed and included as OGMA (approximately 7% of OGMA were located in the THLB). Generally, more THLB was required in lower elevation variants due to a longer disturbance history and lesser amounts of non-contributing forest land.

OGMA were chosen in the oldest available age class first, however, old forest stands that were approved or proposed for harvesting on Forest Development Plans were excluded from candidate OGMA 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 OGMA Analysis by Landscape Unit

### 8.1 Ryan Landscape Unit

The Ryan LU was ranked as a Low Biodiversity Emphasis Option (BEO) 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 in each variant and from which Crown forest category (i.e. Non Contributing-NC; Timber Harvesting Land Base)<sup>5</sup>. 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 OGMA.

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<sup>5</sup> 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 requirements, Ryan Landscape Unit.**

BEC Variant	Full OGMA Target	Established OGMA	OGMAs in Non-Contributing (NC)				OGMAs in Partial Contributing (PC)**		OGMAs in Contributing (C)	
			Non - Park		Park		Ha	%	Ha	%
	Ha	Ha	Ha	%	Ha	%	Ha	%	Ha	%
<b>CWH ds1</b>	279	257.6*	140.6	54.7	7.9	3.1	48.8	18.9	60.4	23.3
<b>CWH ms1</b>	672	666.3*	536.2	80.5	0		78.7	11.8	51.3	7.7
<b>MHmm2</b>	1,010	1012.7	1010.2	99.8	0		0		2.5	0.2
<b>Total</b>	<b>1,961</b>	<b>1936.6</b>	<b>1687.0</b>	<b>87.1</b>	<b>7.9</b>	<b>0.4</b>	<b>127.6</b>	<b>6.6</b>	<b>114.2</b>	<b>5.9</b>

\* the total OGMA hectares in the CWHds1 and CWHms1 will be brought to target upon completion of the Deer Winter Range management plan.

\*\*19 ha of the total 128 ha in PC are part of the THLB. The remaining 109 ha are considered NC.

Note: Differences in totals are due to rounding.

CWHds1: Coastal Western Hemlock, dry subarctic, southern variant. NDT 2

CWHms1: Coastal Western Hemlock, moist subarctic, southern variant. NDT 2

MHmm2: Mountain Hemlock, moist maritime, leeward variant. NDT 1

## 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 required WTR percentage by BEC subzone is described in Table A of the *Legal Objectives*. Retention percents 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 3 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 are legally established within the framework of the FPC and as such 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 – Ryan LU

Appendix 2 Acronyms

Appendix 3 Public Consultation Summary

**APPENDIX 1: OGMA SUMMARY AND RATIONALE – Ryan LU**

OGMA #	BEC VARIANT	CONTRIB. CLASS	OGMA AREA	THLB AREA	COMMENTS	FDP	WILDLIFE
5	CWH ds 1	N	2.8	0.0	Steep, southeast aspect		Partial overlap with GWR
5	CWH ms 1	N	26.2	0.0	Steep, southeast aspect		Partial overlap with GWR
6	CWH ms 1	N	10.5	0.0			GWR
6	MH mm 2	N	19.5	0.0			GWR
7	CWH ds 1	N	4.4	0.0	Adjacent to Ryan River.		
8	CWH ds 1	C	5.7	5.7	Adjacent to Ryan River		
9	CWH ds 1	N	2.5	0.0	Adjacent to Ryan River.		
9	CWH ms 1	N	13.3	0.0	Adjacent to Ryan River.		
11	CWH ms 1	N	2.5	0.0	Steep southeast aspect.		GWR
11	MH mm2	N	6.4	0.0	Steep southeast aspect.		GWR
12	CWH ms 1	N	21.3	0.0	Mid elevation southwest aspect.		Partial overlap with GWR
12	CWH ms 1	P	10.7	1.1	Mid elevation southwest aspect.		Partial overlap with GWR
12	MH mm 2	N	22.6	0.0	Mid elevation southwest aspect.		Partial overlap with GWR
14	CWH ms 1	N	6.1	0.0	South aspect. Steep.		
14	MH mm 2	N	23.7	0.0	South aspect. Steep.		
15	CWH ms 1	N	1.2	0.0	Between slide tracks. South aspect.		
15	MH mm 2	N	15.9	0.0	Between slide tracks. South aspect.		
18	MH mm2	N	32.6	0.0	Large patch mid-upper elevation.		Partial overlap with GWR
19	CWH ms 1	N	9.1	0.0	Steep, narrow patch.		GWR
19	MH mm 2	N	5.3	0.0	Steep, narrow patch.		GWR
20	CWH ms 1	N	6.8	0.0	Steep southeast aspect.		Partial overlap with GWR
20	MH mm 2	N	11.3	0.0	Steep southeast aspect.		Partial overlap with GWR
22	CWH ms 1	N	15.3	0.0	North side of Ryan River. Recruitment.		
23	CWH ms 1	N	13.5	0.0	Mid slope. Steep.		Partial overlap with GWR
23	MH mm 2	N	9.6	0.0	Mid slope. Steep.		Partial overlap with GWR
25	MH mm 2	N	8.4	0.0	Mid-upper slope.		

OGMA #	BEC VARIANT	CONTRIB. CLASS	OGMA AREA	THLB AREA	COMMENTS	FDP	WILDLIFE
26	MH mm 2	N	12.4	0.0	Mid to upper slop adjacent to slide track.		
27	CWH ms 1	N	0.3	0.0	Large patch south aspect.		
27	MH mm 2	N	38.3	0.0	Large patch south aspect.		
28	MH mm 2	N	37.5	0.0	Large patch north side of Ryan River		
29	MH mm 2	N	24.2	0.0	North side of Ryan adj to large wetland.		
30	MH mm 2	N	6.9	0.0	North side of Ryan adj to slide tracks.		
32	MH mm 2	N	40.1	0.0	Large patch. Slide track netted out.		
33	CWH ms 1	N	5.3	0.0	Adjacent to Ryan River.		
40	MH mm 2	N	3.2	0.0	"Island" in brush patch.		
41	MH mm 2	N	5.4	0.0	Adjacent to large slide track and brush.		
42	MH mm 2	N	14.7	0.0	Adjacent to slide track and brush.		
45	CWH ms 1	N	2.6	0.0	Narrow patch north side of Ryan River.		
46	CWH ms 1	N	21.0	0.0	North side of Ryan River		
50	MH mm 2	N	9.3	0.0	Mid-upper slope. East aspect.		
53	CWH ms 1	P	20.5	2.0	South side of Ryan River.		
62	CWH ms 1	C	2.5	2.5	Small patch north side Ryan River.		
63	CWH ms 1	C	2.3	2.3	Inside oxbow on Ryan River.		
64	CWH ms 1	C	5.8	5.8	North side of Ryan River.		
65	CWH ms 1	N	2.8	0.0	South side of Ryan River.		
68	At unp	N	0.5	0.0	One of a cluster of patches in Ryan trib.		
68	MH mm 2	N	18.3	0.0	One of a cluster of patches in Ryan trib		
72	MH mm 2	N	10.2	0.0	Mid-slope east aspect. Petersen Crk.		GWR
73	MH mm 2	N	16.9	0.0	Mid-slope east aspect. Petersen Crk.		GWR
76	CWH ms 1	N	57.6	0.0	Large valley bottom patch. Petersen Crk.		
76	MH mm 2	N	83.9	0.0	Large valley bottom patch. Petersen Crk		
78	MH mm 2	N	11.1	0.0	North side Petersen Creek.		
79	MH mm 2	N	32.1	0.0	West aspect in cluster of patches.		

OGMA #	BEC VARIANT	CONTRIB. CLASS	OGMA AREA	THLB AREA	COMMENTS	FDP	WILDLIFE
80	MH mm 2	N	30.9	0.0	Northeast aspect in cluster of patches.		
82	MH mm 2	N	10.4	0.0	East aspect in cluster of patches.		
85	MH mm 2	N	17.3	0.0	Mid-upper elevation. West aspect.		
87	MH mm 2	N	65.6	0.0	Large patch northwest aspect.		
89	CWH ms 1	N	13.9	0.0	Large patch straddling Wasp Creek.		
89	MH mm 2	N	72.6	0.0	Large patch straddling Wasp Creek.		
90	MH mm 2	N	5.1	0.0	East aspect mid-slope.		
91	MH mm 2	N	8.9	0.0	East aspect mid-slope.		
92	MH mm 2	N	31.5	0.0	West aspect. Head of Wasp Creek.		
97	CWH ds 1	P	20.2	2.0	Large patch north side of Ryan River.		
99	CWH ds 1	P	4.6	0.5	South side of Ryan across from #97.		
102	CWH ds 1	N	1.1	0.0	Ac/Cw type. South side Ryan River		
102	CWH ds 1	C	4.8	4.8	Ac/Cw type. South side Ryan River.		
103	CWH ds 1	P	7.0	0.7	Ac/Cw Type across Ryan from #102.		
103	CWH ds 1	C	5.5	5.5	Ac/Cw Type across Ryan from #102.		
103	CWH ds 1	N	2.9	0.0	Ac/Cw Type across Ryan from #102.		
104	CWH ds 1	N	3.0	0.0	Small patch on south side of Ryan River.		
105	CWH ds 1	N	5.5	0.0	Ac/Cw type adj. To private land.		
106	CWH ms 1	N	5.9	0.0	Upslope of old burn		
106	MH mm 2	N	48.7	0.0	Upslope of old burn.		
108	CWH ds 1	C	9.9	9.9	Partial recruitment. Partial TL.		
108	CWH ds 1	N	6.0	0.0	Partial recruitment. Partial TL.		
108	CWH ms 1	N	6.6	0.0	Partial recruitment. Partial TL.		
108	CWH ms 1	C	0.1	0.1	Partial recruitment. Partial TL.		
109	CWH ms 1	N	15.6	0.0	Gullied steep terrain.		
109	MH mm 2	N	12.0	0.0	Gullied steep terrain.		
110	CWH ds 1	N	10.0	0.0	TL. Patch in existing block.		



OGMA #	BEC VARIANT	CONTRIB. CLASS	OGMA AREA	THLB AREA	COMMENTS	FDP	WILDLIFE
110	CWH ds 1	P	0.1	0.0	TL. Patch in existing block.		
110	CWH ms 1	N	4.2	0.0	TL. Patch in existing block.		
111	CWH ds 1	N	8.6	0.0	On knoll adjacent to private land.		
112	MH mm 2	N	8.8	0.0	Narrow patch both sides of creek.		
115	MH mm 2	N	11.1	0.0	Upper drainage		
117	CWH ms 1	N	10.2	0.0	Upslope of rocky open ground.		
117	MH mm 2	N	12.0	0.0	Upslope of rocky open ground.		
118	CWH ds 1	N	2.9	0.0	Partial TL. Adjacent to private land.		
118	CWH ds 1	P	6.1	0.6	Partial TL. Adjacent to private land.		
118	CWH ds 1	C	8.9	8.9	Partial TL. Adjacent to private land.		
119	CWH ds 1	N	35.9	0.0	Partial TL.		
119	CWH ms 1	N	15.4	0.0	Partial TL		
120	CWH ds 1	N	5.9	0.0	Midslope eastern aspect.		
121	MH mm 2	N	28.2	0.0	Near Miller Lake. South aspect.		
122	MH mm 2	N	23.2	0.0	North aspect near Miller Lake.		
123	MH mm 2	N	17.7	0.0	Encompasses two parallel creeks.		
125	CWH ms 1	N	39.1	0.0	Steep east aspect. Rock netted out.		
127	CWH ds 1	N	17.2	0.0	Steep slope above Ryan River.		
127	CWH ms 1	N	17.1	0.0	Steep slope above Ryan River.		
129	CWH ds 1	C	19.6	19.6	Straddles Miller Creek.		
129	CWH ms 1	C	4.5	4.5	Straddles Miller Creek.		
130	MH mm 2	N	11.7	0.0	Between two slide tracks.		
136	CWH ds 1	P	7.3	0.7	Steep. Between two rock bluffs.		
136	CWH ms 1	P	4.1	0.4	Steep. Between two rock bluffs		
138	CWH ds 1	P	1.4	0.6	Rocky. East aspect.		
138	CWH ds 1	N	17.5	0.0	Rocky. East aspect.		
138	CWH ds 1	C	3.3	3.3	Rocky. East aspect.		

OGMA #	BEC VARIANT	CONTRIB. CLASS	OGMA AREA	THLB AREA	COMMENTS	FDP	WILDLIFE
139	CWH ds 1	N	9.4	0.0	Steep east aspect.		Partial overlap with Spotted Owl SRMZ
139	CWH ms 1	N	2.6	0.0	Steep east aspect.		
140	CWH ds 1	N	2.6	0.0	South side Pemberton Creek. Steep.		Spotted Owl SRMZ
140	CWH ds 1	C	2.1	2.1	South side Pemberton Creek. Steep.		Spotted Owl SRMZ.
140	CWH ms 1	N	11.8	0.0	South side Pemberton Creek. Steep.		Spotted Owl SRMZ.
142	CWH ms 1	N	15.6	0.0	Straddles Pemberton Creek.		
142	CWH ms 1	P	18.2	7.3	Straddles Pemberton Creek.		
144	CWH ms 1	N	49.9	0.0	Large patch. Mid elevation		
144	MH mm 2	N	32.1	0.0	Large patch. Mid elevation.		
145	MH mm 2	N	30.4	0.0	Flat valley bottom to mid slope.		
145	MH mm 2	C	2.5	2.5	Flat valley bottom to mid slope.		
146	MH mm 2	N	10.0	0.0	Within gully system.		
148	CWH ms 1	N	38.1	0.0	Partial TL.		Spotted Owl SRMZ. GWR.
148	MH mm 2	N	1.1	0.0	Partial TL.		Spotted Owl SRMZ. GWR.
151	CWH ds 1	N	7.9	0.0	Between Highway and Green River.		Spotted Owl SRMZ.
153	CWH ds 1	P	0.4	0.0	Mid slope. Southeast aspect.		GWR. Spotted Owl SRMZ.
153	CWH ms 1	N	15.4	0.0	Mid slope. Southeast aspect.		GWR.
153	CWH ms 1	C	9.2	9.2	Mid slope. Southeast aspect.		GWR. Partial Spotted Owl SRMZ
153	CWH ms 1	P	4.3	0.4	Mid slope. Southeast aspect.		GWR. Partial Spotted Owl SRMZ
154	CWH ds 1	P	0.1	0.0	Mid-upper slopes.		GWR
154	CWH ms 1	P	4.7	0.5	Mid-upper slopes.		GWR
154	CWH ms 1	N	26.1	0.0	Mid-upper slopes		GWR
155	CWH ds 1	P	1.5	0.2	South aspect.		GWR
155	CWH ds 1	N	2.5	0.0	South aspect.		GWR
155	CWH ms 1	P	2.4	0.2	South aspect.		GWR
157	CWH ms 1	C	12.5	12.5	Mid-upper elevation		GWR
157	CWH ms 1	P	4.5	0.4	Mid-upper elevation		GWR

OGMA #	BEC VARIANT	CONTRIB. CLASS	OGMA AREA	THLB AREA	COMMENTS	FDP	WILDLIFE
157	CWH ms 1	N	1.9	0.0	Mid-upper elevation		GWR
158	CWH ms 1	P	9.4	0.9	Mid-upper elevation. South aspect.		GWR
158	CWH ms 1	C	14.4	14.4	Mid-upper elevation. South aspect.		GWR
158	CWH ms 1	N	2.2	0.0	Mid-upper elevation. South aspect.		GWR
159	CWH ms 1	N	15.3	0.0	Steep northeast aspect.		
160	CWH ms 1	N	13.9	0.0	South side Ryan River.		
160	MH mm 2	N	0.5	0.0	South side Ryan River.		

Note: Differences in totals are due to rounding

## **Appendix 2: Acronyms**

AAC	Allowable Annual Cut
BEC	Biogeoclimatic Ecosystem Classification
BEO	Biodiversity Emphasis Option
BCTS	British Columbia Timber Sales
C	Contributing
CMT	Culturally Modified Tree
DDM	Delegated Decision Maker
FPC	Forest Practices Code of British Columbia Act
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**

This Landscape Unit was advertised for public review and comment for 60 days from April 1, 2004 to June 1, 2004.

Prior to the public consultation period, MSRM met with the local forest licensees and consulted with First Nations. Meetings or conversations were also held with Ministry of Forests and Ministry of Water, Land and Air Protection during the development of the LU plan. Mineral tenure holders were advised of OGMA placement.

No comments were received during the advertising period.