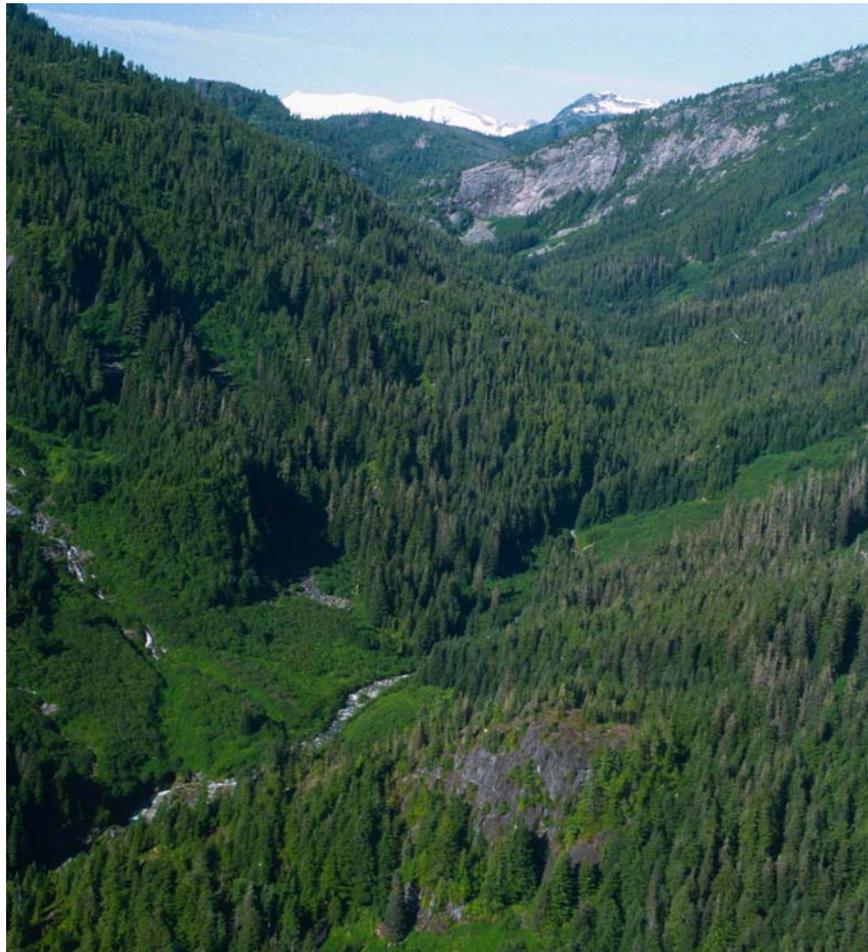


Sustainable Resource Management Plan

Biodiversity Chapter for Billygoat 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 Billygoat 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’*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 Squamish Forest District has completed draft LU boundaries and assigned 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 Billygoat LU was rated as an Intermediate 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 International Forest Products, the BC Timber Sales Program, Western Forest Products Ltd., and Halray Logging Ltd. 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://srmapps.gov.bc.ca/apps/eswp/>

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

2.1 Biophysical Description

The Billygoat LU is situated on the lee side of Fingerpost Ridge and the west side of Lillooet Lake. It's located south-east of Pemberton and north of the Tuwasus Creek watershed and approximately two-thirds of the landscape unit is within Garibaldi Park. The Landscape Unit covers a total area of 60933 ha and encompasses several watersheds flowing into the west side of Lillooet Lake. Larger named watersheds within the LU include Gravell Creek, Ure Creek, Kakila Creek and Billygoat Creek; others are smaller and unnamed. Several glaciers also occur within the LU.

Of the total area, 23611 ha (39%) are within the Crown forested land base, and 9026 ha of Crown forest are within the Timber Harvesting Land Base (THLB). The remaining 37323 ha (61%) are non-forested or non-Crown (rock, alpine tundra, water, private land etc.) and have been excluded from any OGMA contributions and calculations.

The Billygoat LU lies within the Pacific Ranges Ecoregion, and entirely within the Eastern Pacific Ranges ecoregion. Climatic conditions are best characterized by elevation. At lower elevations summers are warm and dry, while winters are cool and relatively moist with moderate snowfall. Mid elevations are characterized by moist, cool winters with relatively heavy snowfall and cool but relatively dry summers. High elevation climate is characterized by long, moist, cold winters with high snowfall and short, cool, moist summers.

There are five Biogeoclimatic (BEC) subzones or variants within the Billygoat Landscape Unit, which fall within four natural disturbance types (NDTs)³. The Mountain Hemlock leeward moist maritime variant (MHmm2) lies within NDT 1, while the Coastal Western Hemlock southern dry subarctic (CWHds1) and the Coastal Western Hemlock southern moist subarctic variants (CWHms1) fall within NDT2.

³ NDT1 encompasses those ecosystems with rare stand-initiating events. NDT2 includes ecosystems with infrequent stand initiating events. NDT4 includes ecosystems with frequent stand-maintaining fires. 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 fourth forested BEC subzone is the Interior Douglas-fir wet warm subzone (IDFww) which is situated in NDT4. The landscape unit has extensive non-forested areas in NDT5 (Alpine Tundra).

At lower elevations, within NDT1 and 4, the Billygoat LU has sustained substantial levels of disturbance. Forested stands on lower elevation productive sites (typically on slopes with low to moderate gradient) have been disturbed by past timber harvesting. The relatively low levels of old seral forest remaining within the lower elevation BEC variants reflects this disturbance history.

2.2 Summary of Land Status

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

Table 1. Land Status of the Billygoat Landscape Unit.

Code	Ownership class	Billygoat LU (Hectares)	Percent of total area
40	Private and Crown grants	27.9	0.0%
52	Indian reserve	97.6	0.2%
61	Crown UREP	80.2	0.1%
62	Crown contributing	21930.8	36.0%
63	Parks	38334.4	62.9%
69	Rec. sites and reserves	6.6	0.0%
70	Timber license	455.9	0.8%
	Total Area	60933.4	100.0%

Table 2. Land status using Crown forest land base classifications

BEC Unit	Area (ha)	Crown Forested Land Base*			Excluded Land Base
		C	PC	NC	
CWH ds1	5690	2382	684	1703	921
CWH ms1	13470	2784	1336	6665	2685
IDF ww	3167	1323	277	131	1437
MH mm2	14177	787	143	5095	8152
AT p	24430	3	0	300	24128
TOTAL	60933	7279	2440	13894	37323

* 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 OGMA within existing tenures. As for tenures administered by MOF, the management intent is to avoid placement of OGMA 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 Billygoat plan area, volume based tenures exist and have been made available to licensees such as the BC Timber Sales Program (administered by MOF), International Forest Products Ltd., Western Forest Products Ltd. and Halray Logging Ltd. The OGMA 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 23 mineral tenures within the landscape unit, all are located outside the park and predominantly near Lillooet Lake. The selection of OGMA 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 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. 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 Billygoat LU include: grizzly bear, spotted owl, mule deer, mountain goat, fish and some species at risk that are considered “Identified Wildlife”⁴. Many other species occur including forest birds,

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

raptors, small mammals, amphibians and furbearers but their habitat requirements are generally managed within habitat provisions provided for primary species. For example, habitat for spotted owls in the Billygoat LU is maintained within Special Resource Management Zones (SRMZ's) which covers approximately 6,507 ha of gross forested area. Approximately 70% (4602 ha) of the gross forested area is suitable owl habitat (>100 years old forest). This owl habitat would support other forest dependent species.

The Billygoat LU is also an important area for mule deer and mountain goats. Forested winter range habitat for both these species has been identified by MWLAP. All or a portion of the winter habitat areas are being considered for legal establishment as Ungulate Winter Range (UWR) under the FPC according to management plans developed by MWLAP (the Mountain Goat plan is approved). Some of the UWR overlaps with Spotted Owl SRMZ and some of each species' habitats have been captured in OGMA. The habitat maintained for ungulates would also benefit other forest dependent species.

Grizzly bears in the Billygoat LU are part of the threatened Garibaldi-Pitt 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 a Recovery Plan to protect additional grizzly bear habitat in the Billygoat 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.

Further, most of Ure and Billygoat Creeks and their major tributaries support 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.

4.2 Timber Resources

The presence of a substantial 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 Billygoat LU are best described by elevation. Low elevation forests are dominated by Douglas-fir with lesser amounts of western hemlock and western red cedar. Mid elevation 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 sub-alpine fir, Douglas-fir, and cedar being less common. Based on forest cover information, Table 3 shows the age

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.

composition of forests in the Billygoat LU. Most of the old forests are located in Garibaldi Park.

Table 3. Age distribution of forests within the Billygoat Landscape Unit.

Age	% of Forested Landbase within Provincial Forest
0-60	8.4%
61-140	45.6%
141-250	12.4%
251+	33.6%

Approximately 51% of the forested sites are poor growing sites and 40% are medium growing sites. Good sites constitute 2% 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

Only four small parcels of private land occur within the Billygoat LU. One is located at the north end of the LU south of Pemberton and adjacent to the Lillooet River; an OGMA has been placed adjacent to this private land. The other three parcels are Indian Reserves and are situated adjacent to Lillooet Lake.

4.4 Water

There are no Community Watersheds within the Billygoat Landscape Unit.

4.5 Recreation

Garibaldi Park makes up a large portion of the Billygoat Landscape Unit. Backcountry and heli-skiing recreational activities occur during the winter months, albeit to a lesser degree than areas nearer to population centres. Winter recreational activity outside the park is normally restricted by seasonal road deactivation and snow accumulation, although snowmobiling could occur on road systems or alpine areas.

In snow-free conditions, recreational hunting in the Billygoat LU is an annual activity enjoyed by many outdoor enthusiasts; most hunters would target black bears or deer. Stream angling opportunities are limited since stream resident fish are quite small, however Lillooet Lake is commonly used for recreational boating. 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 occur.

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

4.6 Mineral Resource Values

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. MEM has rated the metallic mineral potential of this area as moderate to moderately high. This ranking is 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. The aggregate potential for Billygoat LU has not been rated.

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 are higher level plan objectives. In part of the Billygoat 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 Billygoat 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 Billygoat LU is located within the traditional territory of the In-Shuck-Ch First Nation, which is represented by the Skatin, Samahquam and Douglas First Nations. The Lil'wat Nation (Mt. Currie) traditional territory also extends into the north end of the landscape unit.

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 Billygoat LU, there is considerable overlap between OGMAs and old forest stands that exhibit a moderate to high potential for habitation sites, these are located on lower slope or valley bottom areas along Billygoat and Ure Creek, and Lillooet Lake. Several OGMAs also overlap with forest

stands showing moderate to high potential for CMTs. The maps do not indicate any potential travel routes within the Landscape Unit.

7.0 OGMA Methodology

7.1 Existing Planning Processes

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.

An important part of the OGMA planning exercise was to ensure that these separate processes complemented each other. For example, OGMAs, where practical, were placed to create larger habitat patches in the vicinity of known spotted owl activity centres. In other cases, 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 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. 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 timber supply by combining areas in the non-contributing (parks, ecological reserves) with areas within 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). A specific rationale for the selection of each OGMA is shown in Appendix 1.

In the Billygoat Landscape Unit there was sufficient old forest (250+ years) in three of the four BEC variants to meet the majority of the OGMA targets. The exception being

the CWHds1 and IDFww 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. Where possible, mature stands that had old forest attributes (e.g. snags, multi-layered canopy) or high resource values (e.g. spotted owl, deer winter range) were chosen as recruitment OGMA.

7.3 Boundary Mapping

OGMA boundaries used natural features, such as creeks, wherever possible to ensure they could be located on the ground. OGMA were also delineated to include complete forest stands (forest cover polygons) wherever possible to reduce operational uncertainty and increase ease of OGMA mapping. OGMA were mapped using a 1:20000 scale TRIM base, which forms the legal standard for measurement. Procedures for operating within OGMA 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. 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 84% of OGMA are within the NC land base). 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. Generally, more THLB was required in lower elevation variants (e.g. IDFww) 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 (FDP) were generally 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. It should be noted that on one occasion a proposed Interfor cutblock was captured in OGMA (as agreed by Interfor), this was due to its high resource values and spatial importance. To reduce impacts in another area, Interfor identified approximately 50 ha of OGMA (with MWLAP, during 2003), more than half of which would also function as Deer Winter Range.

8.0 OGMA Analysis by Landscape Unit

8.1 Billygoat Landscape Unit

The Billygoat LU was ranked as an Intermediate biodiversity emphasis option through the biodiversity value ranking process completed earlier (see the *Vancouver Forest Region Landscape Unit Planning Strategy*, 1999). This Intermediate 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)⁵. 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.

Table 4. Old growth management area (OGMA) requirements, Billygoat Landscape Unit.

BEC Variant ¹	OGMA Target	Established OGMAs	OGMAs in Non-Contributing (NC)				OGMAs in Partial Contributing (PC)*		OGMAs in Contributing (C)	
			Park		Non-Park		Ha	%	Ha	%
	Ha	Ha	Ha	%	Ha	%	Ha	%	Ha	%
CWH ds1	429	441.3	140.7	32	77.4	18	160.3	36	62.9	14
CWH ms1	971	975.6	680.3	70	118.2	12	123.5	13	53.6	6
IDF ww	225	226.4	0	0	45.1	20	76.2	34	105.1	46
MHmm2	1145	1,152.9	861.3	75	272.0	24	9.6	0.1	10.0	1
Total	2770	2796.2	1682.3	60	512.8	18	369.6	14	231.6	8

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

IDFww: Interior Douglas-fir, wet warm subzone. NDT 4

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

*220 ha of the total 370 ha in PC are part of the THLB. The remaining 150 ha are considered NC.

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

⁵ 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.

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 – Billygoat LU

Appendix 2 – Acronyms

Appendix 3 – Public Consultation Summary

APPENDIX 1: OGMA SUMMARY AND RATIONALE – Billygoat LU

OGMA #	BEC VARIANT	CONTRIB. CLASS	OGMA AREA	THLB AREA	COMMENTS	FDP	WILDLIFE
2	MH mm2	N	42.6	0	Top end of Gravell Crk		
5	CWH ds1	P	9.4	1.6	Steep gully. Adjacent to private land.		
5	CWH ds1	C	0.4	0.4	Steep gully. Adjacent to private land.		
7	MH mm2	N	2.9	0.0	Shown as ATp but is forested. Large patch on ridge. Variable aspects.		Partial GWR
7	MH mm2	N	68.9	0.0	Large patch on ridge. Variable aspects.		Partial GWR
8	CWH ms1	N	2.0	0.0	Below talus slope & between 2 lrg slides.		Adjacent to GWR
8	MH mm2	N	7.0	0.0	Below talus slope & between 2 lrg slides.		Adjacent to GWR
9	CWHms1	N	4.4	0.0	North aspect. Tributary to Ure Crk, Garibaldi Park		Partial GWR
9	MH mm2	N	32.3	0.0	North aspect. Tributary to Ure Crk, Garibaldi Park		Partial GWR
10	CWH ms1	N	4.8	0.0	Small patch adjacent to Ure Crk. Garibaldi Park		
10	MH mm2	N	0.1	0.0	Small patch adjacent to Ure Crk. Garibaldi Park		
11	CWH ms1	N	9.4	0.0	Mid slope south of Ure Crk. Garibaldi Park		
11	MH mm2	N	8.2	0.0	Mid slope south of Ure Crk. Garibaldi Park		
12	CWH ms1	N	3.3	0.0	Mid slope south of Ure Crk. Garibaldi Park		
12	MH mm2	N	13.1	0.0	Mid slope south of Ure Crk. Garibaldi Park		
13	CWH ms1	N	38.6	0.0	South side Ure Crk. Valley to mid-slope. Garibaldi Park		
13	MH mm2	N	21.6	0.0	South side Ure Crk. Valley to mid-slope. Garibaldi Park		
14	CWH ms1	N	92.6	0.0	Inside and adj. to Garibaldi park bdy. South side Ure Crk.		
14	MH mm2	N	29.0	0.0	Inside and adj. to Garibaldi park bdy. South side Ure Crk.		
15	MH mm 2	N	87.2	0.0	Straddles tributary south of Ure Crk. Garibaldi Park		
16	MH mm2	N	2.0	0.0	Shown as ATp but is forested. Straddles park bdy and trib S. of Ure Crk		
16	MH mm2	N	18.9	0.0	Straddles park bdy and trib S. of Ure Crk		

OGMA #	BEC VARIANT	CONTRIB. CLASS	OGMA AREA	THLB AREA	COMMENTS	FDP	WILDLIFE
17	MH mm2	N	19.3	0.0	In bowl below talus slope.		
18	CWH ds 1	P	5.0	5.0			LTOH
18	CWH ms 1	P	2.3	2.3			LTOH
19	CWH ms1	N	31.4	0.0	South side of incised creek.		LTOH
19	CWH ms1	P	13.8	13.8	South side of incised creek.		LTOH
19	CWH ds1	N	11.8	0.0	South side of incised creek.		LTOH
19	CWH ds1	P	87.1	57.8	South side of incised creek.		LTOH
19	CWH ds1	C	2.1	2.1	South side of incised creek.		LTOH
21	CWH ms1	N	0.8	0.0	Southeast aspect. Mid-upper slopes.		LTOH
21	MH mm2	N	8.5	0.0	Southeast aspect. Mid-upper slopes.		LTOH
22	CWH ms1	N	1.6	0.0	Eastern aspect nr. confluence of two crks.		LTOH
22	MH mm2	N	6.5	0.0	Eastern aspect nr. confluence of two crks.		LTOH
23	MH mm2	N	0.3	0.0	Shown as ATp but is forested. Headwaters of S&M Creek.		
23	CWH ms1	N	0.7	0.0	Headwaters of S&M Creek.		
23	MH mm2	N	13.5	0.0	Headwaters of S&M Creek.		
24	MH mm2	N	3.6	0.0	Small patch adj. To 23		
25	CWH ds1	N	6.5	0.0	Adjacent to Lillooet Lake		DWR
25	CWH ds1	N	0.9	0.0	Shown as X on map but is forested, adjacent to Lillooet Lake		DWR
25	IDF ww	N	11.7	0.0	Adjacent to Lillooet Lake		DWR
25	IDF ww	N	2.7	0.0	Shown as X on map but is forested		DWR
27	CWH ds1	P	4.9	2.3	Straddles gully. Steep Adj to Lillooet Lke.	Partial overlap with Halray Cat "I" Block	LTOH
27	CWH ds1	N	5.1	0.0	Straddles gully. Steep Adj to Lillooet Lke.	Partial overlap with Halray Cat "I" Block	LTOH
27	CWH ds1	N	11.2	0.0	Shown as X on map but is forested	Partial overlap with Halray Cat "I" Block	LTOH
27	CWH ms1	P	3.1	3.1	Straddles gully. Steep. Adj to Lillooet Lke.	Partial overlap with Halray Cat "I" Block	LTOH
27	IDF ww	N	0.1	0.0	Straddles gully. Steep. Adj to Lillooet Lke.	Partial overlap with Halray Cat "I" Block	LTOH
27	IDF ww	P	8.9	0.9	Straddles gully. Steep. Adj to Lillooet Lke.	Partial overlap with Halray Cat "I" Block	LTOH
27	IDF ww	N	5.2	0.0	Shown as X on map but is forested	Partial overlap with Halray Cat "I" Block	LTOH

OGMA #	BEC VARIANT	CONTRIB. CLASS	OGMA AREA	THLB AREA	COMMENTS	FDP	WILDLIFE
28	CWH ds1	N	4.2	0.0	Shown as X on map but is forested, midslope, eastern aspect, within gully.		LTOH/DWR
28	CWH ds1	P	5.9	5.9	Midslope, eastern aspect, within gully.		LTOH/DWR
28	CWH ms1	P	48.5	44.7	Midslope, eastern aspect, within gully.		LTOH/DWR
28	CWH ms1	N	4.0	0.0	Shown as X on map but is forested, midslope, eastern aspect, within gully.		LTOH/DWR
28	MH mm2	P	9.7	9.7	Midslope, eastern aspect, within gully.		LTOH/DWR
29	MH mm2	N	4.5	0.0	Shown as ATp but is forested. In bowl below Moat Peak		
29	MH mm2	N	47.5	0.0	In bowl below Moat Peak		
30	CWH ds1	C	8.1	8.1	Midslope.		
30	CWH ds1	N	4.1	0.0	Midslope.		
30	IDF ww	N	0.8	0.0	Midslope.		
31	IDF ww	N	1.7	0.0	Shown as X on map but is forested,	Adj to Halray approved Cat "A" block	
31	IDF ww	P	3.2	0.3	Near Lillooet Lake. Road netted out.	Adj to Halray approved Cat "A" block	
31	IDF ww	C	25.3	25.3	Near Lillooet Lake. Road netted out.	Adj to Halray approved Cat "A" block	
32	IDF ww	C	5.3	5.3			
32	IDF ww	N	0.5	0.0	Shown as X on map but is forested		
33	CWH ms1	N	6.4	0.0	Isolated patch mid-upper slopes.		
34	CWH ms1	N	5.5	0.0	Small patch south aspect upper slope.		GWR
35	IDF ww	C	2.4	2.4	Small patch near Lillooet Lake.		
36	CWH ds1	P	14.0	1.4	Lower slopes, eastern aspect.		LTOH/DWR/GWR
36	CWH ms1	P	0.3	0.3	Lower slopes, eastern aspect.		LTOH/DWR/GWR
36	IDF ww	P	10.1	1.0	Lower slopes, eastern aspect.		LTOH/DWR/GWR
36	IDF ww	N	2.2	0.0	Shown as X on map but is forested, lower slopes, eastern aspect.		LTOH/DWR/GWR
37	CWH ds1	P	4.3	1.8	Deer Winter Range		DWR/GWR
37	CWH ds1	N	2.1	0.0	Deer Winter Range		DWR/GWR
37	IDF ww	P	16.3	7.7	Deer Winter Range		DWR/GWR
37	IDF ww	N	5.4	0.0	Deer Winter Range		DWR/GWR

OGMA #	BEC VARIANT	CONTRIB. CLASS	OGMA AREA	THLB AREA	COMMENTS	FDP	WILDLIFE
38	IDF ww	P	8.6	8.6		Adj to Halray Prop. Category A block	
39	CWH ds1	P	4.5	4.5	Straddles tributary of Kakila Creek		LTOH
39	CWH ms1	C	1.3	1.3	Straddles tributary of Kakila Creek		LTOH
39	CWH ms1	P	24.7	24.7	Straddles tributary of Kakila Creek		LTOH
43	MH mm2	N	0.3	0.0	In park, shown as ATp & X but is forested.		GWR
43	CWH ms1	N	0.5	0.0	Straddles park bdy between drainages.		GWR
43	MH mm2	N	14.1	0.0	In park, shown as X but is forested.		GWR
43	MH mm2	N	9.1	0.0	Straddles park bdy between drainages.		GWR
45	MH mm2	N	2.3	0.0	Shown as ATp but is forested. Mid-upper slopes SW aspect. Garibaldi Park		GWR/LTOH
45	CWH ms1	N	4.4	0.0	Mid-upper slopes SW aspect. Garibaldi Park		GWR/LTOH
45	MH mm2	N	17.1	0.0	Mid-upper slopes SW aspect. Garibaldi Park.		GWR/LTOH
46	CWH ms1	N	39.0	0.0	Confluence of two crks. Variable aspects. Garibaldi Park		LTOH
46	MH mm2	N	94.5	0.0	Confluence of two crks. Variable aspects. Garibaldi Park		LTOH
47	CWH ms1	N	53.1	0.0	Steep northwest aspect. Garibaldi Park		LTOH
48	MH mm2	N	1.1	0.0	Shown as ATp but is forested. Eastern aspect. Trib. Of Kakila Crk. Garibaldi Park		LTOH
48	CWH ms1	N	0.1	0.0	Eastern aspect. Trib. Of Kakila Crk. Garibaldi Park		LTOH
48	MH mm2	N	29.0	0.0	Eastern aspect. Trib. Of Kakila Crk. Garibaldi Park		LTOH
49	MH mm2	N	4.3	0.0	Shown as ATp but is forested. North aspect. Mid-upper slope. Garibaldi Park		LTOH
49	CWH ms1	N	2.1	0.0	North aspect. Mid-upper slope. Garibaldi Park		LTOH
49	MH mm2	N	18.9	0.0	North aspect. Mid-upper slope.		LTOH
50	CWH ms1	N	31.2	0.0	North aspect. Mid-slope. Garibaldi Park		LTOH
50	MH mm2	N	2.0	0.0	North aspect. Mid-slope. Garibaldi Park		LTOH
51	CWH ms1	N	6.1	0.0	Straddles park bdy. Mid-upper slopes		LTOH
51	MH mm2	N	5.6	0.0	Straddles park bdy. Mid-upper slopes		LTOH

OGMA #	BEC VARIANT	CONTRIB. CLASS	OGMA AREA	THLB AREA	COMMENTS	FDP	WILDLIFE
51	MH mm2	N	1.1	0.0	In park, shown as X but is forested. Mid-upper slopes		LTOH
52	MH mm2	N	16.9	0.0	Straddles park bdy. Upper slopes.		
52	MH mm2	C	2.8	2.8	Straddles park bdy. Upper slopes.		
53	CWH ds1	C	2.3	2.3	Small patch between rd and old logging		
53	IDF ww	C	3.7	3.7	Small patch between rd and old logging		
54	CWH ds1	C	1.8	2.0	Lower mid slope. Eastern aspect.		
54	CWH ds1	N	1.1	0.0	Lower mid slope. Eastern aspect.		
54	IDF ww	C	3.4	3.8	Lower mid slope. Eastern aspect.		
54	IDF ww	N	3.5	0.0	Lower mid slope. Eastern aspect.		
55	MH mm2	N	1.4	0.0	Shown as ATp but is forested. Straddles park bdy between 2 slide tracks		
55	CWH ms1	N	10.5	0.0	Straddles park bdy between 2 slide tracks		
55	MH mm2	N	9.0	0.0	Straddles park bdy between 2 slide tracks		
56	CWH ms1	N	23.6	0.0	Northeast aspect near head of drainage. Garibaldi Park		
56	MH mm2	N	28.8	0.0	Northeast aspect near head of drainage. Garibaldi Park		
57	CWH ds1	P	0.8	0.1	Small patch between rock and old logging	Overlaps with MOF Cat "I" block	
57	IDF ww	P	3.2	0.3	Small patch between rock and old logging	Overlaps with MOF Cat "I" block	
58	CWH ds1	P	0.7	0.1	Adjacent to Lillooet Lake. Rocky.		
58	IDF ww	P	25.9	2.6	Adjacent to Lillooet Lake. Rocky.		
58	IDF ww	C	22.9	22.9	Adjacent to Lillooet Lake. Rocky.		
59	CWH ds1	C	6.0	6.0	Straddles lower end of Billygoat Creek.	Partial overlap with MOF Cat "I" block	
59	IDF ww	C	21.5	21.5	Straddles lower end of Billygoat Creek.	Partial overlap with MOF Cat "I" block	
59	IDF ww	N	2.3	0.0	Straddles lower end of Billygoat Creek.	Partial overlap with MOF Cat "I" block	
60	CWH ds1	N	13.6	0.0	Park. North side Billygoat Crk.		Adjacent to GWR
62	MH mm2	N	52.6	0.0	Valley bottom to upper slope. Garibaldi Park		
63	MH mm2	N	1.5	0.0	Shown as ATp but is forested. 1 of 3 patches on north side Chaos Crk. Garibaldi Park		

OGMA #	BEC VARIANT	CONTRIB. CLASS	OGMA AREA	THLB AREA	COMMENTS	FDP	WILDLIFE
63	MH mm2	N	6.0	0.0	1 of 3 patches on north side Chaos Crk. Garibaldi Park		
64	MH mm2	N	6.6	0.0	1 of 3 patches on north side Chaos Crk. Garibaldi Park		
65	CWH ms1	N	7.3	0.0	1 of 3 patches on north side Chaos Crk. Garibaldi Park		
65	MH mm2	N	7.6	0.0	1 of 3 patches on north side Chaos Crk. Garibaldi Park		
66	MH mm2	N	1.5	0.0	Shown as ATp but is forested. Near headwaters of Chaos Crk. Garibaldi Park		
66	CWH ms1	N	14.4	0.0	Near headwaters of Chaos Crk. Garibaldi Park		
66	MH mm2	N	43.5	0.0	Near headwaters of Chaos Crk. Garibaldi Park		
68	CWH ms1	N	65.4	0.0	Eastern aspect. W. side Chaos Crk Garibaldi Park		
68	MH mm2	N	14.4	0.0	Eastern aspect. W. side Chaos Crk Garibaldi Park		
69	CWH ms1	N	3.9	0.0	Mid-upper slopes. East aspect. Garibaldi Park		
69	MH mm2	N	68.9	0.0	Mid-upper slopes. East aspect. Garibaldi Park		
70	CWH ds1	N	127.2	0.0	Large patch, straddles Billygoat Crk. Garibaldi Park	Change in size due to openings in forest	
70	CWH ms1	N	15.7	0.0	Large patch, straddles Billygoat Crk. Garibaldi Park	Change in size due to openings in forest	
72	CWH ms1	N	2.1	0.0	Southwest aspect. Mid-upper slopes. Garibaldi Park		
72	MH mm2	N	14.8	0.0	Southwest aspect. Mid-upper slopes. Garibaldi Park		
73	MH mm2	N	25.1	0.0	Southwest aspect. Mid-upper slopes. Garibaldi Park		
74	CWH ms1	N	8.9	0.0	Southern aspect. Valley to mid-slope. Garibaldi Park		
74	MH mm2	N	19.6	0.0	Southern aspect. Valley to mid-slope. Garibaldi Park		
76	CWH ms1	N	15.7	0.0	West side Nannygoat Crk. Garibaldi Park		
76	MH mm2	N	13.7	0.0	West side Nannygoat Crk. Garibaldi Park		
77	CWH ms1	N	5.5	0.0	East side Nannygoat Crk Garibaldi Park		
77	MH mm2	N	28.1	0.0	East side Nannygoat Crk Garibaldi Park		

OGMA #	BEC VARIANT	CONTRIB. CLASS	OGMA AREA	THLB AREA	COMMENTS	FDP	WILDLIFE
78	MH mm2	N	0.7	0.0	Shown as ATp but is forested. East side Nannygoat Creek. Garibaldi Park		
78	CWH ms1	N	16.8	0.0	East side Nannygoat Creek. Garibaldi Park		
78	MH mm2	N	32.1	0.0	East side Nannygoat Creek. Garibaldi Park		
79	CWH ms1	N	50.2	0.0	South side Billygoat Crk. Garibaldi Park		
80	CWH ms1	N	19.6	0.0	NW aspect on trib. South of Billygoat Crk. Garibaldi Park		
80	MH mm2	N	24.4	0.0	NW aspect on trib. South of Billygoat Crk. Garibaldi Park		
81	CWH ms1	N	20.7	0.0	Steep NW aspect. Garibaldi Park		
81	MH mm2	N	13.2	0.0	Steep NW aspect. Garibaldi Park		
82	CWH ms1	N	125.6	0.0	Large patch on trib. S of Billygoat Crk. Garibaldi Park		
82	MH mm2	N	44.5	0.0	Large patch on trib. S of Billygoat Crk. Garibaldi Park		
84	CWH ms1	N	29.1	0.0	Steep slope. North aspect.		
84	MH mm2	N	0.5	0.0	Steep slope. North aspect.		
85	IDF ww	C	5.2	5.2	Small patch above old logging.		
86	IDF ww	C	6.2	6.2	Small patch above old logging.		
89	CWH ds1	C	13.8	13.8	Straddles creek		
89	CWH ds1	N	8.5	0.0	Straddles creek		
89	CWH ds1	P	0.6	0.1	Straddles creek		
89	IDF ww	C	1.1	1.1	Straddles creek		
90	CWH ms1	C	29.2	29.2	Straddles creek		
91	MH mm2	N	0.3	0.0	Shown as ATp but is forested. Straddles park bdy. East aspect.		
91	MH mm2	N	9.0	0.0	Straddles park bdy. East aspect.		
91	MH mm2	C	7.1	7.1	Straddles park bdy. East aspect.		
94	CWH ds1	C	2.6	2.6	Gully along creek		
94	CWH ds1	N	5.5	0.0	Gully along creek		
94	CWH ms1	N	3.2		Gully along creek		

OGMA #	BEC VARIANT	CONTRIB. CLASS	OGMA AREA	THLB AREA	COMMENTS	FDP	WILDLIFE
94	IDF ww	C	4.0	4.0	Gully along creek		
95	IDF ww	C	3.9	3.9	Narrow band near lake above road.		
96	MH mm2	N	6.3	0.0	Gravell Creek-northwest aspect.		
97	CWH ms1	N	14.9	0.0	Steep slope-north aspect adj to #84		
97	MH mm2	N	5.3	0.0	Steep slope-north aspect adj to #84		
98	IDF ww	N	9.1	0.0		Overlaps with MOF Cat "I" block	
99	CWH ds1	P	17.3	6.9	Important spatial patch		
99	CWH ms1	N	3.5	0.0	Important spatial patch		
99	CWH ms1	P	27.0	10.8	Important spatial patch		
100	CWH ds 1	C	6.7	6.7		Agreed to by licensee	DWR
100	CWH ms 1	C	23.1	23.1		Agreed to by licensee	DWR
100	CWH ms 1	P	4.0	1.6		Agreed to by licensee	DWR
101	CWH ds 1	C	19.3	19.3		Agreed to by licensee	Partial DWR
101	CWH ds 1	N	16.6	0.0		Agreed to by licensee	Partial DWR
101	CWH ds 1	P	5.0	0.5		Agreed to by licensee	Partial DWR

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

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.

During the review and comment period, the Ministry of Forests informed MSRM that there were overlaps between some OGMAs and logged or Category A cutblocks. Consistent with LU planning policy, changes to OGMA locations were made to remove conflicts.