Squamish Forest District
Landscape Unit Planning

Indian Landscape Unit Plan

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Table of Contents

List of Tables

List of Appendices

1.0 Introduction

This report provides background information used during the preparation of the Indian Landscape Unit plan and legal objectives. A description of the landscape unit, discussion on significant resource values, and an OGMA summary and rationale are provided. A summary of public comments received during the 60 day public review and comment period is included in Appendix II.

Landscape Unit (LU) Planning is being undertaken in high priority areas of the province, and is an important component of the *Forest Practices Code* (FPC) which allows legal establishment of objectives to address landscape level biodiversity values. 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. Over 150 taxa of known mammals, birds, reptiles, and amphibians and over 600 vascular plants are listed for legal designation as threatened or endangered in British Columbia. 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).

Implementation of LU Planning is intended to help maintain biodiversity values. Retention of biodiversity is important for wildlife and can also provide important benefits to ecosystem management, protection of water quality and preservation of other natural resources.

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 this district. Approval of this plan will allow legal establishment of the Indian LU boundaries, BEO and legal objectives.

Through a ranking process (see Appendix I) the Indian LU was rated as a Low BEO. Current government direction 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 Ministry of Sustainable Resource Management (MSRM), in co-operation with Ministry of Forests (MOF) and Ministry of Water, Land and Air Protection (MWLAP) staff. Input was also solicited from forest licensees and First Nations.

Refer to the attached map dated August 6, 2002 for the location of OGMAs and complementary old growth representation outside of the Provincial forest (i.e. within protected areas). This includes some areas of forests less than age class 9 (i.e. <250 years of age) that can be considered recruitment areas for old seral representation. Throughout this report, the term OGMA is used to refer to all areas of old seral representation or recruitment, whether within the Provincial forest or protected areas; however, the map differentiates between these two land bases. Refer to Appendix IV for a summary of OGMA attributes by forest type and biogeoclimatic ecosystem classification variant.

[1] Definition of biodiversity is from page 2 of the Forest Practices Code *Biodiversity Guidebook* (September, 1995).

2.0 Landscape Unit 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.

The Indian LU received a Low BEO through the biodiversity value ranking and BEO assignment processes completed earlier (see Appendix I). Table 1 lists the percentages of the LUs productive forest area by natural disturbance type (NDT) required for old seral representation. The target figures listed in Table 1 are derived from Appendix 2 in the *Landscape Unit Planning Guide* (LUPG). The percentages of cutblock area required for WTR for each BEC subzone are shown in Table A of the *Legal Objectives*.

Note: Objectives apply only to Provincial forest lands. Protected areas and other Crown forest lands outside of Provincial forest contribute old seral representation but the LU Objectives do not apply to these areas.

Table 1. Required Levels for Old Seral Representation

BEC Variant[1]	NDT[2]	LUPG Old Seral Representation Target[3]	
		%	ha
CWHvm1	**NDT 1**	>13	>594
CWHvm2	**NDT 1**	>13	>785
MHmm1	**NDT 1**	>19	>654

1 CWHvm1: Coastal Western Hemlock biogeoclimatic zone, submontane very wet maritime variant
CWHvm2: Coastal Western Hemlock biogeoclimatic zone, montane very wet maritime variant.
MHmm1: Mountain Hemlock biogeoclimatic zone, windward moist maritime variant.
2 NDT = Natural Disturbance Type. Refer to LUPG, Appendix 2.
3 % of total productive forest area within BEC variant, as per LUPG.

Old seral representation targets listed above have been met through the delineation of OGMAs throughout the Indian LU and complementary old growth representation within protected areas. Refer to the attached Indian LU map for the location of OGMAs, to Appendix IV for OGMA statistics and attributes, and to Table 2 for a breakdown of non-contributing (NC), constrained Timber Harvesting Land base (THLB) and unconstrained THLB components.

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

Table 2. Non-contributing, Constrained THLB and Unconstrained THLB Components of Indian LU OGMAs

BEC Variant	Total Old Seral Representation[1]	Non–Contributing[2] Area in OGMA				Constrained THLB[3] in OGMA		Unconstrained THLB in OGMA[4]	
	ha	park (ha)	other (ha)	Total (ha)	%	ha	%	ha	%
CWHvm1	**598.2**	220.2	313.3	533.5	89.2	0.3	0.1	64.3	10.7
CWHvm2	**786.9**	254.8	498.5	753.3	95.7	0.0	0.0	33.6	4.3
MHmm1	**655.4**	314.1	329.3	643.4	98.2	0.0	0.0	12.1	1.8
TOTALS	**2040.5**	**789.1**	**1141.1**	**1930.2**	**94.6**	**0.3**	**0.0**	**110.0**	**5.4**

Note: any differences in totals are due to rounding

1 This represents the actual amount established based on targets from Table 1.

2 **Non-Contributing Area in OGMA** = productive forest land that does not contribute to the AAC.

3 **Constrained THLB in OGMA** = Timber Harvesting Land Base that cannot fully contribute to the AAC due to site sensitivity or the need to manage for other resource values

4 **Unconstrained THLB in OGMA** = THLB area (productive forest land) that is available for harvesting

3.0 Landscape Unit Description

3.1 Biophysical Description

The Indian LU covers a total area of 22097 ha, encompassing both the Indian River watershed and the smaller Grand Creek watershed. These two watercourses flow into the northern end of Indian Arm, a long, deep fiord that extends north from Burrard Inlet. Of this total LU area, 14140 ha (64%) is within the Crown forest land base, and 6059 ha of Crown forest is within the THLB. The remaining 7957 ha (36%) are non-forested or non-Crown (rock, alpine tundra, water, private land) and have been excluded from any OGMA contributions and calculations.

A large portion of the productive Crown forest not included within THLB is located within two protected areas that overlap with the Indian River watershed. These are the Indian Arm Provincial Park at the southern end of the watershed, and Pinecone-Burke Provincial Park on the eastern side of the watershed.

The Indian LU lies within the Pacific Ranges Ecoregion, Southern Pacific Ranges ecosection. The LU is comprised of the following 4 BEC subzones/variants: Coastal Western Hemlock submontane very wet maritime (CWHvm1); Coastal Western Hemlock montane very wet maritime (CWHvm2); Mountain Hemlock windward moist maritime (MHmm1); and Alpine Tundra (ATp).

These 4 BEC subzones/variants represent two different Natural Disturbance Types, with CWHvm1, CWHvm2 and MHmm1 in NDT 1 (rare stand initiating events) and ATp in NDT 5 (alpine tundra and subalpine parkland).

Forest ecosystems in NDT 1 were influenced historically by rare stand-initiating events and were generally uneven-aged or multi-storied uneven aged, with regeneration occurring in gaps created by the death of individual trees or small patches of trees. Approximately 92% of the gross area of the Indian LU is within NDT 1. Ecosystems in NDT 5 (remaining 8%) are not considered

productive forest since they occur above or immediately below the alpine treeline and are characterised by short and harsh growing seasons.

At lower elevations, within NDT 1, the Indian LU has sustained significant levels of disturbance. Forested stands on lower elevation productive sites (typically on slopes with low to moderate gradients within the CWH variants) have been disturbed by past timber harvesting, land clearing and other factors. The relatively low levels of old seral forest representation within these variants reflects this disturbance history. Despite this long harvest history, the Indian LU can meet the majority of the old growth representation targets within productive forests in the non-contributing (NC) land base.

3.2 Significant Resource Values

The LU supports a wide range of natural resource values and features, and a diversity of social and cultural values and influences. A variety of ownership and tenure types are present, including: small amounts of private land; Indian reserve; Crown forest (International Forest Products Limited and BC Timber Sales chart) and protected areas. Although access to the LU is restricted to logging roads, boat or helicopter, the LU is relatively close to large urban settlements (e.g. Squamish, West Vancouver, North Vancouver). As a result, public and commercial recreation pressures are steadily increasing. These factors all increase the complexity of resource management within the Indian LU.

Fish, Wildlife and Biodiversity: Nineteen wildlife species of specific management concern are known or suspected to be present within the Indian LU (Table 3). These include RED-listed, BLUE-listed, regionally important, and/or other species at risk called Identified Wildlife under the Forest Practice Code.

Table 3. Wildlife Species of Specific Management Concern.

Species	Status[1]	Additional Comments	Likelihood of Presence[2]
Rubber Boa	Yellow-listed	Identified Wildlife	High
Tailed frog	BLUE-listed	Identified Wildlife	High
American bittern	BLUE-listed	Identified Wildlife	High
Great blue heron	BLUE-listed	---	Confirmed present
Green heron	BLUE-listed	---	High
Harlequin duck	Yellow-listed	Regionally important	Confirmed present
Marbled murrelet	BLUE-listed	Identified Wildlife	High
Spotted owl	RED-listed	---	Low to Moderate
Bald eagle	Yellow-listed	Regionally important	Confirmed present
Peregrine falcon	RED- and BLUE-listed subspecies	---	High
Northern goshawk	RED- and BLUE-listed subspecies	Identified Wildlife	High
Keen's long-eared myotis	RED-listed	Identified Wildlife	High
Townsend's big-eared bat	RED-listed	Identified Wildlife	High
Pacific water shrew	RED-listed	Identified Wildlife	Low to Moderate
Trowbridge shrew	BLUE-listed	Identified Wildlife	High
Mountain goat	Yellow-listed	Regionally important	Confirmed present

Black-tailed deer	Yellow-listed	Regionally important	Confirmed present
Grizzly bear	BLUE-listed	Identified Wildlife	High
Wolverine	Yellow-listed	Regionally important	High

1 Status from the British Columbia Conservation Data Centre (CDC). Yellow-listed species is any indigenous species or subspecies (taxa) which is not at risk in British Columbia. The CDC tracks some Yellow listed taxa which are vulnerable during times of seasonal concentration (e.g. breeding colonies). BLUE-listed species includes any indigenous species or subspecies considered to be Vulnerable in British Columbia. Vulnerable taxa are of special concern because of characteristics that make them particularly sensitive to human activities or natural events. Blue-listed taxa are at risk, but are not Extirpated, Endangered or Threatened. RED-listed species is any indigenous species or subspecies considered to be Extirpated, Endangered, or Threatened in British Columbia. Extirpated taxa no longer exist in the wild in British Columbia, but do occur elsewhere. Endangered taxa are facing imminent extirpation or extinction. Threatened taxa are likely to become endangered if limiting factors are not reversed. Red-listed taxa include those that have been, or are being, evaluated for these designations.

2 Professional judgement regarding likelihood of presence, based on species distribution and habitat requirements.

Of these 19 wildlife species, 5 species were given notable consideration during the OGMA delineation process. This included mountain goats, black-tailed deer, marbled murrelets, grizzly bears and bald eagles.

Mountain goat winter range habitat has been previously identified by the Ministry of Environment, Lands and Parks (MELP, now called MWLAP) throughout the Indian LU, based upon inventory work conducted in the 1990s. Legal designation of these areas as Ungulate Winter Range (UWR) is currently being pursued under Section 69 of the FPC Operational Planning Regulation. UWR habitat polygons mapped at 1:20000 scale were referenced during OGMA delineation, to maximise overlap of OGMAs with constrained areas. As well, 1:20000 scale mapping for deer winter range (1997 draft "*Deer Habitat Management Plan for the Soo TSA*") was referenced during OGMA placement.

The maintenance of marbled murrelet (MAMU) nesting habitat is another management consideration for the Indian LU. The marbled murrelet, a small coastal seabird, is RED-listed in British Columbia and designated as THREATENED in Canada by the Committee on the Status of Endangered Wildlife in Canada. The main threat to this species is considered to be the loss of old growth nesting habitat. While there are no spatially identified marbled murrelet nesting habitat areas within the LU, marbled murrelets are known to utilise marine foraging habitats within flight distance of the Indian River watershed. MAMU nesting activity is thus expected within suitable old seral forest habitats in this LU. Suitable MAMU nesting habitat consists primarily of age class 8 and 9 forests (141 – 250+ years) with tree heights greater than 20 meters and at elevations up to 1400 m. As outlined in the Identified Wildlife Management Strategy (IWMS), the marbled murrelet is to be managed through placement of OGMAs within suitable marbled murrelet nesting habitat. This approach was attempted in the Indian LU, by situating OGMAs within potential nesting habitat, and through establishing larger patches as OGMAs. However, it must be noted that other LU Planning requirements (i.e. to place OGMAs in the NC land base, mitigate timber impacts) precluded successful implementation of effective management options for this species.

Grizzly bears occur in low densities within the Indian LU. This area is within the threatened Garibaldi-Pitt grizzly bear population unit (GBPU), one of 65 GBPUs in the province delineated by MELP under the British Columbia Grizzly Bear Conservation Strategy. A recovery plan for this threatened population has not yet been written. Grizzly bears are also an Identified Wildlife species and provisions exist under the IWMS to protect some critical foraging or security habitat

within Wildlife Habitat Areas (WHAs). While critical grizzly bear habitats have not been specifically identified in this LU, OGMA placement near avalanche slide-tracks and other potentially valuable habitat features is expected to benefit grizzly bears and other species, and maintain options for future WHA designation. Important habitats for other Identified Wildlife species, such as northern goshawk and tailed frog, may receive habitat protection within WHAs in the future.

From November through February, over-wintering concentrations of bald eagles are known to occur within the lower Indian River watershed, in association with stream reaches that are accessible to migratory salmonid species. Formal inventory efforts have not been undertaken to determine the most valuable daytime perching/feeding or night-time communal roosting habitats. As a result, OGMA delineation did not take direct guidance from spatially defined habitat information for this regionally important species. Instead, the general association of bald eagles with riparian and adjacent upland forests was used for guidance when placing OGMAs.

In addition to these wildlife species, the Indian River also supports a notable resident and migratory salmonid population. Salmonid species associated with this watercourse include: rainbow trout (including the migratory form – steelhead), cutthroat trout, Dolly Varden char, bull trout, pink salmon, coho salmon, chum salmon, and chinook salmon. Bull trout are also an Identified Wildlife species.

Protected Areas: There are two protected areas within the landscape unit: Indian Arm Provincial Park on the southern end of the watershed and Pinecone-Burke Provincial Park on the eastern side of the watershed. OGMAs were placed in the NC to maximise biodiversity objectives, whether or not these NC areas overlapped with protected areas in an attempt to select the most favourable old forest stands for OGMAs and biodiversity objectives.

Timber Resources: Commercially valuable tree species in the Indian LU include Western red cedar, Douglas-fir and western hemlock at the lower to mid elevations and mountain hemlock and sub-alpine fir mostly in higher elevation areas. Small components of Engelmann spruce and lodgepole pine also exist.

Of the total 6059 ha of THLB, almost 87% is 80 years old or less (immature). Forests ranging from 81 to 250 years old make up about 5% of the THLB (mature), and old forest (>250 years old) occupy about 8% of the THLB area. Continued access to commercially valuable timber, including future second growth, is a significant concern.

The Indian LU is within the Soo Timber Supply Area (TSA). Two forest licensees operate in the Indian LU. International Forest Products Limited has forest licence tenure on the west side of the LU, with several Timber Licences dispersed throughout the remaining area. The other licensee is the BC Timber Sales (BCTS) on the east side of the Indian River watershed. Timber sales issued by BCTS are sold to registered small business operators. Logging road access to the Indian LU is through the Stawamus River community watershed. In accordance with the Stawamus-Mashiter Integrated Watershed Management Plan there are some general restrictions on industrial use of this logging road to minimise the risk to water quality within the Stawamus River watershed. This includes a general prohibition of log hauling through the community watershed. As a result, raw logs are typically transported via log boom on Indian Arm, from a small log dump located near the south-eastern corner of the LU.

Community Water Systems: There are no designated Community Watersheds in the Indian LU.

First Nations: The Indian LU is located within areas covered by Statements of Intent for Treaty Negotiations by the following First Nations (listed alphabetically): Musqueam Nation; Squamish Nation; Sto:lo Nation; and Tsleil-Waututh Nation. A Tsleil-Waututh First Nation Indian Reserve is situated near the south-western corner of the LU, at the northern end of Indian Arm. There is evidence of traditional use in many areas along the Indian River and extending upland along trail systems. Culturally modified trees (CMTs) have also been previously identified in some areas.

In 1997, an Archaeological Overview Assessment model was developed by Millennia Research on behalf of MOF to indicate where archaeological sites are most likely located. This was done to minimise potential impacts by forestry operations on culturally important areas. The model was useful in predicting the potential location of CMT and habitation sites.

The maps produced from the model were reviewed to determine if potential CMT or habitation sites could be captured in OGMAs, especially in valley bottom areas (riparian) and mid slope locations. It should be noted, however, that the restriction of OGMAs to the NC land base resulted in a limited ability to achieve this overlap.

Private Land: Several large parcels of private land occur within the Indian LU, including a number previously owned by Weldwood Canada and recently acquired by the Tsleil-Waututh First Nation. The majority of these parcels are located south of the Hixon Creek confluence near the valley bottom. A few smaller parcels of private recreational properties are located on the east side of Indian Arm, within the south-eastern corner of the LU. This private land is an important consideration when establishing OGMAs. Some of the private land has been altered from its natural state and this change may influence the ecology of adjacent Crown forest lands. Where private and Crown land interfaced, these factors were considered during OGMA delineation.

Mining and Mineral Exploration: Subsurface resources (minerals, coal, oil, gas and geothermal) and aggregate resources are valuable to the province, but are difficult to characterise due to their hidden nature. Ministry of Energy and Mines (MEM) has rated the mineral potential of the LU as Low to Very High for industrial minerals (majority is Medium to High) and Medium to Very High for metallic minerals (majority is Medium to High). These MEM rankings are based on a qualitative analysis which takes into account the values 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.

In this LU there are 9 mineral showings (i.e. occurrences hosting minor in-situ mineralization), two prospects (i.e. occurrences documented as containing mineralization which warrants further exploration) and 12 mineral tenures. OGMA delineation was unable to take into specific account mineral potential, showings or prospects, and only one OGMA overlapped with a mineral tenure. It is understood that exploration and development activities are permitted in OGMAs but the preference is to proceed with exploration and development in a way that is sensitive to the old growth values of the OGMA. If this is not possible, then a replacement OGMA will be required.

Recreation: The extensive forest road network and marine water access, along with proximity to large urban settlements (e.g. Squamish, West Vancouver, North Vancouver) and the recreational resource values within this LU result in a wide variety of recreational opportunities

for the public. Recreational fishing is provided by a number of lakes, including Anne Lake, Little Anne Lake, Belknap Lake, Norton Lake and Young Lake, with access ranging from short hikes to direct vehicle access. Stream angling is provided in the mainstem Indian River, especially in lower reaches where migratory salmonids are seasonally present. Recreational hunting is an annual activity with hunters primarily pursuing black-tailed deer and black bears. Winter recreational activity is normally restricted by seasonal road gating and snow accumulations, though marine water access is available. All terrain vehicle, motorcycle and four wheel drive use of roads for recreation occurs to varying degrees. Trail hiking, berry and mushroom picking, wildlife viewing and sight-seeing also occur. There are no Forest Service Recreation Sites in the Indian LU and no development plans for the immediate future.

Commercial recreation is beginning to occur within the watershed, with guided angling being the primary focus at present.

4.0 Biodiversity Management Goals and Strategies

4.1 General Biodiversity Management Goals

Biodiversity management goals and strategies describe, in specific terms, the outcomes that legal LU Objectives are to achieve. They also describe the rationale for selection of OGMAs, some of the ecological features that OGMAs are to include, and some decisions made to balance management of all values present in the LU. While LU Objectives are legally binding, management goals and strategies are not. Goals and strategies must remain flexible to incorporate future direction and new methods to ensure continued compliance with the corresponding LU Objectives.

The biodiversity ranking process identified important biodiversity values within the Indian LU that must be managed for (see Appendix I). The delineation of OGMAs cannot be undertaken without recognition of these significant values because OGMA delineation is the most effective provision of the FPC LU planning initiative for managing biodiversity. The previous section (Section 3) describes the values considered in the LU planning process.

The development of biodiversity management goals and strategies is important not only for conservation of biodiversity, but also to allow development of strategies to mitigate short and long-term LU planning impacts on timber supply. For example, OGMA delineation was not guided strictly by age class or Allowable Annual Cut contributions, as this approach could result in including stands of marginal biodiversity value and significant timber supply impact. Individual forested polygons were assessed according to their specific attributes during the OGMA delineation process.

As per the LUPG, OGMAs were established in areas within the NC land base, according to the last Timber Supply Review (TSR). The only notable exception, where contributing land base was included within OGMAs, was the area immediately north of Young Lake. This area within BCTS chart was recently deferred from harvesting by MOF and should be considered a recent addition to the NC land base.
To pursue representation of old growth stands in each BEC variant, efforts were made to delineate OGMAs that included a diversity of stand types, by species composition and geographic/topographic locations. OGMAs were aggregated when possible, both within and

across BEC variants, to pursue connectivity and to create larger patch sizes with forest interior characteristics. Given the large size of the Indian LU, efforts had to be made to ensure OGMAs were distributed throughout the LU rather than concentrated in a particular drainage. This is consistent with the "coarse filter" approach of biodiversity management whereby representative old growth stands are protected to maintain ecosystem processes and specific wildlife habitat requirements that may be poorly understood. In addition, ensuring OGMA distribution throughout the LU helps ensure that potential operational impacts are shared by all licensees operating in the area.

Attempts were made to maximise OGMA overlap with high value wildlife habitats such as mountain goat or deer winter range, larger riparian areas and other unique or biologically valuable areas (e.g. wetlands and slide-tracks). Riparian reserve zones (RRZs) established in accordance with the FPC, will help maintain some fish and wildlife habitat values associated with riparian areas and adjacent riparian forests. OGMAs delineated within and adjacent to existing RRZs can be expected to build upon these fish and wildlife habitat values. Narrow or isolated riparian fringes were not included in OGMAs, as such areas are more appropriate for stand level management and do not meet the "coarse filter" approach outlined in the Biodiversity Guidebook.

In all cases, detailed air photo review was performed to confirm forest cover attributes and suitability of a given stand for OGMA. In addition, all OGMAs were reviewed by helicopter reconnaissance to confirm presence of old forest attributes. Numerous stands were also field checked to verify presence of desirable old seral characteristics.

4.2 Specific Biodiversity Management Goals and Strategies

4.2.1 Biodiversity Management Goals

1. Delineate old growth management areas in the non-contributing portion of the Provincial forest to maintain the full old seral representation targets for each BEC variant (CWHvm1, CWHvm2 and MHmm1), according to the following targets (from Table 1) and as per the attached map:
    a) CWHvm1 target of >13%, or at least 594 ha;
    b) CWHvm2 target of >13%, or at least 785 ha; and
    c) MHmm1 target of >19%, or at least 654 ha.

2. Maintain areas that are representative of natural ecosystem patterns and ecosystem mosaics.

3. Maintain a wide range of ecosystem types and species composition.

4. Include rare, unique or under-represented stand types within OGMAs where possible and when compatible with other biodiversity goals.

5. Aggregate OGMAs when possible, both within and across BEC variants, to implement additional biodiversity management provisions like connectivity and forest interior habitat.

6. Place OGMAs where site location and topographic features provide the highest wildlife habitat and biodiversity value, such as UWRs, stream confluences, adjacent to slide-tracks, wetlands and other features when suitable old growth is present.

7. Pursue overlap of OGMAs with potential marbled murrelet nesting habitats.

4.2.2 Biodiversity Management Strategies

A. Delineate OGMAs that include existing stands of old growth (250+ years old) or particularly high biodiversity value older mature stands (generally 150 to 250 years old) that will provide old growth attributes in as short a time frame as possible (Goals 1 and 2).

B. No harvesting activities, including salvage or single-tree harvesting, are to occur within OGMAs (Goal 1).

C. Include unique stands and habitat types within OGMAs (Goals 1, 2, 3 and 4).

D. Delineate OGMAs that are as large and contiguous as possible, while ensuring that they contain a wide range of sites and habitat types (Goals 2, 3, 4, 5, 6).

E. Establish OGMAs that are adjacent to biologically valuable non-forest habitats (e.g. wetlands and slide-tracks) (Goal 6).

F. Delineate OGMAs that include as much potentially suitable marbled murrelet nesting habitat as possible (Goal 7).

G. Retain veteran trees within harvesting areas to levels typical of densities found following natural disturbances as a focus of stand level biodiversity management, in accordance with the wildlife tree retention objective. Retention of dominants as veteran recruits is recommended where veterans are not present in the stand (Goal 2).

4.3 OGMA Boundary Mapping

OGMA boundaries were delineated to include complete forest stands (i.e. forest cover polygons) and followed natural features whenever possible to improve the ease of OGMA mapping and reduce operational uncertainty. 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.

4.4 Auditing Wildlife Tree Retention

The percent required for wildlife tree retention described in Table A of the *Legal Objectives* for the Indian Landscape Unit 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 for retention 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.

5.0 Mitigation of Timber Supply Impacts

The Indian LU plan has been developed to maximise the effectiveness of the FPC biodiversity management provisions while minimising impacts on the Soo TSA timber supply.

As mentioned previously, there are two main forest licensees with operations within the Indian LU. OGMAs were delineated based upon the biodiversity management goals and strategies with no specific effort to pursue even distribution of OGMAs between these licensees. Instead, LU planning in the Squamish Forest District is intended to minimise impacts to timber supply as a whole across the entire district. Of the total 2040.5 ha of OGMA established, 1932 ha come from the NC land base; and 110 ha are from the contributing land base. Licensees recommended the contributing areas due to constraints. Operability of these areas should be addressed during the next Timber Supply Review.

Specific measures adopted to minimise impacts of Indian LU planning to timber supply include the following:

1. All OGMAs were delineated within the NC land base or THLB areas that are considered part of the NC by licensees. For the purposes of this LU planning exercise and the goal of achieving old seral representation targets throughout the NC, NC within and outside of protected areas was viewed to be equal. The main goal was to distribute the OGMAs across the LU and select the most favourable stands for OGMAs/old seral representation to meet biodiversity objectives and spatial representation needs. Potential timber supply impacts may have been reduced by selecting from NC within protected areas first.

2. Further to point #1, an attempt was made to ensure that NC stands associated with protected areas, Environmentally Sensitive Areas, lower productivity sites, areas of difficult access and marginal economics were included within OGMAs where possible and when compatible with biodiversity objectives.

3. Suitable old growth stands within UWR habitats were included in OGMAs whenever feasible, to reduce overall timber supply impacts and maximise overlap between constrained areas.

4. Areas included in OGMAs were assessed according to potential marbled murrelet nesting habitat suitability, timber values and existence of road infrastructure for future harvest access. Stands at the periphery of habitat areas with a high degree of fragmentation were often not included in OGMAs due to their lowered habitat suitability and ease of industrial access.

5. During the LU planning process, consideration was made to ensure timber access was not precluded by OGMA delineation. Known access corridors were generally left out of OGMAs and OGMA boundaries were delineated to simplify adjacent management.

6. Approved year 2000 Forest Development Plans for both forest licensees and the 2001 amendment for International Forest Products Limited's forest license, were used during

OGMA delineation to avoid proposed or approved developments. Direct consultation with licensees also occurred.

7. OGMA boundaries used natural features wherever possible to ensure they could be located on the ground. OGMAs were delineated to include complete stands of timber wherever possible to reduce operational uncertainty, increase the ease of OGMA mapping, and maximise the "coarse filter" effectiveness of OGMAs for long-term biodiversity protection.

8. Where possible, OGMA placement avoided areas within the NC land base identified by licensees as potential future harvest opportunities (e.g. helicopter access). Establishing OGMAs in the NC may still have implications to future timber supply by reducing helicopter harvesting opportunities.

5.1 OGMA Amendment Procedures:

An MSRM Coast Region policy is being developed to give direction to proponents (forest tenure holders) when applying for amendments to OGMA legal objectives. Amendment procedures will 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.

Appendix I: Biodiversity Emphasis Option Ranking Criteria

The Indian LU received a Low BEO during the landscape unit ranking process completed earlier by the Squamish Forest District Landscape Unit Planning Team. The first set of criteria, to rank ecological values, was applied to determine an initial BEO ranking for the District's LUs. The LU with the highest ecological values score was ranked number one, the next highest, number two and so on. The timber values were scored next, with their resultant scores generally being used as tie-breakers for LUs with similar ecological scores. This approach was consistent with direction provided in the FPC *Higher Level Plans: Policy and Procedures* document.

Final determination regarding the BEO assignment, particularly when scores were close, was based upon discussions between MELP and MOF.

What follows is a series of Tables that summarize the ecological and timber scores with draft and final BEO assignments. Table Ia is a summary of general BEO ranking criteria, followed by the ecological scoring summary for the Indian LU (Table Ib). Table Ic summarizes the ecological ranking score for the entire forest district, while Table Id shows the draft BEOs based on ecological scores. Table Ie illustrates the timber value rating criteria, while Table If shows the timber score for the Indian LU, and Table Ig describes the timber score for all landscape units in the district. The final BEO assignment is shown in Table Ih.

1) Ecological Values Ranking Criteria

The ecological values ranking criteria was used to initially assess which of the Squamish Forest District's LUs required higher levels of biodiversity provisions.

Table Ia. Ecological Values Ranking Criteria for Squamish LUs

Ecological Values	Criteria	Criteria description	Value	Rank	Score
Ecosystem Representation	Representation in parks	By % of BEC variants	0.0 to 0.4% >0.4 to 0.8% >0.8 to 1.2% >1.2 to 1.6% >1.6 to 2.0% >2.0%	High Low	5 pts 4 pts 3 pts 2 pts 1 pt 0 pts
Ecosystem Complexity	Diversity of BEC variants	By # of different BEC variants	7 BEC variants 6 BEC variants 5 BEC variants 4 BEC variants 3 BEC variants	High Low	8 pts 6 pts 4 pts 2 pts 0 pts
	---	---	---	---	---
	Diversity of special habitat features	Professional judgement regarding diversity of special habitat features (estuaries, freshwater deltas floodplains; wetlands/lakes, slidetracks)	5/5 4/5 3/5 2/5 1/5 0/5	High Low	5 pts 4 pts 3 pts 2 pts 1 pt 0 pts

Table Ia contd

Fish/Wildlife Values	Fish/Wildlife values	Ranked based on points for species of special concern within the Squamish Forest District (anadromous salmonids, bull trout tailed frog, marbled murrelet, spotted owl, grizzly bear, moose and black-tailed deer)	score ≥ 10 score 7 to 9 score 4 to 6 score ≤ 3	High Low	10 pts 6 pts 2 pts 1 pt
Sensitivity to Development	Based on sensitivity of BEC variants --- Inherent level of protection from signif. human disturbance (i.e. urbanisation, agricultural use, recreational use, etc...)	Determine NDT type which is most prevalent (exclude NDT 5) --- Professional judgement	NDT 1 >60% NDT 1 30-60% NDT 1 <30% NDT2 predomin. --- Based on review and assessment by MELP staff	High Low --- High Low	2 pts 1 pts 0 pts 0 pts --- 3 pts 2 pt 1 pt 0 pts
Connectivity	Based on non-PAS connectivity --- Based on connectivity associated with PASs	Determine what proportion of the gross land area is mature/old (preliminary score) and then use professional judgement to derive a final score --- Determine what proportion of the gross land area is protected	>50% >40 to 50% >30 to 40% ≤30% --- >20% >10 to 20% >1 to 10% <1%	High Low --- High Low	3 pts 2 pts 1 pt 0 pts --- 3 pts 2 pts 1 pt 0 pts
Capability	Based on how easily seral stage targets can be met (exclude AT)	Determine how much old forest is currently present --- Determine how many BEC variants currently achieve old seral targets for high BEO --- Determine how much AC 8 is present (for recruitment and long-term capability)	>60% >40 to 60% >20 to 40% 0 to 20% --- >80% >70 to 80% >50 to 70% 0 to 50% --- >40% >20 to 40% 0% to 20%	High Low --- High Low --- High Medium Low	4 pts 3 pts 2 pts 1 pt --- 3 pts 2 pts 1 pt 0 pts --- 2 pts 1 pt 0 pts
Total Score					**48 pts**

Table Ib. Ecological Values Scoring Summary for Indian LU

Ecological Values	Criteria	Criteria description	Value	Score
Ecosystem Representation	Representation in parks	By % of BEC variants	1.13%	3 pts

Table Ib contd

Ecosystem Complexity	Diversity of BEC variants --- Diversity of special habitat features	By # of different BEC variants --- Professional judgement regarding diversity of special habitat features (estuaries, freshwater deltas floodplains; wetlands/lakes, slidetracks)	3 variants --- 3/5 special habitat features	0 pts --- 3 pts
Fish/Wildlife Values	Fish/Wildlife Values	Ranked based on points for species of special concern within the Squamish Forest District (anadromous salmonids, bull trout tailed frog, marbled murrelet, spotted owl, grizzly bear, moose and black-tailed deer)	initial score of 7/21	6 pts
Sensitivity to Development	Based on sensitivity of BEC variants --- Inherent level of protection from signif. human disturbance (i.e. urbanisation, agricultural use, recreational use, etc...)	Determine NDT type which is most prevalent (exclude NDT 5) --- Professional judgement	NDT 1 is 93.2% of gross land base --- no human habitation, no agricultural use and moderate to high level of recreational use	2 pts --- 1 pt
Connectivity	Based on non-PAS connectivity --- Based on connectivity associated with <u>PASs</u>	Determine what proportion of the gross land area is mature/old (preliminary score) and then use professional judgement to derive a final score --- Determine what proportion of the gross land area is protected	21.4% --- 21.86% of gross area is protected but harvesting has previously occurred in parks	0 pts --- 3 pt
Capability	Based on how easily seral stage targets can be met (exclude AT)	Determine how much old forest is currently present --- Determine how many BEC variants currently achieve old seral targets for high BEO --- Determine how much AC 8 is present (for recruitment and long-term capability)	48.1% of total productive forest is old growth --- 100% of the 3 variants can meet old seral targets --- 16.1% of age classes 1 thru 8 are age class 8	2 pts --- 3 pts --- 0 pts
Total Score				**23 pts**

Table Ic. Ecological Values Ranking for Original 21 Squamish Forest District LUs

LU	LU #	Total Score (x/48)	Ranking
Rogers	**301**	**23**	8th (tied with Indian and Upper Squamish)
Meager	**302**	**24**	7th (tied with Lower Elaho and Tuwasus)
Upper Elaho	**303**	**25**	6th (tied with Billygoat)
Lower Elaho	**304**	**24**	7th (tied with Meager and Tuwasus)
Upper Squamish	**305**	**23**	8th (tied with Rogers and Indian)
Ryan	**306**	**12**	11th
Lower Squamish	**307**	**28**	4th
Billygoat	**308**	**25**	6th (tied with Upper Elaho)
Mamquam	**309**	**20**	9th (tied with Soo and Whistler)
Tuwasus	**310**	**24**	7th (tied with Meager and Lower Elaho)
East Howe	**311**	**14**	10th
Indian	**312**	**23**	**8th (tied with Rogers and Upper Squamish)**
Soo	**313**	**20**	9th (tied with Mamquam and Whistler)
Whistler	**314**	**20**	9th (tied with Mamquam and Soo)
Callaghan	**315**	**9**	12th
Sloquet	**316**	**30**	2nd (tied with Gates)
Upper Lillooet	**317**	**27**	5th (tied with Lizzie)
Railroad	**318**	**29**	3rd
Birkenhead	**319**	**31**	1st
Gates	**320**	**30**	2nd (tied with Sloquet)
Lizzie	**321**	**27**	5th (tied with Upper Lillooet)

Table Id. Draft BEOs for Original 21 Squamish Forest District LUs Based on Ecological Values Ranking

BEO	LU	LU #	Ranking	% of Total THLB
High	**Gates**	**320**	2nd (tied with Sloquet)	**4.1**
High	**Sloquet**	**316**	2nd (tied with Gates)	**4.9**
High	**Birkenhead**	**319**	1st	**1.0 (1.0/3.4)**
				Total = 10.0
Intermediate	**Birkenhead**	**319**	1st	**2.4 (2.4/3.4)**
Intermediate	**Railroad**	**318**	3rd	**3.9**
Intermediate	**Lower Squamish**	**307**	4th	**2.3**
Intermediate	**Upper Lillooet**	**317**	5th (tied with Lizzie)	**6.1**
Intermediate	**Lizzie**	**321**	5th (tied with Upper Lillooet)	**3.8**
Intermediate	**Upper Elaho**	**303**	6th (tied with Billygoat)	**5.6**
Intermediate	**Billygoat**	**308**	6th (tied with Upper Elaho)	**3.8**
Intermediate	**Meager**	**302**	7th (tied with Lower Elaho and Tuwasus)	**3.1**
Intermediate	**Lower Elaho**	**304**	7th (tied with Meager and Tuwasus)	**5.0**
Intermediate	**Tuwasus**	**310**	7th (tied with Meager and Lower Elaho)	**1.9**
Intermediate	**Rogers**	**301**	8th (tied with Indian and Upper Squamish)	**6.3**
Intermediate	**Indian**	**312**	8th (tied with Rogers and Upper Squamish)	**3.9**
				Total = 48.1
Low	**Upper Squamish**	**305**	8th (tied with Rogers and Indian)	**12.7**
Low	**Whistler**	**314**	9th (tied with Mamquam and Soo)	**2.4**

Table Id contd

Low	**Mamquam**	**309**	9th (tied with Soo and Whistler)	**10.1**
Low	**Soo**	**313**	9th (tied with Mamquam and Whistler)	**5.5**
Low	**East Howe**	**311**	10th	**4.1**
Low	**Ryan**	**306**	11th	**3.4**
Low	**Callaghan**	**315**	12th	**3.6**
				Total = 41.8

2) Timber Values Rating Criteria

Timber values rating criteria were used to assess the relative timber values of the District's LUs and consider short and long-term contributions of each LU to the TSA in terms of value and timber volume.

Table Ie. Timber Values Rating Criteria for Squamish LUs

Timber Values	Criteria	Criteria description	Value/Comments	Rating
Productivity	Site Index	Proportion of THLB in LU with SI of ≥ 25 (higher proportion of better sites resulted in a higher rating)	>35% of THLB 25 to 35% of THLB <25% of THLB	High Moderate Low
Mature and harvestable Timber	Mature and harvestable timber	Proportion of mature and harvestable timber in LU (higher proportion of mature and harvestable timber resulted in a higher rating)	>50% ≥ 101 years 25 to 50% ≥ 101 years <25% ≥ 101 years	High Moderate Low
Operability	Operability	Proportion of age class 8 (141 to 250 years of age) and age class 9 (>250 years) in the productive land base that is considered operable (conventional operability data and professional judgement regarding extent to which new helicopter operability data will change operable land base)	Review of proportion of age classes 8 and 9 that are considered operable, with professional judgement applied to reach a final rating	High Moderate Low
Averaged rating	Site Index, Mature and Harvestable Timber and Conventional Operability	Averaged rating of the 1st 3 criteria	Averaged rating of the 1st 3 criteria, based a review of these ratings and professional judgement	High Moderate Low
Constraints	Constraints on harvesting	Amount of constraints to harvesting (e.g. visual quality, community watersheds, proximity to communities, recreation, high fish and wildlife values)	Professional judgement of the extent of constraints to harvesting	High Moderate Low
Overall Rating				Low to High*

* Note: Unlike the ecological values rating criteria, the rating of timber values did not follow a point scoring system. The first three values (productivity/mature and harvestable timber/operability) were utilised by MOF planning staff to develop an "averaged" rating of low, medium or high. When constraints were high, this averaged rating was reduced by 1 level (e.g. from high to medium).

Table If. Timber Values Rating Summary for Indian LU

Timber Values	Criteria	Criteria description	Value/Comments	Rating
Productivity	Site Index	Proportion of THLB in LU with SI of ≥ 25 (higher proportion of better sites resulted in a higher rating)	32.8% of THLB	Moderate
Mature and harvestable Timber	Mature and Harvestable Timber	Proportion of mature and harvestable timber in LU (higher proportion of mature and harvestable timber resulted in a higher rating)	21.4% of THLB	Low
Operability	Operability	Proportion of age class 8 (141 to 250 years of age) and age class 9 (>250 years) in the productive land base that is considered operable (conventional operability data and professional judgement regarding extent to which new helicopter operability data will change operable land base)	Review of proportion of age classes 8 and 9 that are considered operable, with professional judgement applied to reach a final rating	High
Averaged rating	Site Index, Mature and Harvestable Timber and Conventional Operability	Averaged rating of the 1st 3 criteria	Averaged rating of the 1st 3 criteria, based a review of these ratings and professional judgement	Moderate
Constraints	Constraints on harvesting	Amount of constraints to harvesting (e.g. visual quality, community watersheds, proximity to communities, recreation, high fish and wildlife values)	Professional judgement of the extent of constraints to harvesting (Indian LU: recreation and fisheries)	Low
Overall Rating				Moderate

Table Ig. Timber Values Rating for Original 21 Squamish Forest District LUs

LU	LU #	Overall Timber Values Rating
Rogers	**301**	**Moderate**
Meager	**302**	**Moderate**
Upper Elaho	**303**	**High**
Lower Elaho	**304**	**High**
Upper Squamish	**305**	**High**
Ryan	**306**	**Moderate**
Lower Squamish	**307**	**Moderate**
Billygoat	**308**	**Moderate**
Mamquam	**309**	**Moderate/High**
Tuwasus	**310**	**Low**
East Howe	**311**	**Low**
Indian	**312**	**Moderate**
Soo	**313**	**Moderate**
Whistler	**314**	**Low**
Callaghan	**315**	**Moderate**
Sloquet	**316**	**High**
Upper Lillooet	**317**	**Low**
Railroad	**318**	**Moderate**
Birkenhead	**319**	**Moderate**

Table Ig contd

Gates	**320**	**Low/Moderate**
Lizzie	**321**	**Low**

3) Final BEO Designation

Final BEO designations were based on initial consideration of the draft BEOs, which were derived from the original ecological ranking, and the timber values rating criteria. Ecological values rankings within 2 points of each other were assumed to have the same relative score and the timber values ranking was used to break any ties. Final BEO designation was based on discussions between MELP and MOF planning staff. In regards to the allocation of High, Intermediate and Low BEOs, an attempt was made to achieve a 10-45-45 percent distribution for High, Intermediate and Low BEOs respectively. The final distribution was 10% High, 46% Intermediate and 44% Low. It should be noted that THLB Area reported in Table Ih is derived from the RLUPS data base which used PAMAP, the THLB numbers used in the new data set used ArcInfo and are considered more accurate.

Table Ih. Final BEO for 20* Squamish Forest District LUs Based on Ecological and Timber Values

Final BEO	LU	LU #	Original Ecological Ranking	Draft BEO	Timber Values Rating	THLB Area (ha)	% of Total THLB**
High	**Birkenhead**	**319**	1st	High/Int.	Moderate	6,768.0	**4.19**
High	**Railroad**	**318**	3rd	Intermediate	Moderate	5,816.8	**3.60**
High	**Sloquet (portion)**	**316**	2nd	High	High	3,574.8	**2.21 (2.21/6.39)**
							Total = 10.00
Intermediate	**Gates**	**320**	2nd	High	Low/Mod.	7,330.7	**4.54**
Intermediate	**Sloquet (portion)**	**316**	2nd	High	High	6743.1	**4.18 (4.18/6.39)**
Intermediate	**Lower Squamish**	**307**	4th	Intermediate	Moderate	3,875.4	**2.40**
Intermediate	**Upper Lillooet**	**317**	5th	Intermediate	Low	2,305.5	**1.43**
Intermediate	**Lizzie**	**321**	5th	Intermediate	Low	7,004.1	**4.34**
Intermediate	**Billygoat**	**308**	6th	Intermediate	Moderate	8,386.7	**5.20**
Intermediate	**Elaho**	**303**	6th/7th	Intermediate	High	16,691.9	**10.34**
Intermediate	**Meager**	**302**	7th	Intermediate	Moderate	4,847.7	**3.00**
Intermediate	**Tuwasus**	**310**	7th	Intermediate	Low	4,793.6	**2.97**
Intermediate	**Rogers**	**301**	8th	Intermediate	Moderate	12,230.7	**7.58**
							Total = 45.98
Low	**Indian**	**312**	**8th**	Intermediate	Moderate	5,802.3	**3.59**
Low	**Upper Squamish**	**305**	8th	Low	High	19,922.2	**12.34**
Low	**Whistler**	**314**	9th	Low	Low	4,255.1	**2.64**
Low	**Mamquam**	**309**	9th	Low	Mod./High	14,420.3	**8.95**
Low	**Soo**	**313**	9th	Low	Moderate	8,454.7	**5.24**
Low	**East Howe**	**311**	10th	Low	Low	5,953.3	**3.69**
Low	**Ryan**	**306**	11th	Low	Moderate	5,462.7	**3.38**
Low	**Callaghan**	**315**	12th	Low	Moderate	6,761.7	**4.19**
							Total = 44.02

* Note: In conjunction with final BEO determinations and in response to concerns regarding timber impacts, the Upper Elaho and Lower Elaho LUs were merged into 1 landscape unit (Elaho LU). This reduced the total number of LUs within the District from 21 to 20.

** Note: The THLB areas were based on updated data available in 1999. THLB areas differed from the original information utilised for the initial BEO, which resulted in changes to the overall THLB and the proportion within each LU.

Appendix II: Public Consultation Summary

The Indian LU was advertised for public review and comment for 60 days from August 10, 2002 to October 10, 2002. A summary of comments received and a response or how they were addressed follows:

1. **Recommendation that OGMA selection from the non-contributing land base focus on most productive area to improve representation.** During OGMA selection MSRM made sure that candidate stands were representative of the variant. Evaluation of stand attributes such as: vets, wildlife trees, multi-layered canopy, larger trees, full stocking etc. helped to ensure stands were representative/valuable. Addressing licensee concerns for harvest opportunities in the non-contributing was necessary as part of the mitigation strategy to reduce timber supply impacts.

2. **Biological sufficiency reporting for the Indian indicates inadequate representation of site index, and over representation of steep and cool aspects. This could be addressed by choosing better stands within the non-contributing (as per above).** Biological sufficiency reports are only one tool used to determine OGMA selection versus average indicators of the LU. Following the timber supply mitigation strategy may have skewed representation.

3. **General support for using protected areas proportionally for old forest representation, and that protected areas should not be over represented in OGMAs.** This approach was not used due to an extensive disturbance history in the Indian LU and planning was completed prior to the decision to use parks on a proportional basis.

4. **Disagreement that small, isolated patches with no connectivity should be used for OGMA.** MSRM established OGMAs in a range of different patch sizes from small to large, forest interior habitat will be provided in larger patches. In some cases, natural forest composition consisted of forest interspersed with rock polygons that prevent forest interior habitat conditions. Connectivity was considered during delineation of OGMAs but was difficult to achieve due to the long disturbance history in the TSA.

5. **Lower elevation and valley bottom old growth stands appear to be under represented in the LU.** Low elevation valley bottom stands that are suitable candidates for OGMA (larger contiguous patch) are rare in this planning area due to an extensive disturbance history. MSRM tried to capture these stands wherever possible.

6. **It was noted that some of the OGMAs in non-contributing that are stated to provide potential Marbled Murrelet nesting habitat are adjacent to additional non-contributing lands that were not selected. Several of the adjacent areas appear to have greater nesting habitat suitability than selected OGMAs and if added would improve patch size and value for Marbled Murrelet. These areas should be revisited and OGMAs increased in size to reduce the need for establishing WHAs in the future.** Strict adherence to the LU planning guide policy does not allow achievement of the goals for Marbled Murrelet habitat. In addition, some areas were identified for harvest opportunity by licensees. MSRM acknowledges that there may be need for WHAs on the landscape to manage for species not adequately protected by the coarse filter approach.

Appendix III: Acronyms

AAC	Allowable Annual Cut
BCTS	British Columbia Timber Sales
BEC	Biogeoclimatic Ecosystem Classification
BEO	Biodiversity Emphasis Option
C	Contributing
CMT	Culturally Modified Tree
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 IV: **OGMA Summary and Rationale Description for Indian LU**

OGMA #	BEC VARIANT	CONT CLASS	MAP #	POLY GON	OGMA AREA	THLB AREA	1ST SPP	1ST %	2ND SPP	2ND %	3RD SPP	3RD %	PROJ AGE	PROJ HGT	SITE INDEX	COMMENTS
1	CWH vm 1	N	092G046	1559	3.2	0.0	HW	30	CW	30	FD	20	309	34.3	13.2	alluvial fan, marine foreshore, IA Park
Total					3.2	0.0										
2	CWH vm 1	N	092G046	1555	5.8	0.0	HW	60	CW	40		0	209	26.5	11.6	pot. MAMU habitat, IA Park
2	CWH vm 1	N	092G046	1556	8.8	0.0	HW	55	CW	30	BA	15	269	28.4	11.2	pot. MAMU habitat, IA Park
2	CWH vm 2	N	092G046	1555	2.8	0.0	HW	60	CW	40		0	209	26.5	11.6	pot. MAMU, IA Park
2	CWH vm 2	N	092G046	1556	7.5	0.0	HW	55	CW	30	BA	15	269	28.4	11.2	pot. MAMU, IA Park
Total					24.9	0.0										
3	CWH vm 1	N	092G046	1534	20.9	0.0	HW	60	CW	20	YC	10	309	34.3	13.2	pot. MAMU habitat, cross elev link
3	CWH vm 1	N	092G046	1536	19.5	0.0	CW	60	HW	30	FD	10	341	37.4	16	pot. MAMU habitat, cross elev link
3	CWH vm 1	N	092G046	1537	6.4	0.0	HW	50	CW	40	FD	10	309	34.3	13.2	pot. MAMU habitat, cross elev link
3	CWH vm 1	N	092G046	1540	8.5	0.0	CW	50	HW	40	FD	10	309	36.3	16	pot. MAMU habitat, cross elev link
3	CWH vm 1	N	092G046	1541	5.0	0.0	CW	50	HW	40	FD	10	309	36.3	16	pot. MAMU habitat, cross elev link, IA Park
3	CWH vm 1	N	092G046	1542	50.1	0.0	CW	40	HW	40	FD	20	209	32.4	16.4	pot. MAMU habitat, cross elev link, IA Park
3	CWH vm 1	N	092G046	1544	11.2	0.0	HW	40	MB	30	CW	20	259	41.5	17.6	pot. MAMU habitat, cross elev link, IA Park
3	CWH vm 2	N	092G046	1531	13.2	0.0	HW	60	CW	20	YC	10	309	24.2	9.1	pot. MAMU, cross elev, adj estuary, IA Park
3	CWH vm 2	N	092G046	1534	47.9	0.0	HW	60	CW	20	YC	10	309	34.3	13.2	pot. MAMU, cross elev, adj estuary, IA Park
3	CWH vm 2	N	092G046	1536	4.5	0.0	CW	60	HW	30	FD	10	341	37.4	16	pot. MAMU habitat, cross elev, adj estuary
3	MH mm 1	N	092G046	1531	4.2	0.0	HW	60	CW	20	YC	10	309	24.2	9.1	pot. MAMU, cross elev, adj estuary
3	MH mm 1	N	092G046	1534	41.2	0.0	HW	60	CW	20	YC	10	309	34.3	13.2	pot. MAMU, cross elev, adj estuary, IA Park
3	MH mm 1	N	092G046	1536	1.9	0.0	CW	60	HW	30	FD	10	341	37.4	16	pot. MAMU, cross elev, adj estuary, IA Park
Total					234.4	0.0										
5	CWH vm 1	N	092G046	1504	6.5	0.0	CW	35	HW	35	YC	20	309	38.3	16.9	pot. MAMU habitat
5	CWH vm 2	N	092G046	1504	12.8	0.0	CW	35	HW	35	YC	20	309	38.3	16.9	pot. MAMU habitat
5	CWH vm 2	N	092G046	1511	3.8	0.0	HW	60	BA	40		0	269	30.4	12.1	pot. MAMU habitat
Total					23.1	0.0										
6	CWH vm 1	N	092G056	806	25.1	0.0	HW	70	BA	15	CW	10	278	36.3	14.7	cross elev link
6	CWH vm 1	P	092G056	806	0.2	0.0	HW	70	BA	15	CW	10	278	36.3	14.7	cross elev link
6	CWH vm 2	N	092G056	806	17.9	0.0	HW	70	BA	15	CW	10	278	36.3	14.7	cross elev
Total					43.2	0.0										
7	MH mm 1	N	092G056	492	43.4	0.0	BA	50	HW	40	YC	10	323	32.3	11.1	lake riparian, wetlands
7	MH mm 1	N	092G056	493	7.7	0.0	BA	60	HW	40		0	309	27.4	9.3	lake riparian, wetlands
Total					51.2	0.0										
8	CWH vm 1	N	092G056	466	14.6	0.0	HW	100		0		0	123	38.3	22.9	slide track, combines for larger patch
8	CWH vm 1	N	092G056	467	10.6	0.0	HW	60	CW	30	BA	10	409	34.2	12	slide track, combines for larger patch
8	CWH vm 1	N	092G056	468	0.2	0.0	HW	60	BA	20	YC	20	309	27.3	10.2	slide track, combines for larger patch

Appendix IV: **OGMA Summary and Rationale Description for Indian LU**

OGMA #	BEC VARIANT	CONT CLASS	MAP #	POLY GON	OGMA AREA	THLB AREA	1ST SPP	1ST %	2ND SPP	2ND %	3RD SPP	3RD %	PROJ AGE	PROJ HGT	SITE INDEX	COMMENTS
8	CWH vm 2	N	092G056	466	0.4	0.0	HW	100		0		0	123	38.3	22.9	slide track, combines for larger patch
8	CWH vm 2	N	092G056	467	17.8	0.0	HW	60	CW	30	BA	10	409	34.2	12	slide track, combines for larger patch
8	CWH vm 2	N	092G056	468	2.2	0.0	HW	60	BA	20	YC	20	309	27.3	10.2	slide track, combines for larger patch
8	CWH vm 2	N	092G056	469	1.4	0.0	HW	60	BA	20	YC	20	309	27.3	10.2	slide track, combines for larger patch
Total					47.1	0.0										
9	CWH vm 1	N	092G056	460	6.8	0.0	HW	60	CW	30	BA	10	409	31.2	10.8	slide track, combines for larger patch
9	CWH vm 1	N	092G056	471	5.2	0.0	HW	60	CW	40		0	408	29.2	10.1	slide track, combines for larger patch
9	CWH vm 2	N	092G056	471	8.0	0.0	HW	60	CW	40		0	408	29.2	10.1	slide track, combines for larger patch
Total					20.0	0.0										
10	CWH vm 1	N	092G056	253	21.8	0.0	HW	60	CW	30	BA	10	409	31.2	10.8	pot. MAMU, cross elev., fish rip, slide track
10	CWH vm 1	N	092G056	474	3.8	0.0	HW	60	CW	40		0	408	29.2	10.1	pot. MAMU, cross elev, fish rip, slide track
10	CWH vm 1	N	092G056	476	1.9	0.0	HW	55	BA	30	YC	15	308	29.2	11.1	pot. MAMU, cross elev, fish rip, slide track
10	CWH vm 2	N	092G056	474	15.4	0.0	HW	60	CW	40		0	408	29.2	10.1	pot. MAMU, cross elev, fish riparian, slide track
10	CWH vm 2	N	092G056	475	5.7	0.0	HW	60	CW	40		0	408	29.2	10.1	pot. MAMU, cross elev, fish riparian, slide track
10	CWH vm 2	N	092G056	476	3.4	0.0	HW	55	BA	30	YC	15	308	29.2	11.1	pot. MAMU, cross elev, fish riparian, slide track
10	CWH vm 2	N	092G056	479	3.2	0.0	BA	50	HW	40	YC	10	309	29.4	10.1	pot. MAMU, cross elev, fish riparian, slide track
10	CWH vm 2	N	092G056	480	8.4	0.0	HW	55	BA	30	YC	15	308	29.2	11.1	pot. MAMU, cross elev, fish riparian, slide track
10	CWH vm 2	N	092G056	482	2.8	0.0	BA	50	HW	40	YC	10	309	29.4	10.1	pot. MAMU, cross elev, fish riparian, slide track
10	MH mm 1	N	092G056	480	4.1	0.0	HW	55	BA	30	YC	15	308	29.2	11.1	cross elev link, slide track, pot. MAMU
10	MH mm 1	N	092G056	487	12.0	0.0	HW	60	BA	30	YC	10	359	29.2	10.5	cross elev link, slide track, pot. MAMU
Total					82.5	0.0										
11	CWH vm 1	N	092G056	219	32.1	0.0	YC	40	HW	40	FD	20	309	36.3	16	slide track
11	CWH vm 1	P	092G056	219	0.1	0.0	YC	40	HW	40	FD	20	309	36.3	16	slide track
Total					32.2	0.0										
12	CWH vm 2	C	092G065	624	0.1	0.1	BA	70	HW	20	YC	10	424	43.4	14.5	cross elev, slide track
12	CWH vm 2	N	092G065	624	20.4	0.0	BA	70	HW	20	YC	10	424	43.4	14.5	cross elev, slide track
12	CWH vm 2	N	092G065	625	0.8	0.0	BA	80	HW	20		0	309	35.4	12.7	cross elev, slide track
12	MH mm 1	N	092G065	624	1.0	0.0	BA	70	HW	20	YC	10	424	43.4	14.5	cross elev link, slide track
12	MH mm 1	N	092G065	625	25.0	0.0	BA	80	HW	20		0	309	35.4	12.7	cross elev link, slide track
Total					47.3	0.1										
14	CWH vm 1	N	092G066	1997	0.5	0.0	HW	50	YC	30	BA	20	309	24.2	9.1	cross elev, large patch
14	CWH vm 2	N	092G066	1985	18.2	0.0	BA	60	HW	30	YC	10	424	36.7	11.5	cross elev, large patch
14	CWH vm 2	N	092G066	1987	2.3	0.0	BA	80	HW	20		0	409	33.3	10.3	cross elev, large patch
14	CWH vm 2	N	092G066	1988	7.3	0.0	HW	60	BA	40		0	209	31.6	14	cross elev, large patch
14	CWH vm 2	N	092G066	1989	18.4	0.0	BA	50	HW	40	YC	10	424	34.5	10.6	cross elev, large patch, MGWR, adj DWR

Appendix IV: **OGMA Summary and Rationale Description for Indian LU**

OGMA #	BEC VARIANT	CONT CLASS	MAP #	POLY GON	OGMA AREA	THLB AREA	1ST SPP	1ST %	2ND SPP	2ND %	3RD SPP	3RD %	PROJ AGE	PROJ HGT	SITE INDEX	COMMENTS
14	CWH vm 2	N	092G066	1995	17.9	0.0	HW	60	CW	20	BA	20	309	36.3	14.1	cross elev, large patch
14	CWH vm 2	N	092G066	1997	7.0	0.0	HW	50	YC	30	BA	20	309	24.2	9.1	cross elev, large patch
14	MH mm 1	N	092G066	1985	0.4	0.0	BA	60	HW	30	YC	10	424	36.7	11.5	cross elev link, lake riparian
14	MH mm 1	N	092G066	1987	18.7	0.0	BA	80	HW	20		0	409	33.3	10.3	cross elev link, lake riparian
14	MH mm 1	N	092G066	1989	14.8	0.0	BA	50	HW	40	YC	10	424	34.5	10.6	cross elev link, lake riparian
Total					105.4	0.0										
15	CWH vm 2	C	092G066	2104	0.1	0.1	HW	60	YC	20	BA	20	309	34.3	13.2	lake riparian, cross elev, MGWR
15	CWH vm 2	N	092G066	2104	0.3	0.0	HW	60	YC	20	BA	20	309	34.3	13.2	lake riparian, cross elev, MGWR
15	MH mm 1	N	092G066	2104	17.8	0.0	HW	60	YC	20	BA	20	309	34.3	13.2	cross elev link, lake riparian, PB Park
15	MH mm 1	N	092G066	2111	19.1	0.0	HW	50	YC	30	BA	20	309	32.3	12.3	cross elev link, lake riparian, MGWR, PB Park
15	MH mm 1	N	092G066	2112	9.1	0.0	BA	60	HW	40		0	309	28.4	9.7	cross elev link, lake riparian, PB Park
15	MH mm 1	N	092G066	2113	7.3	0.0	BA	50	HW	30	YC	20	309	30.4	10.5	cross elev link, lake riparian, PB Park
Total					53.8	0.1										
16	CWH vm 2	N	092G056	92	1.2	0.0	HW	60	BA	20	CW	20	309	31.3	11.9	MGWR, cross elev link
16	CWH vm 2	N	092G056	93	1.1	0.0	HW	70	CW	30		0	309	31.3	11.9	MGWR, cross elev link
16	CWH vm 2	N	092G056	94	3.5	0.0	HW	60	CW	30	BA	10	309	30.3	11.5	MGWR, cross elev link
16	CWH vm 2	N	092G056	95	0.3	0.0	HW	70	CW	20	BA	10	308	28.2	10.7	MGWR, cross elev link
16	CWH vm 2	N	092G056	97	1.3	0.0	HW	70	BA	20	YC	10	309	26.3	9.8	MGWR, cross elev link
16	CWH vm 2	N	092G056	98	0.6	0.0	HW	70	BA	20	YC	10	309	26.3	9.8	MGWR, cross elev link
16	MH mm 1	N	092G056	92	2.5	0.0	HW	60	BA	20	CW	20	309	31.3	11.9	MGWR, cross elev. link
16	MH mm 1	N	092G056	93	2.3	0.0	HW	70	CW	30		0	309	31.3	11.9	MGWR, cross elev. link
16	MH mm 1	N	092G056	94	15.9	0.0	HW	60	CW	30	BA	10	309	30.3	11.5	MGWR, cross elev. link
16	MH mm 1	N	092G056	95	17.6	0.0	HW	70	CW	20	BA	10	308	28.2	10.7	MGWR, cross elev. link, PB Park
16	MH mm 1	N	092G056	97	34.7	0.0	HW	70	BA	20	YC	10	309	26.3	9.8	MGWR, cross elev. link, PB Park
16	MH mm 1	N	092G056	98	8.8	0.0	HW	70	BA	20	YC	10	309	26.3	9.8	MGWR, cross elev. link
16	MH mm 1	N	092G056	99	10.3	0.0	HW	80	CW	20		0	309	22.2	8.3	MGWR, cross elev. link, PB Park
16	MH mm 1	N	092G066	2127	1.0	0.0	HW	70	BA	20	YC	10	309	26.3	9.8	MGWR, cross elev link
Total					101.0	0.0										
17	CWH vm 1	N	092G056	151	1.2	0.0	HW	60	BA	30	CW	10	359	40.3	15.1	slide track, MGWR
17	CWH vm 1	N	092G056	161	0.2	0.0	HW	60	BA	30	CW	10	309	31.3	11.9	slide track, MGWR
17	CWH vm 2	N	092G056	151	5.0	0.0	HW	60	BA	30	CW	10	359	40.3	15.1	slide track, MGWR
17	CWH vm 2	N	092G056	160	4.8	0.0	HW	60	BA	30	CW	10	309	31.3	11.9	slide track, MGWR
17	CWH vm 2	N	092G056	161	7.6	0.0	HW	60	BA	30	CW	10	309	31.3	11.9	slide track, MGWR
17	CWH vm 2	N	092G056	163	12.3	0.0	HW	60	BA	40		0	308	29.2	11.1	slide track, MGWR
17	MH mm 1	N	092G056	159	0.8	0.0	HW	55	BA	35	CW	10	358	30.2	10.9	slide track, MGWR

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OGMA #	BEC VARIANT	CONT CLASS	MAP #	POLY GON	OGMA AREA	THLB AREA	1ST SPP	1ST %	2ND SPP	2ND %	3RD SPP	3RD %	PROJ AGE	PROJ HGT	SITE INDEX	COMMENTS
17	MH mm 1	N	092G056	160	0.1	0.0	HW	60	BA	30	CW	10	309	31.3	11.9	slide track, MGWR
17	MH mm 1	N	092G056	163	1.6	0.0	HW	60	BA	40		0	308	29.2	11.1	slide track, MGWR
Total					33.5	0.0										
18	CWH vm 1	N	092G056	159	2.1	0.0	HW	55	BA	35	CW	10	358	30.2	10.9	slide track
18	CWH vm 2	N	092G056	159	15.6	0.0	HW	55	BA	35	CW	10	358	30.2	10.9	cross elev, slide track
18	MH mm 1	N	092G056	159	4.5	0.0	HW	55	BA	35	CW	10	358	30.2	10.9	slide track
Total					22.2	0.0										
19	CWH vm 1	N	092G056	262	2.0	0.0	FD	70	HW	30		0	309	34.2	18	small patch
Total					2.0	0.0										
20	CWH vm 1	N	092G056	271	3.7	0.0	HW	60	BA	20	CW	20	309	29.3	11.1	MGWR
20	CWH vm 1	N	092G056	853	3.0	0.0	HW	40	FD	30	CW	30	309	30.3	11.5	MGWR
20	CWH vm 2	N	092G056	271	10.7	0.0	HW	60	BA	20	CW	20	309	29.3	11.1	MGWR
20	CWH vm 2	N	092G056	853	11.3	0.0	HW	40	FD	30	CW	30	309	30.3	11.5	MGWR
Total					28.7	0.0										
21	CWH vm 1	N	092G056	434	1.2	0.0	HW	50	BA	30	CW	20	409	29.2	10.1	MGWR, cross elev., slidetracks
21	CWH vm 1	N	092G056	435	9.7	0.0	HW	50	YC	20	BA	20	408	35.2	12.4	MGWR, cross elev., slidetracks
21	CWH vm 1	N	092G056	437	7.6	0.0	HW	40	FD	30	CW	30	309	30.3	11.5	MGWR, cross elev., slidetracks
21	CWH vm 2	N	092G056	430	10.2	0.0	HW	50	BA	30	YC	15	408	33.2	11.6	MGWR, cross elev link, slide track
21	CWH vm 2	N	092G056	434	5.2	0.0	HW	50	BA	30	CW	20	409	29.2	10.1	MGWR, cross elev link, slide track
21	CWH vm 2	N	092G056	435	6.5	0.0	HW	50	YC	20	BA	20	408	35.2	12.4	MGWR, cross elev link, slide track
21	CWH vm 2	N	092G056	437	4.0	0.0	HW	40	FD	30	CW	30	309	30.3	11.5	MGWR, cross elev link, slide track
21	MH mm 1	N	092G056	430	0.3	0.0	HW	50	BA	30	YC	15	408	33.2	11.6	MGWR, cross elev, slide tracks
Total					44.7	0.0										
22	CWH vm 2	N	092G056	297	6.7	0.0	HW	60	CW	30	BA	10	359	33.2	12.1	MGWR, lake riparian
22	CWH vm 2	N	092G056	302	8.2	0.0	HW	60	BA	20	CW	20	309	32.3	12.3	MGWR, lake riparian
22	MH mm 1	N	092G056	297	0.1	0.0	HW	60	CW	30	BA	10	359	33.2	12.1	MGWR, lake riparian
Total					15.0	0.0										
23	CWH vm 2	N	092G056	339	2.3	0.0	HW	65	YC	25	BA	10	308	35.3	13.6	adj to larger OGMA
Total					2.3	0.0										
24	CWH vm 2	C	092G056	306	16.6	16.6	HW	65	YC	25	BA	10	308	35.3	13.6	cross elev, fish riparian, wetlands
24	CWH vm 2	C	092G056	307	5.6	5.6	HW	90	BA	10		0	358	40.2	15.1	cross elev, fish riparian, wetlands
24	CWH vm 2	C	092G056	314	11.2	11.2	HW	65	YC	25	BA	10	308	35.3	13.6	cross elev, fish riparian, wetlands
24	CWH vm 2	N	092G056	305	4.5	0.0	HW	65	BA	20	YC	15	308	29.2	11.1	cross elev, fish riparian, wetlands
24	CWH vm 2	N	092G056	306	11.7	0.0	HW	65	YC	25	BA	10	308	35.3	13.6	cross elev, fish riparian, wetlands
24	CWH vm 2	N	092G056	308	4.5	0.0	HW	65	YC	25	BA	10	309	31.3	11.9	cross elev, fish riparian, wetlands

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OGMA #	BEC VARIANT	CONT CLASS	MAP #	POLY GON	OGMA AREA	THLB AREA	1ST SPP	1ST %	2ND SPP	2ND %	3RD SPP	3RD %	PROJ AGE	PROJ HGT	SITE INDEX	COMMENTS
24	CWH vm 2	N	092G056	314	0.3	0.0	HW	65	YC	25	BA	10	308	35.3	13.6	cross elev, fish riparian, wetlands
24	MH mm 1	C	092G056	307	6.6	6.6	HW	90	BA	10		0	358	40.2	15.1	cross elev., fish riparian, wetlands
24	MH mm 1	C	092G056	314	5.5	5.5	HW	65	YC	25	BA	10	308	35.3	13.6	cross elev., fish riparian, wetlands
24	MH mm 1	N	092G056	306	4.7	0.0	HW	65	YC	25	BA	10	308	35.3	13.6	
24	MH mm 1	N	092G056	308	0.2	0.0	HW	65	YC	25	BA	10	309	31.3	11.9	cross elev., fish riparian, wetlands
24	MH mm 1	N	092G056	311	7.9	0.0	BA	50	HW	50		0	309	29.4	10.1	cross elev., fish riparian, wetlands
24	MH mm 1	N	092G056	314	0.3	0.0	HW	65	YC	25	BA	10	308	35.3	13.6	cross elev., fish riparian, wetlands
Total					79.6	45.5										
25	CWH vm 2	N	092G056	345	8.6	0.0	HW	65	BA	35		0	308	26.2	9.8	lake rip, wetlands, cross elev, pot. MAMU, PB Park
25	CWH vm 2	N	092G056	346	1.2	0.0	HW	60	YC	20	BA	20	308	39.3	15.5	lake rip, wetlands, cross elev, pot. MAMU, PB Park
25	CWH vm 2	N	092G056	347	33.7	0.0	HW	60	YC	20	BA	20	308	39.3	15.5	lake rip, wetlands, cross elev, pot. MAMU, PB Park
25	CWH vm 2	N	092G056	383	5.6	0.0	HW	50	CW	30	BA	20	309	39.3	15.5	lake rip, wetlands, cross elev, pot. MAMU, PB Park
25	CWH vm 2	N	092G056	384	6.6	0.0	HW	60	BA	30	YC	10	309	36.3	14.1	lake rip, wetlands, cross elev, pot. MAMU, PB Park
25	CWH vm 2	N	092G056	385	4.8	0.0	HW	50	CW	30	BA	20	309	39.3	15.5	lake rip, wetlands, cross elev, pot. MAMU, PB Park
25	CWH vm 2	N	092G056	390	5.5	0.0	HW	65	BA	35		0	308	26.2	9.8	lake rip, wetlands, cross elev, pot. MAMU, PB Park
25	CWH vm 2	N	092G056	391	18.9	0.0	HW	60	YC	20	BA	20	309	36.3	14.1	lake rip, wetlands, cross elev, pot. MAMU, PB Park
25	CWH vm 2	N	092G056	392	3.6	0.0	HW	45	CW	30	BA	25	308	29.2	11.1	lake rip, wetlands, cross elev, pot. MAMU, PB Park
25	CWH vm 2	N	092G056	393	7.0	0.0	HW	50	CW	30	BA	20	309	32.3	12.3	lake rip, wetlands, cross elev, pot. MAMU, PB Park
25	CWH vm 2	N	092G056	394	1.5	0.0	HW	40	YC	30	BA	30	308	28.2	10.7	lake riparian, wetlands, cross elev, pot. MAMU
25	MH mm 1	N	092G056	343	29.2	0.0	HW	45	CW	30	BA	25	308	29.2	11.1	lake rip., wetlands, cross elev, pot. MAMU, PB Park
25	MH mm 1	N	092G056	345	4.9	0.0	HW	65	BA	35		0	308	26.2	9.8	lake rip., wetlands, cross elev, pot. MAMU, PB Park
25	MH mm 1	N	092G056	346	3.3	0.0	HW	60	YC	20	BA	20	308	39.3	15.5	lake rip., wetlands, cross elev, pot. MAMU, PB Park
25	MH mm 1	N	092G056	347	10.4	0.0	HW	60	YC	20	BA	20	308	39.3	15.5	lake rip., wetlands, cross elev, pot. MAMU, PB Park
25	MH mm 1	N	092G056	392	9.9	0.0	HW	45	CW	30	BA	25	308	29.2	11.1	lake rip., wetlands, cross elev, pot. MAMU, PB Park
25	MH mm 1	N	092G056	393	5.9	0.0	HW	50	CW	30	BA	20	309	32.3	12.3	lake rip., wetlands, cross elev, pot. MAMU, PB Park
25	MH mm 1	N	092G056	394	17.1	0.0	HW	40	YC	30	BA	30	308	28.2	10.7	lake rip., wetlands, cross elev, pot. MAMU, PB Park
Total					177.7	0.0										
26	CWH vm 2	N	092G056	372	3.0	0.0	HW	60	CW	25	BA	15	309	39.3	15.5	lake riparian, PB Park
26	MH mm 1	N	092G056	372	5.8	0.0	HW	60	CW	25	BA	15	309	39.3	15.5	lake riparian, PB Park
Total					8.8	0.0										
27	CWH vm 2	N	092G056	386	16.2	0.0	HW	40	CW	30	BA	30	359	30.2	10.9	fish riparian, MGWR, slide track, PB Park
27	CWH vm 2	N	092G056	387	7.3	0.0	HW	50	YC	30	BA	20	359	36.2	13.4	fish riparian, MGWR, slide track, PB Park
Total					23.4	0.0										
28	CWH vm 2	N	092G056	644	1.5	0.0	YC	40	BA	40	HW	20	308	29.2	12.9	MGWR, PB Park
28	CWH vm 2	N	092G056	648	3.3	0.0	HW	45	CW	35	BA	15	308	32.3	12.3	MGWR, PB Park

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OGMA #	BEC VARIANT	CONT CLASS	MAP #	POLY GON	OGMA AREA	THLB AREA	1ST SPP	1ST %	2ND SPP	2ND %	3RD SPP	3RD %	PROJ AGE	PROJ HGT	SITE INDEX	COMMENTS
28	MH mm 1	N	092G056	644	12.8	0.0	YC	40	BA	40	HW	20	308	29.2	12.9	MGWR, Pinecone Burke Park
28	MH mm 1	N	092G056	648	2.6	0.0	HW	45	CW	35	BA	15	308	32.3	12.3	MGWR, Pinecone Burke Park
Total					20.2	0.0										
29	CWH vm 2	N	092G056	610	4.0	0.0	HW	60	BA	30	CW	10	309	28.3	10.7	small patch
Total					4.0	0.0										
30	CWH vm 1	N	092G056	608	5.1	0.0	HW	50	CW	30	BA	10	359	34.2	12.5	MGWR, DWR
30	CWH vm 1	N	092G056	609	4.4	0.0	HW	60	CW	30	YC	10	258	30.3	12.3	MGWR, DWR
30	CWH vm 2	N	092G056	608	2.3	0.0	HW	50	CW	30	BA	10	359	34.2	12.5	MGWR, DWR
30	CWH vm 2	N	092G056	609	16.0	0.0	HW	60	CW	30	YC	10	258	30.3	12.3	MGWR, DWR
Total					27.8	0.0										
31	CWH vm 1	N	092G056	683	4.1	0.0	HW	60	BA	30	YC	10	258	30.3	12.3	MGWR
31	CWH vm 2	N	092G056	683	7.2	0.0	HW	60	BA	30	YC	10	258	30.3	12.3	MGWR
Total					11.3	0.0										
32	CWH vm 1	N	092G056	681	2.8	0.0	HW	60	BA	30	YC	10	258	30.3	12.3	MGWR
32	CWH vm 2	N	092G056	681	2.9	0.0	HW	60	BA	30	YC	10	258	30.3	12.3	MGWR
Total					5.7	0.0										
33	CWH vm 1	N	092G056	696	12.8	0.0	HW	65	YC	25	BA	10	358	36.2	13.4	slide track
33	CWH vm 2	N	092G056	696	27.5	0.0	HW	65	YC	25	BA	10	358	36.2	13.4	slide track
Total					40.3	0.0										
34	CWH vm 1	C	092G056	748	23.2	23.2	CW	60	HW	30	BA	10	409	39.2	15.9	pot. MAMU, cross elev
34	CWH vm 1	N	092G056	694	3.6	0.0	CW	50	HW	40	BA	10	409	41.2	16.8	pot. MAMU, cross elev, slide track
34	CWH vm 1	N	092G056	723	16.8	0.0	CW	60	HW	30	BA	10	409	38.2	15.5	pot. MAMU, cross elev, slide track
34	CWH vm 1	N	092G056	724	8.4	0.0	HW	65	YC	25	BA	10	358	36.2	13.4	pot. MAMU, cross elev, slide track
34	CWH vm 1	N	092G056	726	12.7	0.0	HW	60	YC	30	BA	10	359	36.2	13.4	pot. MAMU, cross elev, slide track
34	CWH vm 1	N	092G056	727	10.4	0.0	CW	55	HW	40	BA	5	408	36.2	14.7	pot. MAMU, cross elev, slide track
34	CWH vm 2	N	092G056	723	4.2	0.0	CW	60	HW	30	BA	10	409	38.2	15.5	pot. MAMU, cross elev, slide track
34	CWH vm 2	N	092G056	724	14.8	0.0	HW	65	YC	25	BA	10	358	36.2	13.4	pot. MAMU, cross elev, slide track
Total					94.1	23.2										
37	MH mm 1	N	092G046	1580	8.9	0.0	HW	50	BA	30	CW	20	289	30.3	11.8	MGWR
37	MH mm 1	N	092G046	1614	29.9	0.0	HW	40	CW	40	BA	10	289	32.3	12.6	MGWR
Total					38.8	0.0										
38	CWH vm 1	N	092G046	1600	5.2	0.0	HW	40	CW	40	FD	20	289	33.3	13.1	pot. MAMU, cross elev link
38	CWH vm 1	N	092G046	1601	2.5	0.0	HW	70	BA	20	CW	10	159	24.7	12.3	pot. MAMU, cross elev link
38	CWH vm 1	N	092G046	1602	2.0	0.0	HW	60	CW	40		0	289	33.3	13.1	pot. MAMU, cross elev link
38	CWH vm 1	N	092G046	1683	21.2	0.0	HW	40	CW	35	FD	15	309	31.3	11.9	pot. MAMU, cross elev link, IA Park

Appendix IV: **OGMA Summary and Rationale Description for Indian LU**

OGMA #	BEC VARIANT	CONT CLASS	MAP #	POLY GON	OGMA AREA	THLB AREA	1ST SPP	1ST %	2ND SPP	2ND %	3RD SPP	3RD %	PROJ AGE	PROJ HGT	SITE INDEX	COMMENTS
38	CWH vm 1	N	092G046	1718	0.6	0.0	CW	50	HW	40	YC	10	289	45.5	20.5	pot. MAMU, cross elev link, IA Park
38	CWH vm 1	N	092G046	1721	17.6	0.0	HW	50	FD	30	CW	20	289	28.3	10.9	pot. MAMU, cross elev link, IA Park
38	CWH vm 1	N	092G046	1722	5.6	0.0	HW	50	CW	30	FD	20	289	41.4	16.9	pot. MAMU, cross elev link, IA Park
38	CWH vm 1	N	092G046	1723	24.5	0.0	HW	60	CW	20	FD	20	289	28.3	10.9	pot. MAMU, cross elev link, IA Park
38	CWH vm 1	N	092G046	1724	13.4	0.0	HW	50	CW	30	FD	20	289	41.4	16.9	pot. MAMU, cross elev link, IA Park
38	CWH vm 1	N	092G046	1726	6.4	0.0	HW	60	CW	20	BA	20	159	29.8	15.1	pot. MAMU, cross elev link, IA Park
38	CWH vm 1	N	092G046	1727	4.0	0.0	HW	70	BA	20	CW	10	159	24.7	12.3	pot. MAMU, cross elev link, IA Park
38	CWH vm 1	N	092G046	1737	3.3	0.0	HW	50	CW	30	FD	20	289	41.4	16.9	pot. MAMU, cross elev link, IA Park
38	CWH vm 2	N	092G046	1601	1.2	0.0	HW	70	BA	20	CW	10	159	24.7	12.3	pot. MAMU habitat, cross elev, IA Park
38	CWH vm 2	N	092G046	1602	15.6	0.0	HW	60	CW	40		0	289	33.3	13.1	pot. MAMU habitat, cross elev, IA Park
38	CWH vm 2	N	092G046	1603	7.7	0.0	HW	55	CW	31	YC	8	269	27.3	10.8	pot MAMU habitat, cross elev link
38	CWH vm 2	N	092G046	1606	8.5	0.0	HW	50	BA	35	CW	15	289	31.3	12.2	pot MAMU habitat, cross elev link
38	CWH vm 2	N	092G046	1608	2.9	0.0	HW	50	BA	42	YC	8	359	31.2	11.3	pot MAMU habitat, cross elev link
38	CWH vm 2	N	092G046	1673	1.7	0.0	HW	80	CW	20		0	289	36.4	14.5	pot MAMU habitat, cross elev link, IA Park
38	CWH vm 2	N	092G046	1674	2.1	0.0	HW	60	CW	20	BA	20	289	34.4	13.5	pot MAMU habitat, cross elev link, IA Park
38	CWH vm 2	N	092G046	1676	3.0	0.0	HW	40	BA	40	CW	20	289	32.3	12.6	pot MAMU habitat, cross elev link, IA Park
38	CWH vm 2	N	092G046	1679	7.6	0.0	HW	40	CW	30	BA	30	259	30.4	12.3	pot MAMU habitat, cross elev link, IA Park
38	CWH vm 2	N	092G046	1683	19.4	0.0	HW	40	CW	35	FD	15	309	31.3	11.9	pot MAMU habitat, cross elev link, IA Park
38	CWH vm 2	N	092G046	1718	1.5	0.0	CW	50	HW	40	YC	10	289	45.5	20.5	pot MAMU habitat, cross elev link, IA Park
38	CWH vm 2	N	092G046	1726	1.2	0.0	HW	60	CW	20	BA	20	159	29.8	15.1	pot MAMU habitat, cross elev link, IA Park
38	MH mm 1	N	092G046	1606	19.1	0.0	HW	50	BA	35	CW	15	289	31.3	12.2	pot. MAMU, cross elev.
38	MH mm 1	N	092G046	1608	5.3	0.0	HW	50	BA	42	YC	8	359	31.2	11.3	pot. MAMU, cross elev.
38	MH mm 1	N	092G046	1641	22.4	0.0	HW	55	CW	30	BA	15	309	30.3	11.5	pot. MAMU, cross elev.
38	MH mm 1	N	092G046	1673	8.0	0.0	HW	80	CW	20		0	289	36.4	14.5	pot. MAMU, cross elev.
38	MH mm 1	N	092G046	1674	10.7	0.0	HW	60	CW	20	BA	20	289	34.4	13.5	pot. MAMU, cross elev.
38	MH mm 1	N	092G046	1676	21.7	0.0	HW	40	BA	40	CW	20	289	32.3	12.6	pot. MAMU, cross elev.
38	MH mm 1	N	092G046	1679	9.7	0.0	HW	40	CW	30	BA	30	259	30.4	12.3	pot. MAMU, cross elev.
Total					275.6	0.0										
39	CWH vm 1	N	092G046	1595	1.9	0.0	HW	60	CW	30	FD	10	309	32.3	12.3	small patch, lower slope
Total					1.9	0.0										
40	CWH vm 1	N	092G046	1597	2.0	0.0	HW	60	CW	30	FD	10	309	32.3	12.3	small patch, lower slope, IA Park
Total					2.0	0.0										
41	CWH vm 1	N	092G046	1733	5.9	0.0	FD	40	HW	40	CW	20	309	33.2	17.5	adj foreshore rec use, Hydro RW, IA Park
Total					5.9	0.0										
42	CWH vm 1	N	092G046	1735	3.4	0.0	HW	50	CW	30	FD	20	289	41.4	16.9	adj foreshore rec use, Hydro RW, IA Park

Appendix IV: **OGMA Summary and Rationale Description for Indian LU**

OGMA #	BEC VARIANT	CONT CLASS	MAP #	POLY GON	OGMA AREA	THLB AREA	1ST SPP	1ST %	2ND SPP	2ND %	3RD SPP	3RD %	PROJ AGE	PROJ HGT	SITE INDEX	COMMENTS
42	CWH vm 1	N	092G046	1736	1.5	0.0	HW	60	CW	20	FD	20	289	28.3	10.9	adj foreshore rec use, Hydro RW, IA Park
42	CWH vm 1	N	092G046	1738	3.0	0.0	HW	50	FD	30	CW	20	289	28.3	10.9	adj foreshore rec use, Hydro RW, IA Park
Total					7.8	0.0										
43	CWH vm 1	N	092G046	1721	5.1	0.0	HW	50	FD	30	CW	20	289	28.3	10.9	low elev, riparian, IA Park, adj Hydro RW
Total					5.1	0.0										
44	CWH vm 2	N	092G046	1659	16.1	0.0	CW	40	YC	20	HW	20	289	36.4	16.3	pot. MAMU, IA Park
44	CWH vm 2	N	092G046	1660	1.8	0.0	HW	50	BA	30	CW	10	309	33.8	13	pot. MAMU, IA Park
44	MH mm 1	N	092G046	1659	7.9	0.0	CW	40	YC	20	HW	20	289	36.4	16.3	pot. MAMU
44	MH mm 1	N	092G046	1660	21.7	0.0	HW	50	BA	30	CW	10	309	33.8	13	pot. MAMU
Total					47.4	0.0										
45	CWH vm 2	N	092G046	1691	17.1	0.0	HW	60	CW	30	BA	10	309	32.3	12.3	pot MAMU habitat, cross elev link, IA Park
45	CWH vm 2	N	092G046	1692	14.1	0.0	CW	40	HW	30	YC	20	309	34.3	15.1	pot MAMU habitat, cross elev link, IA Park
45	CWH vm 2	N	092G046	1698	1.0	0.0	HW	60	CW	30	BA	10	309	32.3	12.3	pot MAMU habitat, cross elev link, IA Park
45	MH mm 1	N	092G046	1692	27.8	0.0	CW	40	HW	30	YC	20	309	34.3	15.1	pot. MAMU, cross elev.
45	MH mm 1	N	092G046	1693	7.3	0.0	HW	50	BA	30	CW	10	309	33.8	13	pot. MAMU, cross elev.
Total					67.1	0.0										
46	CWH vm 1	N	092G046	1771	9.6	0.0	HW	40	FD	20	CW	20	289	33.3	13.1	cross elev, adj Hydro RW, slide track, IA Park
46	CWH vm 1	N	092G046	1772	3.1	0.0	BA	60	CW	30	HW	10	269	29.5	10.9	cross elev, adj Hydro RW, slide track, IA Park
46	CWH vm 1	N	092G046	1780	7.4	0.0	HW	40	CW	30	FD	20	289	34.4	13.5	cross elev, adj Hydro RW, slide track, IA Park
46	CWH vm 1	N	092G046	1782	4.4	0.0	HW	50	CW	30	FD	20	289	34.4	13.5	cross elev, adj Hydro RW, slide track, IA Park
46	CWH vm 2	N	092G046	1771	5.6	0.0	HW	40	FD	20	CW	20	289	33.3	13.1	cross elev, adj Hydro RW, slide track, IA Park
46	CWH vm 2	N	092G046	1780	7.2	0.0	HW	40	CW	30	FD	20	289	34.4	13.5	cross elev, adj Hydro RW, slide track, IA Park
Total					37.3	0.0										
47	CWH vm 1	C	092G056	453	3.6	3.6	FD	80	CW	5	AC	5	73	32.2	28	fish riparian, Hydro RW, part DWR
47	CWH vm 1	C	092G056	558	4.7	4.7	HW	60	FD	20	AC	10	139	41.3	23.4	fish riparian, Hydro RW, part DWR
47	CWH vm 1	C	092G056	563	5.1	5.1	HW	60	FD	20	AC	10	139	41.3	23.4	fish riparian, Hydro RW, part DWR
47	CWH vm 1	C	092G056	565	5.6	5.6	FD	80	CW	5	AC	5	73	32.2	28	fish riparian, Hydro RW, part DWR
Total					19.0	19.0										
49	CWH vm 1	C	092G056	176	10.7	10.7	FD	50	HW	30	CW	20	159	30.6	19.1	fish riparian, licensee suggested
49	CWH vm 1	C	092G056	226	9.2	9.2	HW	50	CW	30	BA	20	409	49.2	18.8	fish riparian, licensee suggested
49	CWH vm 1	C	092G056	227	2.2	2.2	CW	65	HW	35		0	411	44.3	18	fish riparian, licensee suggested
Total					22.1	22.1										
Grand Total					2040.4	110.0										

Appendix IV: **OGMA Summary and Rationale Description for Indian LU**

OGMA #	BEC VARIANT	CONT CLASS	MAP #	POLY GON	OGMA AREA	THLB AREA	1ST SPP	1ST %	2ND SPP	2ND %	3RD SPP	3RD %	PROJ AGE	PROJ HGT	SITE INDEX	COMMENTS

TITLE ABBREVIATIONS:	**COMMENT ABBREVIATIONS:**
CONT CLASS: contributing class	pot. MAMU: potential marbled murrelet habitat
1ST SPP: leading tree species for species compostion	MGWR: mountain goat winter range
1ST %: percent of leading tree species	DWR: deer winter range
2ND SPP: secondary tree species	PB Park: Pinecone Burke Park
2ND %: percent of secondary tree species	IA Park: Indian Arm Park
3RD SPP: third tree species	cross elev link: cross elevational linkage
3RD %: percent of third tree species	lake rip: lake riparian
PROJ AGE: projected age	fish rip: fish riparian
PROJ HGT: projected height	