

Sunshine Coast Forest District Landscape Unit Planning

Bunster Landscape Unit Plan

2000/09/21

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Bunster Landscape Unit Plan

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Proposed Order to Establish a Landscape Unit (L.U.) and Objectives

Bunster Landscape Unit

Pursuant to Section 4 of the Forest Practices Code of British Columbia Act, I hereby establish the Bunster Landscape Unit, an area located in the Bunster Hills, Sunshine Coast Forest District, effective September 22, 2000.

The boundaries of the Bunster Landscape Unit are shown on the 1:50,000 scale map, dated September 5, 2000, attached to this Order.

In addition, I hereby establish objectives for the Bunster Landscape Unit, as attached to this Order, effective September 22, 2000.

(Original signed by)

District Manager, Sunshine Coast Forest District

Date

File: ORCS 12500-25
Resource Planing,
Landscape Unit Planning –
Bunster Landscape Unit

**NOTICE OF PROPOSED ESTABLISHMENT OF LANDSCAPE UNIT AND
OBJECTIVES
BUNSTER LANDSCAPE UNIT**

Notice is hereby given that, pursuant to Section 4 of the *Forest Practices Code of British Columbia Act* (FPC), the Bunster Landscape Unit and its objectives are proposed for establishment on September 15, 2000, by the District Manager for the Sunshine Coast Forest District.

Establishment of a landscape unit and objectives is the legal mechanism to make key biodiversity conservation requirements binding under the FPC.

Copies of the prepared order, objectives, a map showing the proposed location and boundaries of the landscape unit, as well as a backgrounder, are available at the Sunshine Coast Forest District Office, the District's Sechelt Field Office, the Ministry of Forest's Regional Office in Nanaimo and the Ministry of Environment, Lands and Parks, Lower Mainland Office (addresses given below) for a 60 day review period, commencing from the date of publication of this notice.

Ministry of Forests
Sunshine Coast Forest District
7077 Duncan Street
Powell River, BC V8A 1W1

Ministry of Forests
Sunshine Coast Forest District
Sechelt Field Office
1975 Field Road
Sechelt, BC V0N 3A0

Ministry of Forests
Vancouver Regional Office
2100 Labieux Road
Nanaimo, BC V9T 6E9

Ministry of Environment, Lands and Parks,
Lower Mainland Regional Headquarters,
10470 – 152 Street,
Surrey, BC V3R 0R3

Please submit written comments on this proposal to:

Greg Hemphill, District Manager
Sunshine Coast Forest District
7077 Duncan Street
Powell River, British Columbia
V8A 1W1

The Province certifies that the services purchased pursuant to this agreement are for the use of, and are being purchased by, the Province of British Columbia, with crown funds, and are therefore not subject to the Federal Goods and Services Tax.

Objectives for the Bunster Landscape Unit

Pursuant to section 4 of the Forest Practices Code of B.C. Act, the following are landscape unit objectives for the Bunster Landscape Unit.

Objective 1

Maintain or recruit old growth ecosystem values, in old growth management areas, that are established as shown on the attached Map 1. No timber harvesting, including salvage, is to occur within old growth management areas. Road construction is not to occur within old growth management areas unless no other practicable options exist, in which case replacement old growth management areas may be required.

Objective 2

Maintain structural diversity within managed stands by retaining wildlife trees within the boundaries of each cut-block to meet targets for each BEC subzone in the landscape unit as indicated in the table below:

- All non-contributing areas with high value wildlife trees must be used first to achieve the overall cutblock target.
- 25 per cent of the % WTR will come from high value wildlife trees in the timber harvesting landbase averaged over the cutblocks in the forest development plan
- It is acceptable on a single cutblock to be +/- 2% WTR limits, for biological reasons, provided that the average level of retention is achieved on all blocks proposed within the applicable sub zone of the current forest development plan.
-

**Wildlife Tree Retention by Biogeoclimatic
Ecosystem Classification Subzone**

BEC Subzone	% WTR
CDFmm	7
CWHxm1	8
CWHdm	10
CWHvm2	10
MHmm1	6

WTR = Wildlife Tree Retention

BEC = Biogeoclimatic Ecosystem Classification

CDFmm: Coastal Douglas-fir biogeoclimatic zone, moist maritime subzone.

CWHxm1: Coastal Western Hemlock biogeoclimatic zone, very dry maritime subzone, windward variant.

CWHdm: Coastal Western Hemlock biogeoclimatic zone, dry maritime subzone.

CWHvm2: Coastal Western Hemlock biogeoclimatic zone, very moist maritime subzone, montane variant.

MHmm1: Mountain Hemlock biogeoclimatic zone, moist maritime subzone, variant 1-windward.

These objectives are without prejudice to all First Nations' interests.

Sunshine Coast Forest District Landscape Unit Planning

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1.0 Introduction

The Bunster Landscape Unit (LU) lies within the Georgia Depression Ecoprovince, and the Georgia Lowland Ecosection. Lower elevation, productive and gentle-terrain sites have, to a large degree, been disturbed by past harvesting, land clearing, fire and other factors. The low levels of old seral forest representation within the Bunster's low elevation biogeoclimatic zones reflects this disturbance history.

The Bunster LU's proximity to Powell River and other Northern Sunshine Coast communities has a major effect on the relative values of the LU's resources and their corresponding management strategies. The LU contains a wide range of significant natural resource values and features, as well as a diversity of social and cultural influences. As a result, management of these values involves many complex issues.

The productivity and accessibility of the forests increases many of the timber resource values. Compared to other LUs in the Sunshine Coast Forest District (SCFD) the Bunster has a very high proportion of sites accessible for forest operations and many sites are only a short drive from local communities. Many of these sites are low-elevation, operable throughout the year, and a high proportion have high site indexes, providing good opportunities for intensive silviculture investments. Such sites are, therefore, very important for creating local employment opportunities in all aspects of forestry. Similarly, the accessibility of the Bunster forests increases recreational opportunities for local communities. A high degree of access has the potential to negatively affect some wildlife species and biodiversity in general through human presence, hunting/gathering and the introduction of foreign species.

A large amount of private land exists within the LU, both as urban/residential land and as industrial and commercial holdings. Residents value the forest adjacent to their lands for recreation, aesthetics, harvesting of botanical forest products, community setting, and for local employment. Industrial land holders continue to harvest timber, and operate tourism businesses. Much of the private land within the Bunster LU has been significantly altered from its original ecological state; in some cases this influences the ecology of adjacent Crown lands, a factor that was considered during Old Growth Management Area (OGMA) delineation. Crown lands must also be managed in a manner sensitive to the interests of adjacent private landholders.

The Bunster LU contains many forms of ownership and tenure including: Private land (residential, industrial, commercial, Managed Forest), Crown forest, Indian reserve, municipality, Provincial Forest, woodlots (2), forest licence (major 4, minor 2) Tree Farm License, Provincial park, community watershed, UREPs and timber salvage areas. All of these forms of tenure influence LU management.

Three species of Identified Wildlife occur within the Bunster LU: the marbled murrelet (MAMU), the mountain goat, and the grizzly bear. As outlined in the Identified Wildlife Management Strategy (IWMS) the MAMU is to be managed through the placement of OGMAs within suitable MAMU habitat. This has been done in the Bunster LU, though with significant

Bunster LU-specific modifications to Biogeoclimatic subzone representation. Mountain goat winter range habitat has been identified previously by the Ministry of Environment, Lands and Parks (MOELP), and OGMA's have been placed within areas constrained by this resource value where suitable. OGMA's have also been placed to maximize overlap with other high value wildlife habitats such as black tailed deer winter range, bald eagle nesting areas, foreshore habitats and riparian areas which include potential grizzly bear feeding sites.

The OGMA's shown on Map 1 are to be excluded from timber harvesting activities, including salvage. OGMA's include both existing old growth stands and recruitment stands which will be retained to develop old growth characteristics over time. Road construction through OGMA's is not to occur unless no other practicable options exist, in which case, designation of replacement OGMA's may be required.

The distribution of OGMA's and other old seral representation areas will have to be reviewed periodically. Many stands within Desolation Sound Marine Park and other non-contributing areas (not contributing to the TSA's AAC) will mature over time and develop old seral characteristics. These areas may then replace some OGMA's that are within the THLB.

Wildfires and other natural disturbance may occur within OGMA's with varying effects on their biodiversity attributes. Each instance of natural disturbance will have to be considered separately. In many cases old seral forest may be suited for biodiversity following a fire with its high density of large snags. Some specific old seral habitat features may be lost due to natural disturbances, and OGMA's may need to be replaced.

The Bunster Landscape Unit Plan is without prejudice to First Nations interests, including aboriginal rights and traditional uses.

2.0 Landscape Unit Objectives

The Bunster LU received a Biodiversity Emphasis Option (BEO) of "Intermediate" through the biodiversity value ranking and the BEO assignment processes (see Appendices I, II & IV). Table 1, below, lists the percentages of the LU's productive forest area per natural disturbance type (NDT) designated for old seral representation as OGMA. The percentages of cutblock area required as Wildlife Tree Patches (WTP) for each of the LU's biogeoclimatic ecological classification (BEC) units are also listed. The target figures listed in Table 1 are from the Landscape Unit Planning Guide (LUPG), Appendices 2 and 3.

Note: Objectives apply only to Provincial forest lands. Park and 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 and Wildlife Tree Patches.

BEC Unit and NDT	LUPG Old Seral Representation Recommendation ²		OGMA Objective Provincial Forest ³		Protected Area or Non-Provincial Forest Contribution ⁴		Total Old Seral Representation		WTP Objective ⁵
	%	ha	%	ha	%	Ha	%	ha	% of cutblock area, ha
CDFmm, 2	9	42.0	0.94	4.4	8.06	37.6	9.00	42.0	7
CWHxm1, 2	9	885.5	4.40	429.1	4.60	456.4	9.00	885.5	8
CWHdm, 2	9	1105.7	5.13	630.5	0	0	5.13	630.5	10
CWHvm2, 1	13	1201.7	18.14	1682.3	0	0	18.14	1676.9	10
MHmm1, 1	19	883.7	19.00	883.7	0	0	19.00	883.7	6

1) NDT = Natural Disturbance Type. Refer to LUPG, Appendix 2.

2) % of total productive forest area within BEC unit, as per LUPG.

3) % of total productive forest area within BEC unit, as per LUPG, minus contributions from old seral representation within protected areas and Crown forest outside of Provincial forest.

4) Protected areas contribute to old seral representation but are not designated as OGMA.

5) WTP Objectives as per the LUPG, Appendix 3. Table A3.1 applies upon the designation of the Landscape Unit and its objectives.

CDFmm: Coastal Douglas-fir biogeoclimatic zone, moist maritime subzone.

CWHxm1: Coastal Western Hemlock biogeoclimatic zone, very dry maritime subzone, windward variant.

CWHdm: Coastal Western Hemlock biogeoclimatic zone, dry maritime subzone.

CWHvm2: Coastal Western Hemlock biogeoclimatic zone, very moist maritime subzone, montane variant.

MHmm1: Mountain Hemlock biogeoclimatic zone, moist maritime subzone, variant 1; windward.

OGMA Objectives listed in Table 1 have been met through the delineation of OGMA throughout the Bunster LU. Refer to Map 1 entitled “Bunster Landscape Unit OGMA” for their location, to Appendix V for OGMA statistics and attributes, and to Table 2, below, for a breakdown of OGMA non-contributing (NC), constrained Timber Harvesting Landbase (THLB) and unconstrained THLB components.

TABLE 2

Non - Contributing, Constrained THLB and Unconstrained THLB Components of Bunster LU OGMA:

BEC Unit	Total Old Seral Representation ¹	Non - Contributing ² Area in OGMA		Constrained THLB ³ in OGMA		Unconstrained THLB in OGMA	
	ha	ha	%	ha	%	ha	%
CDFmm	42.0	0	0	42.0	100	0.0	0
CWHxm1	885.5	483.1	54.6	402.4	45.4	0.0	0
CWHdm	630.5	81.5	12.9	504.7	80.1	44.3	7.0
CWHvm2	1676.9	542.4	32.3	903.7	53.9	230.8	13.8
MHmm1	883.7	568.3	64.3	268.0	30.3	47.4	5.4
%TOTALS	4118.6	1675.3	40.7	2120.8	51.5	322.5	7.8

1 Total Old Seral Representation from Table 1, above.

2 Non - Contributing Area in OGMA = 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.

3.0 Biodiversity Management Goals and Strategies

3.1 General Management Goals

Biodiversity management goals and strategies describe, in specific terms, the outcomes that the LU Objectives are to achieve. They also describe the rationale for the selection of OGMA, some of the ecological features that OGMA are to include, and some of the compromises made to balance the management of all values present in the LU. While Objectives are legally binding, management goals and strategies are not. Goals and strategies must remain flexible to incorporate future direction and new methods to continue to meet the LU Objectives.

The biodiversity ranking process identified many significant biodiversity values within the Bunster LU that must be managed for. The delineation of OGMA cannot be undertaken without recognition of these significant values because OGMA delineation is the most effective provision of the Forest Practices Code (FPC) LU planning initiative for managing such biodiversity. Refer to Appendix IV for detailed description of Bunster LU values considered in the LU planning process.

The development of biodiversity management goals and strategies is important not only for the conservation of biodiversity, but also to allow the 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 AAC contributions, as this approach could result in the inclusion of stands of marginal biodiversity value and significant timber supply impact within OGMA. Individual forested polygons were assessed according to their specific attributes during the OGMA delineation process.

In the Bunster LU, management of MAMU nesting habitat is a key management goal; the Bunster Hills is considered to contain some of the highest value MAMU nesting habitat in the Georgia Depression Ecoprovince. In light of these high habitat values, additional OGMA representation has been transferred from the CWHdm, where old growth representation and MAMU habitat options are both significantly limited, to the CWHvm2 zone. This approach is specific to the Bunster LU and is consistent with the direction of the IWMS. OGMA have been located in the THLB with a priority consideration for MAMU habitat, as per the direction of the IWMS, the LU Planning Guide, and the April 12, 1999 joint MOF/MOELP letter “Integrating Wildlife Habitat for Marbled Murrelet and Old Growth Management Areas in Landscape Unit Planning” (Appendix VI).

Of the 13 areas of MAMU nesting habitat identified by BC Environment F&W within the Bunster LU, 10 have been included in OGMA. Of 63 MAMU nest sites located in the Bunster LU (1998), 58 (92%) are within OGMA.

The majority of currently suitable and active MAMU nesting habitat is within the CWHvm2 and MHmm1 biogeoclimatic zones. Very little suitable nesting habitat currently exists in the lower elevation ecosystems due to drier ecology (less mossy platforms) and past disturbance history (high degree of forest fragmentation). During OGMA delineation, efforts were made to include stands in the lower elevation subzones which contain old growth structures or which can recruit old growth structures in the shortest possible time frame. Numerous age class 7 and 8 stands

were included in OGMA in the CWHxm1 and CWHdm subzones. Stands with a significant veteran component were assessed and included as OGMA old growth recruitment areas where they provided specific wildlife or biodiversity attributes. In all cases, detailed air photo review was performed to confirm forest cover attributes and suitability of a given stand for OGMA inclusion. Numerous stands were checked aerially or on the ground to verify the presence of desirable old seral and habitat characteristics.

3.2.1 CDFmm Biodiversity Management Goals

1. Attain old seral representation, to the CDFmm objective of 0.94%, or 4.4 ha within Provincial forest (currently 0%) The old seral objective for the CDFmm is lower than the recommended 9% target of the Biodiversity Guidebook because of the lack of suitable OGMA candidate areas and small area in Provincial forest within the CDFmm. An additional 8.06% or 37.6 ha of forested stands have been identified as providing biodiversity representation, but are outside the Provincial forest and, therefore, are not eligible for OGMA designation. (Refer to Map 1, “Bunster Landscape Unit OGMA’s”)
2. Maintain areas that are representative of natural CDFmm ecosystem patterns and ecosystem mosaics.
3. Maintain the opportunity to manage for multiple resource values within OGMA’s in a manner compatible with biodiversity management.
4. Minimize the timber supply impacts of establishing OGMA’s while achieving biodiversity management objectives.
5. Enhance stand level structural diversity throughout the CDFmm.

3.2.2 CDFmm Biodiversity Management Strategies

- A. Delineate OGMA’s to include the oldest stands available, or stands that are currently developing old growth characteristics. (Goals 1, 2, 3)
- B. Include unique and constrained areas within OGMA. (Goals 2, 4)
- C. Retain veterans within harvesting areas and dominants as veteran recruits (Fd as well as CW, Hw) as a focus of stand level biodiversity management. (Goal 5)
- D. Acknowledge limits to biodiversity management options imposed by land status, proximity of urban lands, public access and disturbance history. (Goals 1, 3, 4, 5)

3.3.1 CWHxm1 Biodiversity Management Goals

1. Increase old seral representation within the Provincial forest portions of the CWHxm1 (currently approximately 3%) to meet LU objective of 4.2%, or 399.1ha. An additional 4.8% or 456.4 ha providing suitable biodiversity representation has been identified within

Desolation Sound Marine Park, which does not require OGMA designation. (Refer to Map 1, “Bunster Landscape Unit OGMAs”).

2. Maintain a wide range of ecosystem types and species composition (habitat types) within the CWHxm1.
3. Maximize interior forest condition within OGMAs.
4. Include areas of multiple resource values (i.e. recreation, specific wildlife habitat needs) within OGMAs where compatible with biodiversity management.
5. Enhance stand level structural diversity throughout the CWHxm1.
6. Minimize timber supply impacts of establishing OGMAs, notably on second growth harvesting and on future silviculture opportunities, in local, easily accessed, highly productive areas where compatible with biodiversity management.

3.3.2 CWHxm1 Biodiversity Management Strategies

- A. Delineate OGMAs to include existing old growth stands and mature stands that contain developing OG characteristics and veterans. (Goal 1)
- B. Delineate OGMAs to be as large and contiguous as possible and to contain as wide a range of sites as possible. Delineate OG recruitment OGMAs within stands that will contribute to the total interior forest condition and the connectivity between OG OGMAs where such placement does not impact the THLB. (Goals 2, 3, 4)
- C. Retain veterans and dominants as veteran recruits within harvesting areas (Fd as well as CW, Ss, Hw) as a focus of stand level biodiversity management. (Goals 2, 5)
- D. Include unique features and constrained areas within OGMAs where compatible with biodiversity management. (Goals 4, 6)

3.4.1 CWHdm Biodiversity Management Goals

1. Increase old seral representation within the CWHdm (currently approximately 3.5%) to meet the objective of 5.13%. The old seral objective for the CWHdm is lower than the LUPG-recommended level of 9% because there is currently a deficit of old growth and suitable old growth recruitment stands (those containing old growth characteristics, vets and mature) and to facilitate the transfer of OGMA area to the CWHvm2 for additional OGMA delineation within identified suitable MAMU habitat. (Refer to Map 1, “Bunster Landscape Unit OGMAs”, and section 3.1 above.)
2. Include areas that are constrained due to the presence of multiple resource values (recreation, specific wildlife habitat needs) within OGMAs where compatible with biodiversity management.
3. Enhance stand level structural diversity throughout the CWHdm.

4. Minimize the timber supply impacts of establishing OGMA, notably on second growth harvesting and on silviculture opportunities, in local, easily accessed, highly productive sites where compatible with biodiversity management.

3.4.2 CWHdm Biodiversity Management Strategies

- A. Include existing age class 9 stands, age class 8 stands and stands with a significant veteran component (oldest stands available) within OGMA. (Goals 1, 3)
- B. Include unique features and constrained areas within OGMA where compatible with biodiversity management. (Goals 2, 4)
- C. Include old seral stands identified by MOELP F&W as suitable MAMU nesting habitat within OGMA. (Goals 1, 2)
- D. Retain veterans and dominants as veteran recruits within harvesting areas, (Fd as well as CW, Ss, Hw, Ba, Cy) as a main goal of stand level biodiversity management. (Goals 2, 3)
- E. Allow for greater timber opportunities within the CWHdm by moving OGMA area to the CWHvm2, leaving sites with higher productivity, higher value timber, easier access and logistics within the THLB. (Goal 4)

3.5.1 CWHvm2 Biodiversity Management Goals

1. Maintain old seral representation within the CWHvm2 (currently approximately 42%) to the objective level of 18.14%. The old seral objective for the CWHvm2 has been increased to 18.14% from the LUPG-recommended level of 13% to allow additional OGMA delineation within high value MAMU habitat. This increase in OGMA % has been achieved by the transfer of 475.2 ha of OGMA area from the CWHdm. (Refer to Map 1, “Bunster Landscape Unit OGMA”, and to section 3.1 above.)
2. Include as much identified MAMU habitat as possible within OGMA.
3. Include suitable forested portions of mountain goat winter range habitat in the Theodosia River watershed in OGMA.
4. Retain natural ecosystem patterns and mosaics characteristic of the CWHvm2: Maximize interior forest condition within OGMA. Maintain a wide range of ecosystem types and species composition (habitat types) within the CWHvm2.
5. Reduce impacts on timber supply while maintaining OGMA habitat, and biodiversity values
6. Enhance stand level structural diversity throughout the CWHvm2.

3.5.2 CWHvm2 Biodiversity Management Strategies

- A. Delineate OGMA to include existing age class 9 stands to achieve the OG retention target immediately. The increased OG retention target will be met by transferring some OG target area from the CWHdm BEC unit. (Goals 1, 2, 3, 4)
- B. Delineate OGMA to include identified MAMU habitat, including higher-ranked habitat areas as a priority. 475.2 ha of OGMA area transferred from the CWHdm, which would have directly impacted unconstrained THLB, has been applied to the CWHvm2 THLB. (Goals 2, 5)
- C. Allow for greater timber opportunities within the CWHdm by moving 475.2 ha of OGMA area to the CWHvm2, leaving sites with higher productivity, higher value timber, easier access and logistics within the THLB. (Goal 5)
- D. Delineate OGMA to include suitable forested portions of identified UWRs within the Theodosia River watershed, in TFL 39. (Goals 3, 4, 5)
- F. Retain wildlife trees and dominants as veteran recruits within harvesting areas, (of all species present) as a main goal of stand level biodiversity management. (Goal 6)

3.6.1 MHmm1 Biodiversity Management Goals

- 1. Maintain old seral representation within the MHmm1 (currently approximately 75%) to the LUPG-recommended level of 19.0%. (Refer to Map 1, “Bunster Landscape Unit OGMA’s”).
- 2. Maintain the most suitable old growth to provide for MAMU habitat and management options. To ensure protection of high value MAMU nesting habitat, inclusion of MHmm1 THLB in OGMA is required. Levels of NC forest in the MHmm1 do exceed LUPG levels but do not provide suitable MAMU nesting habitat.
- 3. Maintain stands required for UWR.
- 4. Minimize impacts on THLB where compatible with biodiversity management.

3.6.2 MHmm1 Biodiversity Management Strategies

- A. Delineate OGMA to include suitable MAMU habitat. (Goals 1, 2,)
- B. Delineate OGMA to include suitable forested portions of identified UWRs as possible within the Theodosia River watershed, in TFL 39. (Goals 3, 4)
- C. Include stands in OGMA with least amount of operable timber and highest MAMU habitat suitability, where these values are compatible. (Goals 1, 2, 4)

4.0 Mitigation of Timber Supply Impacts

The Bunster LU plan has been developed to maximize the effectiveness of the FPC's biodiversity management provisions while minimizing impacts on the Sunshine Coast TSA and TFL timber supplies. Within the Bunster LU there are chart areas for numerous volume-based tenures, and it has not been possible to distribute LU planning impacts evenly among them all, nor is it the objective to do so. Instead, LU planning in the SCFD aims to minimize impacts to timber supply as a whole across the entire TSA and TFL areas. Chart area rationalization may be required following the completion of the SCFD's LU planning, which may be a more effective means of distributing LU impacts.

Specific measures adopted to minimize impacts of Bunster LU planning to the timber supply include the following:

Protected areas, UREPs, ESAs, community interface areas, CMT locations, mountain goat winter range, VQO area, lower productivity sites, and areas of difficult access were included within OGMA's where possible and where compatible with biodiversity objectives.

During the LU planning process, careful consideration was made to ensure that timber access was not cut off by OGMA delineation. Access corridors were left out of OGMA's and OGMA boundaries were delineated to simplify adjacent management.

Given the deficit of old growth as well as the lack of suitable MAMU habitat and OGMA recruitment areas in the CWHdm, 475.2 ha from the CWHdm were transferred to the CWHvm2. This transfer ensures the inclusion of the most suitable MAMU nesting habitat in OGMA's and situates them in sites that have, on average, lower timber supply impacts compared to the CWHdm. The 475.2 ha transferred to the CWHvm2 was the OGMA area remaining after NC, constrained and areas of significant biodiversity value were selected for OGMA in the CWHdm. More OGMA delineation within the CWHdm would have come from relatively high-value unconstrained THLB stands. These THLB stands, being even-aged, uniform, early seral stands have less significant biodiversity values than the higher elevation old growth being traded for. (The Bunster LU is an Intermediate BEO so recruitment OGMA must be selected from the areas that will become old seral in the shortest possible timeframe, which would be the valuable maturing second growth). Reallocation of OGMA landbase ensures that more highly productive, accessible second growth stands within the CWHdm remain available for timber harvesting.

Areas to be included in OGMA's were assessed according to MAMU habitat/habitat priority, 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 not included in OGMA's due to their lowered habitat suitability and ease of industrial access. Areas with high MAMU habitat suitability and a lower degree of habitat fragmentation are generally more difficult to access and have little existing industrial infrastructure. Inclusion of such areas in OGMA ensures protection of the most suitable MAMU nesting

habitats, minimizes impacts on timber supply through overlap of constraints and allows continued use of existing roads for future harvesting.

Many non-contributing areas are not included as OGMA at this time, mostly due to their young age class and absence of old growth characteristics. Significant portions of the OGMA's for the CWHxm1 are within the Desolation Sound Marine Park and riparian management areas and are unavailable for timber harvesting. As stands in these areas mature they may become suitable as OGMA replacing those within the THLB. Riparian management initiatives, such as creating old growth features, may speed up the progress of some stands towards becoming OGMA. Periodic assessment and revision of OGMA's will be required.

Bunster Landscape Unit Summary of Public Input

File: ORCS 12500-25/Bunster

September 15, 2000

The Bunster Landscape Unit (LU) Plan was released on June 25, 2000 for a 60 day public review period as well as a 45 day agency review period, review periods ending on August 8 and August 24 respectively. Following these review periods revisions were made to the draft plan based on the information received. The following individuals and organizations made submissions:

International Forest Products Ltd.
Maria Hunter
Sunshine Coast Conservation Association
Colin R. Campbell
Hayes Logging Company Ltd.
Sylvia Woodsworth
Canquest Resources Company Ltd.
Weyerhaeuser Ltd. Stillwater Division
MOF's Small Business Forest Enterprise Program
Laura Walz
Fred Cooke

Within the submissions from the individuals and organizations above, the following points and comments were made:

- The Bunster LU plan appears to be a best-case scenario within the given policy constraints.
- The Bunster LU's biodiversity emphasis option assignment of intermediate is appropriate.
- The Bunster LU plan's goals and objectives are appropriate.
- More habitat information is required to determine if provisions are sufficient to protect viable populations of existing species.
- Borrowing representation from one biogeoclimatic zone and moving it to another is not acceptable because old growth management areas (OGMA) serve a coarse filter role and the amounts per zone are minimums.
- Forest that is not part of the timber harvesting landbase should not be included as OGMA.
- It is not clear if roads, harvesting or salvage is allowed within OGMAs.
- More area is needed for Marbled Murrelet (MAMU) habitat.
- A Regional process is required to provide adequate MAMU habitat.
- Policy limits the effectiveness of the Identified Wildlife Management Strategy provisions as well as those of the *Forest Practices Code*.
- All MAMU habitat should be maintained until it can be demonstrated that the population has stabilized or is recovering.

- Landscape Unit Planning Guide connectivity provisions should not be lower priority, and should be incorporated at this time.
- MAMU habitat and mountain goat winter range polygons and information is confusing.
- How does the Bunster LU plan affect First Nations Interests?
- OGMA's have significant impacts on Hayes chart area without significant contribution to MAMU habitat.
- Map does not show forest cover information and forest license chart areas.
- Not enough non-contributing [to the AAC] forest has been included in OGMA's.
- Mining tenures should be shown on the map and mining tenure holders should have been more closely involved.

The following changes were made to the draft Bunster Landscape Unit Plan as a result of the information received from the public review process:

- Forest cover polygon boundaries have been added to the 1:50,000 scale map.
- Forest licensee chart areas have been added to the 1:50,000 scale map.
- Veteran trees as well as veteran recruitment trees are to be retained within harvested areas within each of the biogeoclimatic zones.
- OGMA in Hayes Logging Ltd's chart area was exchanged for higher value MAMU habitat adjoining another OGMA.
- OGMA's are defined as areas excluded from harvesting and salvage, and roadbuilding may only occur if there are no other options, in which case other OGMA may be delineated.
- A disclaimer was added to the Bunster Plan objectives to state that the Bunster LU plan is without prejudice to First Nations Interests including traditional uses.
- The rationale for the transfer of OGMA area from the CWHdm to the CWHvm2 was rewritten for clarity.
- MAMU habitat and mountain goat winter range have been removed from the map.

Appendix I

Biodiversity Ranking Process: Ranking Criteria Rationale and Criteria

BEO Ranking Criteria Rationale

98/05/13

Application of the Landscape Unit Ranking Criteria

The three categories of Biodiversity Emphasis Option (BEO) ranking criteria that have been developed for the Sunshine Coast Forest District are to be scored and considered in a separate manner. The first set of criteria, the ecological values, are to be scored first, determining an initial BEO ranking for the District's landscape units (LU). In ranking the LUs, the LU with the highest ecological values score is ranked number one, the next highest, number two. The timber values are scored next, with their resultant scores being used as tie-breakers for LUs that have generated similar scores through the ecological values criteria. Timber values scores rank in an opposite manner: out of two or more LUs that have similar ecological value scores, the LU with the lowest timber value score will be ranked highest. Thirdly, the other values criteria are scored, and they are used as tie-breakers for LUs that have scored similarly in both ecological and timber values. Higher other values scores rank the LU higher.

The criteria are being applied in a separate, priority manner placing ecological values as the first priority because the entire BEO ranking process is designed to determine which LUs have biodiversity values that most require the additional biodiversity provisions of Higher and Intermediate BEOs. This is consistent with the FPC "Higher Level Plans: Policy and Procedures" October 31, 1996 (HLPPP) Section 5.10.2 Assignment of Biodiversity Emphasis Options - Chief Forester Direction - Policy, subsection 5, page LU15.

The FPC HLPPP offers two separate directions regarding protected areas and their affects on a LU's BEO ranking and assignment. In Section 5.10.2, page LU14 it states that first, higher BEOs should be assigned to LUs where ecosystems are poorly represented within existing protected areas, and then, further on it states that higher BEOs should be assigned for LUs adjacent to protected areas. The Sunshine Coast Landscape Unit Planning Team has followed the first direction because the Sunshine Coast Forest District received somewhat less protected area forest ecosystem representation than some other Districts making ecosystem representation a higher priority, and the location of some of the protected areas do not offer easily achievable opportunities for connectivity.

1) Ecological Values

Ecological Values criteria assess which of the District's Landscape Units require higher levels of biodiversity provisions.

a) LU NDT 2 OG Representation Opportunity (Current state)

Landscape Units should rank higher if they have greater amounts of old growth forest because they have more potential to meet the seral stage requirements of the Biodiversity Guidebook, and have a greater number of biodiversity management options available. This criteria assesses the present amount of old growth, not recruitable areas. Old growth

representation is assessed by the remaining percentages of old growth within the NDT2 areas of the LUs. NDT1 representation does not need to be considered because of logging history; if NDT1 is depleted, NDT2 will be more so. NDT1 is considered where NDT2 makes up less than 10% of the LU's THLB. Percentages used to assign scores for this criteria are based on the percentages required for old seral stage representation for each BEO in NDT2.

b) Recruitment Potential to Manage for Old Growth

LUs that are underrepresented in old growth may have age class 8 stands that may be recruited to provide old growth management areas of suitable habitat to meet the old seral stage biodiversity management requirements. If so, they are better suited to meeting the biodiversity requirements of a higher-level BEO and should be given a higher ranking. The percentages used to assign scores for this criteria, as in A above, are based on the percentages required for old seral stage representation for each BEO in NDT2.

c) Ecosystem Complexity

the greater the number of BEC units within a Landscape Unit, the greater the potential is that the LU provides habitat for a wider range of species compared to a LU with less BEC units. It is also more likely that a LU with numerous BEC units will be habitat for species that require a wider range of habitat. LUs with potential to be habitat for a larger number of species earn a higher ranking for biodiversity values.

d) Specific Wildlife Habitat Requirements

LUs that contain species that require specific habitat, ecosystems or ecosystem complexes are likely to require higher levels of habitat provision. LUs with species present that have been identified as being regionally significant, threatened or endangered may need to have habitat provided for them out of the operable landbase at higher than minimal levels, so these LUs will receive higher biodiversity rankings. Higher or Intermediate BEOs provide a greater range of habitat management options.

e) Sensitivity to Forest Development

Conversion of natural forest stands to even-aged management regimes reduces the range of habitats available to support an area's natural diversity of species. This reduction in habitat is greater in NDT 1 which is naturally uneven-aged, than in NDT 2 which is naturally even-aged. The greater the proportion of NDT 1 within a LU, the more the LU requires a higher BEO to provide habitat management options.

f) Connectivity

In addition to the presence of Old Growth, its spatial distribution is very important when assessing the biodiversity management options that remain within a LU. Higher BEO ranking scores will be given under this criteria to those LUs that have old seral stage forest in large contiguous stands, or in areas where harvesting has not disrupted natural connectivity due to natural patchy non-contiguous patterns.

g) Complex Ecosystems

LUs that contain large floodplains, estuaries, wetlands and herbaceous slidetrack/forest complexes are inherently habitat to a wider range of species than those LUs that do not. LUs that contain significant habitat features, in a District-wide context, will receive higher BEO

ranking scores from this criteria to increase their eligibility to receive a BEO that will provide opportunities for maintenance of appropriate representation and linkages.

h) Inoperable Land Habitat and Biodiversity Representation

This criteria assesses the need for increasing the LU's priority and emphasis for biodiversity management by determining how much of a LU's biodiversity objectives can be met by default through habitat located in protected and constrained areas.

2) Timber Values Criteria

Timber values criteria assess the relative timber values of the District's Landscape Units and consider short and long term contributions of the LU to the TSA in terms of value and volume. In the event of a tie of ecological criteria scores at the division between BEO assignment, Timber Values Criteria will be assessed to establish the BEO ranking. In order to minimize the impact on the timber supply in the long term, the LU with the lower timber value score will be given the higher BEO ranking.

a) Potential Timber Productivity

This criteria compares the products of LU average site index multiplied by THLB area. This represents the potential of the LU to produce timber. This criteria is intended to minimize impacts on the long-term timber supply.

b) Timber Maturity

This criteria gives higher ranking to LUs that have greater amount of mature timber available for harvest. This criteria is intended to minimize the impacts on timber supply in the short term.

c) Timber Value

This criteria assigns scores based on the relative value of timber harvested from the various LUs. Information associated with timber value appraisal would be considered. This criteria is intended to make LUs where timber values are high more likely to have a lower BEO ranking. Higher scores increase the BEO ranking of the Landscape Unit.

3) Other Resource Values

Resource Values besides ecological and timber values are considered with these criteria. The need for higher or lower BEO ranking is assessed based on the effects of other resource uses on biodiversity, and the impacts of provisions for other resource use on timber supply.

a) Visual Sensitivity

This criteria assigns higher scores for a LU if it is more visually sensitive to overlap the impacts of constraining VQOs with higher BEO assignments in order to minimize any reductions to the TSA's AAC.

b) Recreation/Tourism Significance and Capability

This criteria assigns higher scores for a LU if it has higher recreation values, for present and future use, in order to overlap the impacts of recreational and biodiversity provisions to minimize reductions to the TSA's AAC.

c) Mining, Hydro and Urbanization

Mining, Hydro (damming, pipelines, generation sites, and rights of way) and urbanization have potential to interfere with biodiversity management options and objectives. This criteria will assign lower scores where this potential exists.

d) Cultural Heritage Significance

This criteria assigns higher scores to LUs with higher cultural heritage significance. Based on consultation with affected First Nations and availability of traditional use and archaeology information.

**Sunshine Coast Forest District
DRAFT -98/09/09**

Landscape Unit Ranking Criteria for Biodiversity Emphasis Option Assignment

Draft Landscape Unit Ranking criteria is based on three separate sets of criteria. **Ecological Values Criteria** are first used to establish an initial ranking. **Timber Values Criteria** are then applied to LUs with similar Ecological Values scores. LUs with similar scores following the Timber Values ranking will be further assessed through the **Other Resource Values Criteria**. This ranking process is consistent with the direction within the FPC Higher Level Plans: Policy and Procedure, Chapter 5, section 5.10.

1) Ecological Values Criteria

(higher scores = higher BEO ranking)

a) LU NDT 2 OG Representation Opportunity (Current state)

Percentage of the LU's NDT 2 productive forest in old seral stage.
(NDT1 to be considered if NDT2 <10% of THLB)

>13%	H	8 points
>9-13%	M/H	6 points
>3-9%	M	4 points
>1-3%	L/M	2 points
0-1%	L	0 points

b) Recruitment Potential to Manage for Old Growth in NDT2

Options to manage for old growth using age class 8 and 9 combined.

>13%	H	4 points
>9-13%	M/H	3 points
>3-9%	M	2 points
1-3%	L/M	1 point
0-1%	L	0 points

c) Biogeoclimatic Complexity

For the number of Biogeoclimatic subzone variants within the LU:

7-8	H	5 points
6	M/H	4 points
5	M	3 points

4	L/M	2 points
3	L	1 point
1-2	VL	0 points

d) Specific Wildlife Habitat Requirements

This criteria is based on the presence of species that have been recognized as requiring specific forest habitat, (including regionally significant species, threatened and endangered species (according to Provincial tracking lists).

H	8 points
M/H	6 points
M	4 points
L/M	2 points
L	0 points

e) Sensitivity to Forestry Development

Based on the % of the productive forest land in the Landscape Unit within Natural Disturbance Type 1 :

81 - 100	H	4 points
61 - 80	M/H	3 points
41 - 60	M	2 points
21 - 40	L/M	1 point
0 - 20	L	0 points

f) Connectivity

Based on the relative abundance of options that remain to manage for natural connectivity and to meet connectivity objectives considering the current state of the LU.

H	4 points
M/H	3 points
M	2 points
L/M	1 point
L	0 points

g) Ecosystem Complexes

Based on the presence of significant, large floodplains, wetlands, estuaries, and herbaceous slidetrack/forest complexes.

H	8 points
M/H	6 points
M	4 points
L/M	2 points
L	0 points

h) Inoperable Land Habitat and Biodiversity Representation

Based on the amount of old seral stage representation and forest habitat (that is suitable to the biodiversity and wildlife needs of the LU) that is present within the LU, but does not contribute to timber harvesting landbase. (PAS areas, inoperable terrain, riparian reserves and otherwise constrained areas) Representation within all or any of the BEC units to be considered as well as interior forest condition

availability.

H	0 points
M/H	1 points
M	2 points
L/M	3 points
L	4 points

2) Timber Values Criteria

(higher values = lower BEO ranking)

a) **Potential Timber Productivity**

Relative productivity of LUs will be assessed in terms of the LU's average site index. (SI50) multiplied by the LU's THLB.

b) **Timber maturity and Mature Timber Availability**

Based on the percentage of the LU's operable land base stocked with mature timber, and the amount of it available for harvest considering constraints imposed by VQOs, ESAs and Community Watersheds. Mature is greater than 120 years. Total all of the mature and 50% of the timber in age classes 40 - 120 years:

>50%	H	5 points
41 - 50%	M/H	4 points
31 - 40%	M	3 points
21 - 30%	L/M	2 points
11 - 20%	L	1 point
0 - 10%	VL	0 points

c) **Timber Value**

Based on the estimated appraisal value of the LU's average stand within the LU's operable landbase, relative to all other LUs in the District.

H	5 points
M/H	4 points
M	3 points
L/M	2 points
L	1 point
VL	0 points

3) Other Resource Values (higher values = higher BEO ranking)

a) **Visual Sensitivity**

VQO based on the percentage of the operable forest landbase within the LU with a of P, R, PR from the landscape inventories.

>51%	H	5 points
41 - 50%	M/H	4 points
31 - 40%	M	3 points

21 - 30%	L/M	2 points
11 - 20%	L	1 point
0 - 10%	VL	0 points

b) Recreation/Tourism Significance and Capability

Based on the LU's potential to provide for recreational use and potential of area to be of interest and attraction to tourists, now and in the future, relative to all other LUs in the District.

H	5 points
M/H	4 points
M	3 points
L/M	2 points
L	1 point
VL	0 points

c) Mining, Hydro and Urbanization

This criteria considers the potential for mining, hydroelectric projects, right of ways and urbanization, in its present and future states, to interfere with the ecological integrity or biodiversity values of the LU, relative to all other

landscape

units. "H" represents greatest effects on the LU's biodiversity.

H	0 points
M/H	1 point
M	2 points
L/M	3 points
L	4 points
VL	5 points

d) Cultural Heritage Significance

This criteria assigns higher scores to LUs with higher cultural heritage

significance.

Based on consultation with affected First Nations and availability of

traditional use

and archaeology information.

H	5 points
M/H	4 points
M	3 points
L/M	2 points
L	1 point

Appendix II

Sunshine Coast Forest District Landscape Unit Ranking and Biodiversity Emphasis Option Assignment.

LU Name	LU Number	Biodiversity Score	Rank	THLB Area (ha)	BEO Assigned	Planning Priority
Toba	207	42	1	12813	H	13
Skwawka	213	37	2	3726	H	2
Homathko	201	36	3	8453	H	4
Southgate	203	35	4	3446	H	16
Deserted W/S*	219*	N/A	N/A	2462	H	5
				30899	9.7%	
Brem	206	35	5	4883	I	9
Jervis (including Deserted River)	219	33	6	17246	I	5
Bute West	202	32	7	4508	I	19
Bute East	205	32	8	6504	I	12
Powell Daniels	211	31	9	2903	I	17
Brittain	218	27	10	8785	I	8
Bishop	204	26	11	1488	I	24
Salmon	224	26	12	19869	I	15
Homfray	209	24	13	8642	I	20
Quatam	208	23	14	8752	I	7
Narrows	223	23	15	10979	I	14
Howe	226	21	16	10939	I	6
Cortes	214	18	17	21517	I	10
Bunster	215	18	18	23057	I	1
				150072	47.2%	
Lois	217	17	19	53544	L	22
Powell Lake	212	16	20	14229	L	21
Chapman	225	14	21	15917	L	3
Texada	219	13	22	13837	L	18
Sechelt	221	12	23	26082	L	11
Haslam	216	8	24	13597	L	23
				137206	43.1%	
			Total THL B	318177	100%	

* Deserted River Watershed, part of the Jervis LU, assigned “Higher” to utilize more of the 10% allotment for the SCFD.

SCFD LU Planning Team: Brian R. Smart, Darryl M. Reynolds, Steve M. Gordon.
98/09/09

Bunster LU Appendix III

Landscape Unit Old Seral Target Summary: All Management Units

<i>BEC Variant</i>	<i>Seral Stage</i>	<i>Productive Forest (ha)</i>	<i>Non Contributing Area (ha)</i>		<i>THLB Area (ha)</i>		<i>Target %</i>	<i>Full Old from Seral Target (ha)</i>	<i>Area required from Seral THLB (ha)</i>	<i>1/3 of Old THLB Target (ha)</i>	<i>Area required from</i>
			<i>Area (ha)</i>	<i>Constrained</i>	<i>Unconstrained</i>						
Landscape Unit: Bunster											
BEO: Intermediate											
Planning Area: District:											
LM-Sunshine Coast DSC											
CDF mm	Early	5.0	5.0	1.1%			<36		0.0		0.0
CDF mm	Early Mature	300.5	179.1	38.4%		121.4	26.0%		0.0		0.0
CDF mm	Mature	160.6	24.4	5.2%		136.3	29.2%		0.0		0.0
CDF mm	Old	0.0	0.0	0.0%				>9	42.0	42.0	0.0
Total for CDF mm		466.1 ha	208.5 ha		ha	257.6 ha			42.0	42.0	0.0
CWH dm	Early	1619.4	102.1	0.8%	11.1	0.1%	1506.2	11.5%	<36		0.0
CWH dm	Early Mature	5890.2	1696.9	13.0%	27.9	0.2%	4165.5	31.8%			0.0
CWH dm	Mature	4910.4	651.8	5.0%	96.4	0.7%	4162.3	31.8%			0.0
CWH dm	Old	663.9	328.6	2.5%			335.4	2.6%	>9	1177.6	849.0
Total for CWH dm		13083.9 ha	2779.3 ha		135.3 ha	10169.3 ha				1177.6	849.0
CWH vm2	Early	3084.3	246.6	2.7%			2837.7	30.7%	<30		0.0
CWH vm2	Early Mature	1000.9	248.0	2.7%			752.9	8.1%			0.0
CWH vm2	Mature	1238.1	196.8	2.1%			1041.4	11.3%			0.0
CWH vm2	Old	3920.9	1939.7	21.0%			1981.3	21.4%	>13	1201.7	0.0
Total for CWH vm2		9244.2 ha	2631.0 ha		ha	6613.2 ha				1201.7	0.0
CWH xm1	Early	718.6	78.6	0.8%			640.1	6.5%	<36		0.0
CWH xm1	Early Mature	3514.2	1368.5	13.9%	60.0	0.6%	2085.7	21.2%			0.0
CWH xm1	Mature	5293.0	1663.0	16.9%	31.1	0.3%	3599.0	36.6%			0.0
CWH xm1	Old	313.4	258.2	2.6%			55.2	0.6%	>9	885.5	627.3
Total for CWH xm1		9839.3 ha	3368.3 ha		91.0 ha	6380.0 ha				885.5	627.3
MH mm 1	Early	690.5	13.7	0.3%			676.8	14.6%	<22		0.0
MH mm 1	Early Mature	179.6	74.9	1.6%			104.8	2.3%			0.0
MH mm 1	Mature	256.9	73.1	1.6%			183.9	4.0%			0.0
MH mm 1	Old	3524.0	3042.8	65.4%			481.3	10.3%	>19	883.7	0.0
Total for MH mm 1		4651.1 ha	3204.4 ha		ha	1446.7 ha				883.7	0.0
Total for Bunster LU		37856.1 ha	12761.6 ha		226.4 ha	24868.2 ha			4190.5	1518.2	0.0

Appendix IV

Significant Ecological Features in the Bunster LU

This Appendix includes specific information regarding the Bunster Landscape Unit's (LU) biodiversity values that were considered in the biodiversity ranking and BEO assignment processes, and during the evaluation of stands for inclusion as OGMA's. Headings **a)** through **h)** correspond to the LU BEO ranking criteria. (Refer to "BEO Ranking Criteria Rationale 98/09/13", and "Criteria for Biodiversity Emphasis Option Assignment Process 98/09/09", Appendices I and II)

a) LU NDT2 Old Seral Representation

BEC Units and Seral Stage Distribution

Table 1.

The Bunster LU BEC units, corresponding natural disturbance types (NDT) and OG representation based on 1999 VFR inventory summary data:

BEC	NDT	TOTAL OG	
		%	ha
CDFmm	2	0	0
CWHdm	2	2.5	663.9
CWHxm1	2	2.6	313.4
CWHvm2	1	21.0	3920.9
MHmm1	1	65.4	3524.0

Table 2

The Bunster LU BEC units, BGB representation targets, LU Old Seral Representation Targets, LU OGMA Representation Objectives, and LU Non- Provincial Forest Old Seral Representation. based on 1999 VFR inventory summary data and detailed polygon analysis including reductions for recent and proposed harvesting, as per 1995 - 2000 TFL + TSA FDP submissions:

BEC UNIT	BGB Representation Target ¹		LU Old Seral Representation Targets ²	LU OGMA Representation Objectives ³		LU Non-PF Old Seral Representation ⁴	
	%	ha		%	ha	%	ha
CDFmm	9	42	42	0.94	4.4	8.06	37.6
CWHxm1	9	885.5	885.5	4.36	429.1	4.64	456.4
CWHdm	9	1105.7	630.5	5.13	630.5	0	0.0
CWHvm2	13	1201.7	1676.9	18.14	1676.9	0	0.0
MHmm1	19	883.7	883.7	19	883.7	0	0.0
Totals	-	4118.6	4118.6	-	3624.6	-	494.0

NOTES:

- 1) **BGB Representation Target** = % of old seral stage representation recommended in the Biodiversity Guidebook.
- 2) **LU Old Seral Representation Targets** = Bunster LU-specific targets for old seral representation, includes LU OGMA, non-Provincial Forest, and Park contributions.

3) **LU OGMA Representation Objectives** = legally established representation objectives for OGMA's.

4) **Non-Provincial Forest Old Seral Representation** = Old seral representation from Crown forest that is not within Provincial forest. This representation cannot be included as LU OGMA, or as a LU Objective.

Current old seral (age class 9) representation levels are below target for the Intermediate BEO in the CDFmm, CWHxm1, and CWHdm BEC units. Old seral representation in the higher elevation BEC units (CWHvm2 and MHmm1) are above target levels.

Old growth patches less than 2ha, that are remnants left after harvesting, are not considered to contribute to old growth representation at the landscape-level for the following reasons:

Areas ≤ 2 Ha from logging origin have a high degree of fragmentation and edge effect, subsequently, they are no longer representative of original ecosystem. As a result they are no longer capable of being habitat to the full range of species that originally occupied the site. Although they do provide valuable contributions to biodiversity, it is at the stand level, not the landscape level. The intention of OGMA's is to fulfil the landscape level habitat requirements for the LU's natural levels of biodiversity through the "coarse filter" approach; encompassing as many species' habitats as possible. Small remnant patches, of diminished habitat capability, cannot fill this role and their biodiversity contribution must be limited to that of stand-level.

Natural stands ≤ 2 Ha may be completely typical of natural stand structure, and may continue to function in its natural state. Natural edges are less intrusive than artificial edges (harvesting). Small natural patches may provide important habitat attributes at edges of natural openings such as swamps, rock outcrops, etc. Their OG contribution, however, could be diminished or eliminated in some cases if larger adjacent OG forest is removed. For example, a number of small patches of old timber within a slide track complex may provide temporary cover for a number of species that forage in the slide track but require larger adjacent areas of OG in close proximity for thermal and visual cover, escape and denning habitat and snow interception. They may no longer contribute as natural habitat for a specific species if they become significantly isolated from the other required habitat type.

It will become increasingly difficult to map and track the contributions of patches smaller than 2ha. Some small patches will be reduced in size by windfall following harvesting and it is unlikely that this reduction would be accounted for.

Note: This approach is consistent with principles outlined in the BGB and Guide to LU Planning.

b) Recruitment potential to manage for old growth.

OGMA and Old seral representation stands are predominantly age classes 7, 8 and 9 and stands with a significant veteran component. The occasional younger stand was selected for specific stand attributes. Together, these stands will be managed to meet the old growth % retention targets for the LU.

A significant amount of otherwise constrained areas such as riparian reserve zones, sensitive soils, etc. have not been included in OGMA's at this time because these areas will not provide old growth attributes in the shortest possible time frame as per the HLPPP direction for an Intermediate BEO. As such stands mature they may be re-assessed for OGMA inclusion.

c) Ecosystem Complexity.

The Bunster LU contains 6 BEC units, indicating a moderate - high level of ecosystem complexity. This ecosystem complexity was accounted for through OGMA delineation at the level of Biogeoclimatic variant.

d) Specific Wildlife Habitat Requirements.

The Bunster LU is habitat to the following species requiring specific forest habitat: marbled murrelet, grizzly bear (Theodosia), mountain goat (Theodosia).

e) Sensitivity to Forest Development.

Only 18% of the Bunster LU is within Natural Disturbance Type 1 (Ecosystems with rare stand initiating events). This area is the higher elevation portions of the LU. The majority of the LU is within NDT2 (Ecosystems with infrequent stand initiating events), thus the LU is considered to have a low sensitivity to forest development overall.

f) Connectivity.

The Bunster LU has a fairly heavy harvesting and disturbance history throughout, and particularly in lower elevation BEC units. Recent harvesting in the CWHvm2 has resulted in significant forest fragmentation. Advanced second growth exists in the lower portions of the LU, and connectivity from foreshore to higher elevations exists. Opportunities to maintain connectivity through second growth management adjacent to natural riparian linkages/ gully systems will improve over time as the forests mature and OGMA distribution is revised. The Theodosia River portion of the LU has been extensively harvested; very little valley-bottom old growth exists there at present.

Consistent with the LU Planning Guide, connectivity is not a primary objective of the Bunster LU plan, however, the opportunity to maintain connectivity (i.e. degree of remaining management options) is an important criteria for BEO assignment as it is an indicator of the degree of harvesting and road density in a given LU. Connectivity management will continue in the long-term for the Bunster LU.

g) Complex Ecosystems.

The Theodosia portion of the LU contains significant slide track/forest complexes in addition to a small but significant river estuary and flood plain. The upper Bunster Hills contains an extensive network of forest/swamp ecosystems. In a District-wide context, the Bunster LU has a low to moderate level of large ecosystem complexes. Large bluff complexes in the Theodosia River watershed have been assessed for ungulate winter range habitat values and included in OGMA's where appropriate.

h) Inoperable Land Habitat and Biodiversity Representation.

The Bunsters LU has significant OGMA contribution from the following non-contributing and constrained lands:

- ESAs
- Protected Areas (Desolation Sound Marine Park)
- UREPs
- High recreation use areas
- Steep terrain, gullies
- Riparian areas
- forested land of marginal productivity (low SI_{50})

Mapsheet BEC Unit	Polygon	Inventory Label	SI50	m3/ha	ha	Constraints / Comments	Non- Contributing	THLB		total m3	Level of constraint	Impact avail.m3
								constrained	unconstrained			
	447	FdCw(HwDr) 4305	24	326.6	17.6	VQO, SC trail, vets, PAS	#	17.6		5748.2	50	2874.1
	445	Fd 9614	25	699.1	20.0	VQO, steep, difficult access, SC trail, PAS	#	20		13982.0	50	6991.0
	451	Fd 8515	27	743.8	46.9	VQO,steep, lake, rocky, SC trail, PAS	#	46.9		34884.2	50	17442.1
	455	Fd(PI) 8515	25	662.8	11.9	VQO, rocky, SC trail PAS	#	11.9		7887.3	50	3943.7
	602	Fd 9415	18	413.3	8.9	VQO, steep,SBFEP Cat I block, pot.MAMU, PAS	#	8.9		3678.4	50	1839.2
	616p	Fd(Cw) 8515	25	669.8	46.4	Er, VQO, SBFEP Cat I block, PAS	#	46.4		31078.7	90	3107.9
	599	Fd 8314	16	286	18.5	Low SI, very low m3, trail, gully, VQO, silv., PAS	18.5					
	606p	Fd(PI) 4406	24	345.8	25.4	CW, vets, ungulate values, rocky, silv, field reviewed		25.4		8783.3	90	878.3
	571p	FdCw(PI) 9	21	345.8	3.5	CW, vets, ungulate values, rocky, silv, field reviewed		3.5		1210.3	90	121.0
	609	FdCw5505	31	675.4	5.2	CW, vets, ungulate values, rocky, silv, field reviewed		5.2		3512.1	90	351.2
	611p	FdCw(HwPI) 5306	23	375	2.3	CW, vets, ungulate values, rocky, silv, field reviewed		2.3		862.5	90	86.3
	44	FdCw5505	31	675.4	2.8	CW, vets, ungulate values, rocky, silv, field reviewed		2.8		1891.1	90	189.1
	571p	FdCw(Hw) 9	21	675.4	5.6	CW,marsh, OG patch in spaced polygon		5.6		3782.2	100	0.0
	465	Fd(CwHw) 8515	22	535.5	10.3	Er, VQO, Coode Island, vets		10.3		5515.7	90	551.6
	464	Fd 5305	21	327.7	5.6	Er, VQO, Coode Island, vets		5.6		1835.1	90	183.5
	467	Fd(CwHw) 9415	20	462.6	16.6	Er, VQO, Coode Peninsula & Island		16.6		7679.2	90	767.9
	470	Fd(Cw) 5406	24	380.9	8.8	Er, VQO, Coode Peninsula, vets		8.8		3351.9	90	335.2
	621	FdCw 8516	27	824.4	23.1	Er, VQO, Coode Peninsula, vets		23.1		19043.6	90	1904.4
	622	FdCwHw3306	24.8	142.4	6.6	E2r, VQO, Coode Peninsula, vets		6.6				
	623	FdHwCw5404	24.2	425.8	2.6	Er, VQO, Coode Peninsula, vets		2.6				
	624	FdCw(Hw) 5505	29	646.9	9.3	Er, VQO, Coode Peninsula, vets		9.3		6016.2	90	601.6
	620	FdCw(Hw) 3307	25	142.4	9.2	E2r, VQO, vets		9.2		1310.1	50	655.0
	79	Fd(Cw) 8415	21	NA	21.8	Park	21.8			NA	Park	0.0
	81	FdCw(Hw) 6405	22	NA	16.0	Park, vets	16.0			NA	Park	0.0
	85	FdHw(DrCw) 5305	21	NA	6.8	Park, vets	6.8			NA	Park	0.0
	88	Fd(HwCw) 9414	19	NA	49.0	Park	49.0			NA	Park	0.0
	258	CwFd(Hw) 6404	21	NA		Park, vets				NA	Park	0.0
	259	CwFD(Hw) 5405	22	NA	↓	Park, vets				NA	Park	0.0
	260	CwDr(Fd) 5406	22	NA	84.4	Park, vets	84.4			NA	Park	0.0
	261	CwFdHw(Dr) 5406	22	NA	54.8	Park, vets	54.8			NA	Park	0.0
	262	FdCw(Hw) 7515	25	NA	7.0	Park, vets	7.0			NA	Park	0.0
	263	FdCw(Hw) 7515	25	NA	10.7	Park, vets	10.7			NA	Park	0.0
	264	FdCw(Hw) 7515	25	NA	10.8	Park, vets	10.8			NA	Park	0.0
	265p	Fd(Cw) 5406	26	NA	4.0	Park, vets	4.0			NA	Park	0.0
	267	Fd 7515	25	NA	7.3	Park, vets	7.3			NA	Park	0.0
	89	Fd(CwHw) 8413	19	NA	27.9	Park	27.9			NA	Park	0.0
	90	FdCw(Hw) 9415	20	NA	9.2	Park	9.2			NA	Park	0.0
	93	FdHw(Cw) 9415	20	NA	14.4	Park	14.4			NA	Park	0.0
	98	CwFd(Hw)7515	23	NA	22.6	park	22.6			NA	Park	0.0
	109	FcCw(Hw)8414	19	NA	26.7	park	26.7			NA	Park	0.0
	111	FdHwCw9416	16	NA	27.6	park	27.6			NA	Park	0.0
	112	FdHwCw9515	21	NA	6.2	park	6.2			NA	Park	0.0

Mapsheet BEC Unit	Polygon	Inventory Label	SI50	m3/ha	ha	Constraints / Comments	Non-Contributing	THLB		total m3	Level of constraint	Impact avail.m3
								constrained	unconstrained			
	113	FdCw(HwPI)8415	23	NA	10.1	park	10.1			NA	Park	0.0
	115	FdCw(Hw)8415	23	NA	26.7	park	26.7			NA	Park	0.0
	123	Fd(Hw)8615	29	NA	12.4	park	12.4			NA	Park	0.0
	477	FdCwHw6504	26	575.8	9.2	Part RMA, wetland, rocky knoll, silv		9.2		5297.4	50	2648.7
	479	FdHw5405	24	386	2.8	Part RMA, rock outcrops, vets		2.8		1080.8	50	540.4
	638	FdCwHw 6404	22	411.9	30.0	Er, VQO, public acces to foreshore		30.0		12357.0	90	1235.7
	629	Fd(PI)9315	14.4	253.7	8.2	NC	8.2					
	260p	FdPI(Hw) 5406	25	333.5	20.4	High wildlife values, rocky, low volume		20.4		6803.4	50	3401.7
	344p	Fd(Hw) 5306	20	517.6	3.0	High wildlife values, rocky, low volume		3.0		1552.8	50	776.4
	656	Fd(HwPI)5405	24	283.5	5.3	High wildlife values, rocky, low volume		5.3		1502.6	50	751.3
	355p	FdHw(Dr) 5505	33	531.5	1.7	High wildlife values, rocky, low volume		1.7		903.6	50	451.8
					885.5			483.1	402.4			
						Non-Contributing ha/ %	483.1	54.6%				
						THLB constrained ha/ %	402.4	45.4%				
						THLB unconstrained ha/%	0	0				
						CWHxm1Totals	885.5	100%				
CWHdm												
92F097	M111	Fd 9		805.0	7.6	TFL 39, steep, VQO			7.6	6118.0	0	6118.0
92F098	94	HwCwFd 9314	10	319.1	24.7	rma/swamp & lake, low SI &M3		24.7		7881.8	90	788.2
	97	HwCwFd 9315	10	339.5	6.6	lake RMA, low SI & M3		6.6		2240.7	90	224.1
	92	HwCwFd 9315	10	339.5	2.7	rma-swamp, low SI & M3		2.7		916.7	90	91.7
	101p	PI(FdCw) 5236	15	53.4	8.5	rma, vets, low SI, NC (PI leading)	8.5			453.9	0	453.9
	89p	FdHwCw 3305	24	224.9	7.2	vets; contiguous with old growth to east, rma		7.2		1619.3	1ha	1394.4
	70p	FdHw(Cw) 3306	27	311.8	1.7	vets; contiguous with old growth to east, rma			1.7	530.1	0	530.1
	91p	FdPI 3207	21	87.9	1.7	vets; contiguous with old growth to east			1.7	149.4	0	149.4
	380p	FdHwCw 5306	25	502.6		rma,vets						
	384p	"	"	502.6		rma,vets, UREP						
	73p	"	"	320		rma,vets, UREP						
	385p	"	"	502.6		rma,vets, UREP						
	72p	"	"	439		rma,vets						
	71p	"	"	387.2		rma,vets						
	87p	"	"	141.7		rma,vets						
	74p	"	"	377		rma,vets						
	75p	"	"	318.7		rma,vets						
	77p	"	"	514.4	63.2	rma,vets, average m3/ha=400.0		63.2		25280.0	16ha	18880.0
	62	HwFd(CyCw) 9315	9	302.6	4.6	Low SI, Low M3, MAMU # 5		4.6		1392.0	75	348.0
	63	HwFd(CyCw) 9315	9	302.6	1.5	Low SI, Low M3, MAMU # 5		1.5		453.9	75	113.5
	11	HwFdCw 9415	11.5	469.3	4.0	low SI, MAMU#5		4.0		1877.2	75	469.3
	12	HwCw 8313	11	324.7	4.7	low SI, MAMU#5		4.7		1526.1	75	381.5
	293	HwFd(CyCw) 9315	9	302.6	73.8	Low SI, Low M3,rma, MAMU # 5		73.8		22331.9	10ha+75%	4826.5
	127	HwFd(Cw) 9315	10	408.1	8.8	low SIMAMU#5		8.8		3591.3	75	897.8
	156	HwCyCwBa9313	9.1	261.4	5.4	NC	5.4					
	125	HwFd(Cw) 9315	10	390.7	3.3	Low SI, Low M3, MAMU # 5		3.3		1289.3	75	322.3
	120	HwFdCw9315	8.2	249.1	10.0	NC	10					

Mapsheet BEC Unit	Polygon	Inventory Label	SI50	m3/ha	ha	Constraints / Comments	Non- Contributing	THLB		total m3	Level of constraint	Impact avail.m3
								constrained	unconstrained			
	104p	HwFd(PI) 5305	15	562.6	8.0	Vets, rocky			8	4500.8	0.0	4500.0
	105	HwFd(Cw) 9415	13	540.5	4.3	MAMU#3			4.3	2324.2	100	0.0
	155	HwFdCw(Ba) 9415	11.5	469.6	3.6	low SI, MAMU#5		3.6		1690.6	100	0.0
92 K007	747	HwFd(Cw) 9415	13	540.2	0.9	MAMU#3			0.9	486.2	100	0.0
	679	HwBaCy 9415	11.5	485.8	1.1	Low SI, MAMU#1		1.1		534.4	100	0.0
	688	HwFdBa 9415	11.5	479.2	3.1	low SI, gulley		3.1		479.2	100	0.0
	686	HwFdCw 6406	20	489.7		vets, gulley						
	657	FdPIHw 5306	21	259.2		vets, gulley						
	685	FdPIHw 5307	21	267.4		vets, gulley						
	683p	FdHw(PICw) 5406	22	398.0		vets, gulley						
	658p	HwFd(Ba) 5305	19	395.1	23.2	vets, gulley, average m3/ha = 375.0		23.2		8700.0	90	870.0
	512	HwFd 9415	13	521.4	6.5				6.5	3389.1	0.0	3389.1
	338	FdHwCw 9515	20	496.8	5.6	VQO, gullied, rocky, steep		5.6		2782.1	50	1391.0
	339	FdHwCw 9515	20	496.9	8.8	VQO, gullied, rocky, steep		8.8		4372.7	50	2186.4
	342	FdHwCw 9415	20	583.0	6.1	VQO, gullied, rocky, steep		6.1		3556.3	50	1778.2
	344	FdHwCw 9515	21	530.1	10.4	VQO, gullied, rocky, steep		10.4		5513.0	50	2756.5
	385	CwBaHw(Cy) 9515	19	768.9	3.2	rma, gulley		3.2		2460.5	1.6ha	1230.2
	393	CwBaHw(Cy) 9515	19	768.9	9.8	gulley, MAMU#10		9.8		7535.2	100	0.0
	230	HwCw(BaFd) 9415	13	499.1	4.0	gulley		4.0		1996.4	100	0.0
	218	FdCw(Hw) 9414	20	544.8	5.3	E2S		5.3		2887.4	40	1732.5
	142p	FdHw 5305	23	385.7	3.6	vets, very rocky - silv.		3.6		1388.5	90	138.9
	153p	FdHw(Cw) 5405	26	557.0	20.8	vets, E2R		20.8		11585.6	50	5792.8
	158p	Fd 9514	22	554.3	8.8				8.8	4877.8	0.0	4877.8
	159	FdHwCw(Dr) 5406	27	490.6	4.8	vets			4.8	2354.9	0.0	2354.9
	33	Fd(CwHw) 9515	20	477.0	10.8	E2S		10.8		5151.6	40	3091.0
	34p	FdHwCw 4406	28	515.4	17.6	vets, E2S		17.6		9071.0	40	5442.6
	35p	Fd(BaHw) 8414	20	583.9	9.2	vets, E2S		9.2		5371.9	40	3223.1
92 K008	94	HwCwFd 9416	14	530.3	6.6	gulley/rma, logged around		6.6		3500.0	100	0.0
	126	HwCwFdBa 9415	11.7	425.4	3.0	low SI, E2s		3.0		1276.2	40	765.7
	97	CwHwFd 9515	21	788.5	8.4	E2s		8.4		6623.4	40	3974.0
	47	CwHw 4303	18	199.6	2.5	Ep, rma		2.5		499.0	90	49.9
	m127a,b,c	HwCw		606	10.4	prev. logged around			10.4	6302.4	0.0	6302.4
	m5701	HwCwCy		728	10.0	lake, rma; prev. logged around		10.0		7280.0	50	3640.0
	m103	CyHwCw		807	5.6	rma/gully		5.6		4519.2	100	0.0
	m5008	HwCwCy		424	5.2	gulley,rma		5.2		2204.8	100	0.0
	m5200	CyHwCw		489	8.4	gulley,rma		8.4		4107.6	100	0.0
	m105	CwCy		527	6	gulley,rma		6		3162.0	100	0.0
92K017	177p	HwCwFd(Dr) 430M7	27	384.4	6.0	rma/swamp		6		2306.4	50	1153.2
92K018	186p	HwCw(Dr) 440M8	25	481.5	1.2	rma		1.2		577.8	50	288.9
	178	HwFdCw(Dr) 640M6	20	453.7	15.2	rma		15.2		6896.2	50	3448.1
	175p	FdHw(Cw) 540M7	25	560.7	19.6	rma		19.6		10989.7	90	1099.0
	129p	FdHw 540M7	29	664.6	3.3	vets, rma/swamp		3.3		2193.2	50	1096.6
	174p	DrFd(CtHC) 320P8	13	32.5	5.4	rma/swamp, NC - Decid. Leading	5.4					
	162	CwHw 430P3	18	199.6	6.8	rma, Ep		6.8		1357.3	90	135.7

Mapsheet							Non-	THLB			Level of	Impact
BEC Unit	Polygon	Inventory Label	SI50	m3/ha	ha	Constraints / Comments	Contributing	constrained	unconstrained	total m3	constraint	avail.m3
	161p	FdHwDrCw 430P7	22	271.5	11.7	rma/swamp/backwater channel		11.7		3176.6	75	794.1
	126	FdHw 520L4	14	111.4	19.6	Vets, DWR value, rocky, Esp, low SI	19.6					
	M130	HwBa 772		772.0	5.2	rma/left after previous logging		5.2		4014.4	100	0.0
	Y1017	HwDrCw		?	3.2	UWR Th01		3.2		?	100	0.0
	Y1016	HwCw.30		?	6.8	UWR Th01		6.8		?	100	0.0
	M133	HwBa-2		772.0	2.8	rma- stream confluence & wetland		2.8		2161.6	75	540.4
	Y1050	Fd 27		?	3.6	UWR Th08B		3.6		?	100	0.0
	69	FdHw(CyDr) 420P6	17	182.1	6.4	Es/UWR Th 01		6.4		1165.4	100	0.0
	71p	HwFdCw540m7	29	606.1	8.0	UWR Th01		8.0		4848.8	50	2424.4
	70	Fd(HwDr) 420P6	18	149.7	6.0	Es/UWR Th01		6.0		898.2	100	0.0
	73p	HwFdCw(Dr) 440M6	25	476.3	12.4	vets, Gully, UWR Th01		12.4		5906.1	100	0.0
	560	HwFd(CyCw)9516	16	710.5	1.7	Es		1.7		1207.9	90	120.8
					630.5							
						Non-contributing ha/ %	48.9	7.8%				
						THLB constrained ha/ %	526.9	83.6%				
						THLB unconstrained ha/%	54.7	8.7%				
						CWHdm Totals	630.5	100.0%				
CWHvm2	99	HwCwFd 9515	15	558.5	3.2	MAMU#3			3.2	1787.2	0	1787.2
92F097	101	Hw(FdBaCy) 9315	9	367.7	10.6	low SI, MAMU#3		10.6		3897.6	75	974.4
92F098	134	HwCy(BaFd)9415	11.5	430.5	2.4	low SI, MAMU#3		2.4		1033.2	75	258.3
92K008	135	HwFd(Ba) 9315	10	420.3	16.0	low SI, MAMU#3		16.0		6724.8	75	1681.2
	136	Hw(FdBa) 9314	9	321.2	24.4	low SI, low M3, MAMU#3		24.4		7837.3	75	1959.3
	139	Hw(BaFd)9415	11.5	472.3	5.6	low SI, MAMU#3		5.6		2644.9	75	661.2
	141	CyHw(Ba) 9315	11	352.5	3.5	low SI, low M3, MAMU#3		3.5		1233.8	75	308.4
	142	Hw(BaFd)9415	11.5	472.3	18.2	low SI, MAMU#3		18.2		8595.9	75	2149.0
	152	HwBa(CyFdCw)9315	10	417.1	17.0	low SI, MAMU#3		17.0		7090.7	75	1772.7
	654p	HwBaCy(Fd)9315	10	391.9	9.8	low SI, low M3, MAMU#3		9.8		3840.6	75	960.2
	689	HwCwFd(BaCy)9515	15	558.5	40.6	MAMU#3			40.6	22675.1	0	22675.1
	690	HwCwCy 9314	10	350.0	49.3	low SI, low M3, MAMU#3		49.3		17255.0	75	4313.8
	691	Hw(BaFd) 9415	11.5	472.0	10.7	low SI, MAMU#3		10.7		5050.4	75	1262.6
	692	HwBaFd 9415	11.5	472.0	6.4	low SI, MAMU#3		6.4		3020.8	75	755.2
	693	Hw(BaFd) 9415	11.5	472.0	54.6	low SI, MAMU#3		54.6		25771.2	75	6442.8
	712	HwCy(FdBa)9415	13	512.1	2.0	MAMU#3			2.0	1024.2	0	1024.2
	100	HwCyBa9314	7.9	237.4	14.1	NC	14.1					
	126	HwBaCy 9313	9.1	297.5	63.3	NC	63.3					
	129	HwBaCy 9322	9.1	286.4	21.9	NC	21.9					
	131	HwBaCy 9322	7.9	117.7	23.0	NC	23.0					
	140	HwCyBa 9314	7.5	221	10.9	NC	10.9					
	146	HwCyBa 9322	7.9	108.9	18.3	NC	18.3					
	156	HwCyCw 9313	9.1	287.7	3.7	NC	3.7					
	641	HwCyCw 9313	8.3	229.9	6.1	NC	6.1					
	23	HwCyBa 9315	8.3	276.3	12.8	NC	12.8					
	43	HwCyFd9316	7.9	275.3	3.6	NC	3.6					

Mapsheet BEC Unit	Polygon	Inventory Label	SI50	m3/ha	ha	Constraints / Comments	Non- Contributing	THLB		total m3	Level of constraint	Impact avail.m3
								constrained	unconstrained			
	11	HwFdCw 9415	11.5	469.3	4.6	low SI, MAMU#5		4.6		2158.8	75	539.7
	12	HwCw 8313	11	324.7	5.7	low SI, low M3, MAMU#5		5.7		1850.8	75	462.7
	125	HwFd(Cw) 9315	10	390.7	12.5	low SI, low M3, MAMU#5		12.5		4883.8	75	1220.9
	128	HwCy 9315	10	382.6	7.7	low SI, low M3, MAMU#5		7.7		2946.0	75	736.5
	127	HwFd(Cw) 9315	10	408.1	22.1	low SI, MAMU#5		22.1		9019.0	75	2254.8
	154	HwCy(FdBa) 9415	11.7	440.4	21.0	low SI, MAMU#5		21.0		9248.4	75	2312.1
	155	HwFdCw(Ba) 9415	11.5	469.6	10.5	low SI, MAMU#5		10.5		4930.8	75	1232.7
	393	CwBaHw(Cy)9515	19	768.9	8.0	Gulley, rma, MAMU #10		8.0		6151.2	100	0.0
	394	CwBaHw(Cy)9514	18	676.5	9.1	Gulley, rma, E2s, MAMU #10		9.1		6156.2	100	0.0
	395	HwCyBa 9415	11.5	449.3	12.3	low SI, MAMU #10		12.3		5526.4	75	1381.6
	396	CyHwBa 9416	12	467.9	3.9	low SI, MAMU #10		3.9		1824.8	75	456.2
	399	HwCyBa 9416	11.5	478.1	1.6	low SI, MAMU #10		1.6		765.0	75	191.2
	405	HwCyBa 9415	11.5	458.8	27.2	low SI, MAMU #10		27.2		12479.4	75	3119.8
	777	HwCyBa 9415	13	548.1	0.6	MAMU #10			0.6	328.9	0	328.9
92K007	529	CyHwBa 9314	12	390.4	22.1	low SI, low m3, MAMU #1		22.1		8627.8	75	2157.0
92K008	530	HwCyBa 9316	11	430.1	8.0	low SI, IFP block 21, MAMU #1		8.0		3440.8	75	860.2
	531	HwCyBa 9415	11.5	444.2	5.5	low SI, MAMU #1		5.5		2443.1	75	610.8
	539	HwCwCyBa 9415	12.3	477.4	9.1	rma, low SI, MAMU #1		1.0	8.1	4344.3	1ha	3866.9
	679	HwBaCy 9415	11.5	485.8	35.6	low SI, MAMU #1		35.6		17294.5	75	4323.6
	528	CyHwBa 9313	11	337.1	27.2	Ep,low SI, low m3, MAMU#1		27.2		9169.1	75	2292.3
	668	HwBaCy 9313	9.1	297.3	6.3	NC	6.3					
	669	HwBa9314	9.1	291.8	9.7	NC	9.7					
	670	HwPIBa 9315	7.9	286.7	17.0	NC	17					
	671	CyHwBa9322	9.4	119.3	18.7	NC	18.7					
	678	HwBaCw 9314	7.9	237	16.5	NC	16.5					
	750	HwCyBa 9314	7.9	237.1	0.7	NC	0.7					
	532	HwCy(Ba) 9415	12.3	488.2	36.4	small wetlands, marginal SI, MAMU #2		36.4		17770.5	100	0.0
	538	HwCwCy(Ba) 9415	13	518.8	40.3	MAMU #2			40.3	20907.6	0	20907.6
	541	HwBaCy 9415	13	580.8	8.0	IFP block 22, MAMU #2			8.0	4646.4	0	4646.4
	540	HwCyBa9314	10	369.0	35.3	Ep, low SI, low m3, MAMU #2		35.3		13025.7	75	3256.4
	545	HwCy(Ba) 9415	13	534.8	59.8	IFP block 22, MAMU #2			59.8	31981.0	0	31981.0
	62	CyHwBa 9414	13.3	460.0	73.8	MAMU#4		73.8		33948.0	75	8487.0
	120	CyHwBa 9315	12	434.8	12.8	low SI, MAMU#4		12.8		5565.4	75	1391.4
	121	HwCyBa 9415	13	543.6	18.5	MAMU#4			18.5	10056.6	0	10056.6
	147	CyHwBa 9313	11	323.1	17.2	Ep,rma, low SI, MAMU#4,		17.2		5557.3	75	1389.3
	150	CyHwBa 9415	15	574.1	2.7	MAMU#4			2.7	1550.1	0	1550.1
	152	HwCyBa 9415	11.5	459.6	4.5	low SI, MAMU#4		4.5		2068.2	75	517.1
	153	HwCY(Ba) 9314	9	317.5	3.9	low SI, low m3, MAMU#4		3.9		1238.3	75	309.6
	406	HwCy(Ba) 9314	9	317.5	2.2	low SI, low m3, MAMU#4		2.2		698.5	75	174.6
	408	CyHwBaCw 9415	15	574.1	7.5	MAMU#4			7.5	4305.8	0	4305.8
	M104	CyHw		510	45.9	MAMU#4		45.9		23409.0	100	0.0
	514	HwBa(CwPIFd)9415	11.5	466.8	23.1	low, SI, MAMU #6		23.1		10783.1	75	2695.8
	519	CyHwBaCw 9315	12	414.1	15.0	low, SI, MAMU #6		15.0		6211.5	75	1552.9
	521	HwCyPI 9315	9	305.0	12.5	low SI, low m3, MAMU #6		12.5		3812.5	75	953.1

Mapsheet BEC Unit	Polygon	Inventory Label	SI50	m3/ha	ha	Constraints / Comments	Non-Contributing	THLB		total m3	Level of constraint	Impact avail.m3
								constrained	unconstrained			
	523	HwCw(BaPIFd)9314	10	336.0	13.6	low SI, low m3, MAMU #6		13.6		4569.6	75	1142.4
	779	HwCyCw 9515	17	712.0	12.0	MAMU #6			12.0	8544.0	0	8544.0
	132	HwBaCy9416	12.3	575.0	1.2	MAMU#8			1.2	690.0	0	690.0
	134	HwBaCy 9415	13	541.8	7.7	MAMU#8			7.7	4171.9	0	4171.9
	129	HwCyBa9414	11	397.6	5.1	low SI, low m3, MAMU#8		5.1		2027.8	75	506.9
	178	HwBaCy9416	11	477.0	3.2	low SI, MAMU#8		3.2		1526.4	75	381.6
	549	HwCyBa9416	11.9	499.7	6.2	low SI, MAMU#8		6.2		3098.1	75	774.5
	553	HwCy(Ba) 9315	10	387.6	4.1	low SI, low m3, MAMU#8		4.1		1589.2	75	397.3
	699	HwBaCy 9415	13	541.8	8.4	MAMU#8			8.4	4551.1		4551.1
	M5202	HwCyBa		590	3.2	MAMU#8		3.2		1888.0	100	0.0
92K017	69	FdHw(CyDr) 420P6	17	182.1	8.0	Es/UWR, vets		8.0		1456.8	100	0.0
92K018	70	Fd(HwDr) 420P6	18	149.7	2.4	Es/UWR, vets		2.4		359.3	100	0.0
	73	HwFdCw(Dr) 440M6	25	476.3	2.4	Gully, UWR, vets		2.4		1143.1	100	0.0
	B	M5244HwBa		872.0	2.4	rma/gulley, logging remnant		2.4		2092.8	100	0.0
	F	M5207HwBa		780.0	4.8	riparian strip in gulley		4.8		3744.0	100	0.0
	H	M327CwHw		266.0	5.6	UWR		5.6		1489.6	100	0.0
	K	M116BaHw		960.0	2.8	rma, cliffs		2.8		2688.0	50	1344.0
	O	M111CyHw		510.0	12.4	UWR, rma		12.4		6324.0	100	0.0
	P	M121HwBa		500.0	3.2	riparian strip		3.2		1600.0	100	0.0
	Q	M5904HwBaCw		737.0	7.6	UWR		7.6		5601.2	100	0.0
	R	M104BaHw		960.0	5.6	riparian strip		5.6		5376.0	100	0.0
	T	M311CyHw		700.0	1.2	UWR		1.2		840.0	100	0.0
	U	M102HwBa		772.0	5.6	UWR		5.6		4323.2	100	0.0
	V	M12HwBa		772.0	4.0	lake rma		4.0		3088.0	50	1544.0
	W	M109HwBa		772.0	2.8	lake rma		2.8		2161.6	80	432.3
	Y	M531BaHwCy		903.0	2.0	UWR		2.0		1806.0	100	0.0
	560	HwFd(CyCw)9516	16	710.6	16.1	Es, DWR values		16.1		11440.7	90	1144.1
	NA	NA	NA	NA	328.7	NC - Not Spatially Defined - within TFL39 "scrub"	328.7					
					1348.2							
						Non-Contributing ha/ %	575.3	34.3%		518797.3		197132.2
						THLB constrained ha/ %	881.0	52.5%				
						THLB unconstrained ha/ %	220.6	13.2%				
						CWHvm2 Totals	1676.9	100.0%				
MHm1	128	HwCyBa 9315	10	377.0	16.1	low SI, low m3, MAMU #8		16.1		6069.7	75	1517.4
92K007	129	HwCyBa 9315	10	397.6	2.5	low SI, low m3, MAMU #8		2.5		994.0	75	248.5
92K008	130	Hw(BaCy) 9416	11	477.1	5.1	low SI, MAMU #8		5.1		2433.2	75	608.3
	131	HwCyBa 9515	10	375.9	14.9	low SI, low m3, MAMU #8, lake rma, wetland		14.9		5600.9	2.5ha + 75	1165.3
	132	HwCyBa 9416	12.3	575.1	3.3	MAMU #8			3.3	1897.8	0	1897.8
	134	HwBaCy 9415	13	541.7	2.6	MAMU #8			2.6	1408.4	0	1408.4
	178	HwBaCy 9416	11	477.0	11.9	low SI, MAMU #8		11.9		5676.3	75	1419.1
	549	HwCyBa 9416	11.9	499.7	11.3	low SI, MAMU #8		11.3		5646.6	75	1411.7
	550	HwCyBa 9414	10	400.0	20.1	low SI, MAMU #8		20.1		8040.0	75	2010.0
	551	HwCyBa 9316	10	377.1	1.8	low SI, low m3, MAMU #8		1.8		678.8	75	169.7

Mapsheet BEC Unit	Polygon	Inventory Label	SI50	m3/ha	ha	Constraints / Comments	Non- Contributing	THLB		total m3	Level of constraint	Impact avail.m3
								constrained	unconstrained			
	552	Hw(BaCy) 9415	11	477.1	11.2	low SI, MAMU #8		11.2		5343.5	75	1335.9
	553	Hw(BaCy) 9416	11	387.6	0.1	low SI, low m3, MAMU #8		0.1		38.8	75	9.7
	700	HwBaCy 9416	11	391.6	2.7	low SI, low m3, MAMU #8		2.7		1057.3	75	264.3
	701	HwCyBa 9314	10	405.1	38.5	low SI, MAMU #8		38.5		15596.4	75	3899.1
	764	HwBaCy 9416	10	400.0	6.6	MAMU #8, lake rma		6.6		2640.0	1ha + 75	560.0
	M116	HwBa	11	772.0	11.4	low SI, MAMU #8		11.4		8800.8	75	2200.2
	M300	HwBa	10	315	3.8	low SI, low m3, MAMU #8		3.8		1197.0	75	299.3
	399	HwCyBa 9416	11.5	478.2	9.2	low SI, MAMU#10		9.2		4399.4	75	1099.9
	396	CyHwBa 9416	12	467.9	6.3	low SI, MAMU#10		6.3		2947.8	75	736.9
	397	CyHwBa 9414	12	427.7	3.8	low SI, MAMU#10		3.8		1625.3	75	406.3
	398	HwCyBa 9415	13	548.1	16.9	MAMU#10, gulley, rma	2.0		14.9	9262.9	2ha	8166.7
	395p	HwCyBa 9415	11.5	449.2	1.2	low SI, MAMU#10		1.2		539.0	75	134.8
	401	CyHwBa 9416	13	507.7	25.4	low SI, MAMU#10		25.4		12895.6	75	3223.9
	405	HwCyBa 9415	11.5	458.8	2.6	low SI, MAMU#10		2.6		1192.9	75	298.2
	404	HwCyBa 9415	12.3	493.6	7.0	MAMU#10			7.0	3455.2	0	3455.2
	400	Hcy(Ba) 9322	7.9	95.5	21.2	NC	21.2					
	M302	HwCy294		294	32.4	NC, MAMU#10	32.4					
	M107	HwCy		564	19.6	MAMU#10			19.6	11054.4	0	11054.4
	402	HwCyBa 9415	11.5	457.8	2.1	low SI, MAMU#10		2.1		961.4	75	240.3
92K017	560	HwFd(CyCw)9516	16	710.5	5.4	Es		5.4		3836.7	90	383.7
92K018	I:M333	H 217		217	2.0	NC, UWR Th06	2.0					
	II:M334	HwCy294		294	15.6	NC, UWR Th06	15.6					
	III:M531	BaHwCy903		903	3.2	UWR Th06		3.2		2889.6	100	0.0
	IV:M5010	HwCyBa661		661	2.8	UWR Th05		2.8		1850.8	100	0.0
	V:M5025	HwBaCy931		931	2.4	UWR Th05		2.4		2234.4	100	0.0
	VI:M323	HwBa 217		217	0.4	NC, UWR Th05	0.4					
	VII: M322	HwBa595		595	4.4	UWR Th05		4.4		2618.0	100	0.0
	VIII:M5029	HwBaCy1103		1103	6.4	UWR Th05		6.4		7059.2	100	0.0
	IX:M5029	HwBaCy1103		1103	5.2	UWR Th05		5.2		5735.6	100	0.0
	X:M5029	HwBaCy1103		1103	2.4	UWR Th05		2.4		2647.2	100	0.0
	XI:M318	HwCyBa245		245	30.0	NC, UWR Th04	30.0					
	XII:M316	HwCyBa217		217	31.2	NC, UWR Th04	31.2					
	XIII:M310	HwBa266		266	10.0	NC, UWR Th02	10.0					
	XIV:M311	CyHw700		700	2.0	UWR Th08A		2.0		1400.0	100	0.0
	XV:M314	Hw375		375	2.6	UWR Th09		2.6		975.0	100	0.0
	NC1:M332	HCy280		280	16.4	NC	16.4					
	NC2:M336	HC245		245	6.4	NC	6.4					
	NC3:M320	H217		217	4.0	NC	4.0					
	NC5:M5301	HCyC206		206	15.6	NC	15.6					
	NC6:M301	HCy224		224	4.4	NC	4.4					
	NC7:M309	HCy224		224	3.2	NC	3.2					
	NC9:M303	HCy252		252	14.4	NC	14.4					
	NC10:M312	H245		245	8.0	NC	8.0					
	NA	NA	NA	NA	373.7	NC - Not Spatially Defined - within TFL39 "scrub"	373.7					

Appendix VI:

Regional Direction Regarding Marbled Murrelet Habitat Management in Landscape Unit Planning



**BRITISH
COLUMBIA**

**Ministry of
Forests**
Vancouver Forest Region

**Ministry of
Environment, Lands and
Parks**

MEMORANDUM

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July 26, 2001

To: All District Managers
Vancouver Forest Region
Ministry of Forests

Regional Fish and Wildlife Managers
Vancouver Island, Lower Mainland, Cariboo and Skeena Regions
Ministry of Environment, Lands and Parks

From: Ken Collingwood, Regional Manager
Vancouver Forest Region

Earl Warnock, Regional Director
Vancouver Island Region

for and behalf of:

Jim McCracken, Regional Director
Lower Mainland Region

Herb Langin, A/Regional Director
Cariboo Region

Jim Yardley, Regional Director
Skeena Region

**Re: Integrating Wildlife Habitat for Marbled Murrelet and Old Growth Management
Areas in Landscape Unit Planning**

With the release of the Landscape Unit Planning Guide on March 25, 1999, landscape unit (LU) planning within the Vancouver Forest Region will commence in the near future. One of the priorities of LU planning is to establish biodiversity objectives for the retention of old growth forests. This will be achieved through the identification and establishment of spatially fixed old growth management areas (OGMAs), consistent with the *Landscape Unit Planning Guide* and the Regional Landscape Unit Planning Strategy. The provincial *Landscape Unit Planning Guide* provides, among other things, a detailed technical reference on how to select, locate and establish OGMAs to meet biodiversity objectives.

While OGMAs are an important element to meet coarse filter biodiversity objectives, they also represent an essential fine filter component under the Identified Wildlife Management Strategy (IWMS). The *Managing Identified Wildlife: Procedures and Measures Volume 1* guidebook recommends that wildlife habitat areas (WHAs) for Marbled Murrelets be established during LU planning, using the OGMA requirements (i.e., overlap OGMAs and Marbled Murrelet WHAs during LU planning). The intent is to ensure that Marbled Murrelet habitat is maintained, to the extent possible, without requiring additional timber supply impacts beyond those associated with meeting biodiversity objectives for old growth retention. The purpose of this memorandum is to provide guidance for the integration of Marbled Murrelet habitat into LU planning.

Marbled Murrelet Considerations in Land Unit Planning

When selecting OGMAs, incorporate the most suitable Marbled Murrelet habitat into OGMAs without increasing impacts on the timber supply or other resources. This should be achieved by utilizing non-contributing and constrained areas, within each LU, prior to impacting the Timber Harvesting Land Base (THLB). The recommended target for Marbled Murrelet habitat protection within each LU is 10 to 12 percent of the combined total area of suitable and originally suitable Marbled Murrelet nesting habitat (described below). However, the total area set aside for Marbled Murrelet cannot exceed the old seral targets in the *Landscape Unit Planning Guide*.

In order to enable informed integration of Marbled Murrelet habitat requirements into LU planning, Ministry of Environment, Lands and Parks (MELP) staff will identify those LUs that are of high priority for Marbled Murrelet conservation and provide information about identified Marbled Murrelet habitat. MELP staff will also review and evaluate the forests in the constrained and non-contributing land base to determine whether they provide sufficient suitable Marbled Murrelet habitat.

Where sufficient currently suitable habitat is not available in constrained and non-contributing areas, and where additional OGMAs can be placed within the THLB, OGMAs should be located in the THLB with a priority consideration for Marbled Murrelet habitat. If there is insufficient old growth in the THLB due to previous harvesting and OGMAs need to be established in younger stands, consider incorporating originally suitable habitats to recruit Marbled Murrelet habitat as part of the decision as to where to locate recruitment OGMAs. Originally suitable habitats are areas that were suitable prior to timber harvesting. Advanced second growth is generally preferred over younger stands.

Where sufficient suitable habitat is not available in constrained and non-contributing areas, and an OGMA allotment does not exist to capture suitable habitat within the THLB, bring this situation to the attention of the rare and endangered species biologist in the appropriate MELP region. A species conservation assessment will be conducted by MELP once all OGMAs have been established in the Vancouver Forest Region, to determine how well the OGMAs have captured suitable Marbled Murrelet habitat requirements.

The best distribution of Marbled Murrelet habitat may conflict with the *Landscape Unit Planning Guide* recommendations for ecosystem representation. When this occurs, the District Manager and Regional Fish and Wildlife Manager must consider whether or not Marbled Murrelet conservation should take precedence over ecosystem representation.

OGMAs that provide sufficient suitable habitat for Marbled Murrelet are appropriate candidates for WHA designation.

Suitable Marbled Murrelet Habitat Description

In general, forest in the Coastal Western Hemlock (CWH), Coastal Douglas-fir (CDF), and Mountain Hemlock (MH) biogeoclimatic zones within 85 km of saltwater in age Class 9 and 8 (structural stage 7) is considered suitable habitat for Marbled Murrelet. When assessing these forests for Marbled Murrelet habitat choose sites most suitable, as indicated below:

- CWH and CDF are preferred over MH;
- in CWH and CDF, tree height classes 5 and 6 are preferred over lesser classes;
- in MH, tree height class 4 is preferred over lesser classes;
- age class 9 is preferred but 8 is acceptable if older forest is not available;
- lower elevations, valley bottoms and lower slopes are preferred;
- large diameter Sitka spruce, Douglas-fir, western hemlock and amabilis fir are important in low elevation sites;
- large diameter yellow-cedar, mountain hemlock and amabilis fir are important at high elevation sites;
- sites closer to saltwater are preferred (i.e., within 30 km is optimum);
- larger contiguous areas are preferred over smaller contiguous area and fragmented areas;
- maximize interior forest conditions to minimize predation: areas should be ≥ 200 ha and ≥ 600 m in width [in the absence of large patches of old-growth forest, smaller areas with ideal habitat will support Marbled Murrelets, but these areas should be buffered with 100 m of mature or advanced second growth forest (> 60 years), and, no more than 50 percent of the area's boundary should be exposed to early seral stages (<40 years)]; and
- windfirm boundaries should also be considered.

In addition, the presence of the following features is preferred:

- large limbs higher than 15 m above the ground with platforms >18 cm across;
- potential nest platforms and moss covered branches;
- Sitka spruce, Douglas-fir, western hemlock, western red cedar >50 m in height; and
- yellow-cedar and mountain hemlock >30 m in height (if above tree species are unavailable).

If you have any questions concerning this information, please contact the following:
Don Heppner, Forest Entomologist, Vancouver Forest Region (250-751-7107); or the
Rare and Endangered Species Biologist, in the appropriate MELP Region.

Ken Collingwood
Regional Manager
Vancouver Forest Region
Ministry of Forests

Earl Warnock
Regional Director
Vancouver Island Region
Ministry of Environment, Lands and Parks

for and behalf of:

Jim McCracken, Regional Director
Lower Mainland Region

Herb Langin, A/Regional Director
Cariboo Region

Jim Yardley, Regional Director
Skeena Region