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**FOREST STEWARDSHIP PLAN
SUPPORTING INFORMATION DOCUMENT**

FOR

**FOREST LICENSE (FL) A75657
NON-REPLACEABLE FOREST LICENCE (NRFL) A79507
NON-REPLACEABLE FOREST LICENCE (NRFL) A96396
NON-REPLACEABLE FOREST LICENSE (NRFL) A81096
NON-REPLACEABLE FOREST LICENSE (NRFL) A96967
NON-REPLACEABLE FOREST LICENSE (NRFL) AXXXX – UNISSUED**

Chilliwack Natural Resource District / Fraser TSA

Prepared By



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Purpose of the Supporting Information Document

The British Columbia government put into effect the *Forest and Range Practices Act* (FRPA) and the associated regulations, which is a results-based framework that maintains high environmental standards that are expected by the public. It encourages innovation by skilled resource professionals and holds licensees responsible for the outcomes that result from forest management and primary forest activities. The regulations require a license/agreement holder to prepare a Forest Stewardship Plan that is consistent with resource management objectives that have been established by government.

The Forest Stewardship Plan (FSP) is a landscape level plan, which is focused on establishing results, strategies and measures for conserving and/or protecting timber and non-timber resource values associated with forest management activities. The FSP states measurable and enforceable results, strategies and/or measures that must be consistent with objectives set by government for a variety of forest values (e.g. fisheries, wildlife, water, biodiversity, cultural values, visuals, recreation, etc.). Forest licensees work in cooperation with government agencies, First Nations, various stakeholders and the general public to ensure that the provincial government's objectives for the management, protection and conservation of forest resources are achieved.

The purpose of the Forest Stewardship Plan Supporting Information Document is to provide interpretive information and background documentation to First Nations and the general public. As such, this document accompanies and is consistent with the Forest Stewardship Plan, but is not part of the Forest Stewardship Plan.

1.0 Introduction

The introduction in the FSP states that the Plan Holders prepared the document in order to meet all of the legislative requirements expressed in the *Forest and Range Practices Act* and the *Forest Planning and Practices Regulation*. Also described in this section are the licensees that are the holders of the FSP.

1.1 Definitions and Abbreviations

This section defines a number of abbreviations used throughout the FSP document.

1.2 Forest Stewardship Plan

The Forest Stewardship Plan (FSP) is a requirement under Section 3 of the *Forest and Range Practices Act* (FRPA), which came into effect on January 31, 2004. This FSP has been drafted to be consistent and in accordance with the FRPA, the associated regulatory framework, provincial legislation, federal legislation as well as higher level plans and policy as described by the British Columbia Provincial Government.

The purpose of the FSP is to outline objectives set forth by the Government of British Columbia related to forest management activities proposed on crown lands. The achievement of the objectives, established within the FSP, is measured through results, strategies and/or measures. The intention of the objectives is to identify the strategic issues by describing a desired future condition for a particular resource or resource use, while results, strategies and/or measures describe how the desired outcome will be achieved.

A result is defined in the FPPR as a “description of measurable or verifiable outcomes in respect of a particular established objective, and the situations or circumstances that determine where in a Forest Development Unit the outcomes will be applied.” A strategy is defined in the FPPR as a “description of measurable or verifiable steps or practices that will be carried out in respect of a particular established objective, and the situations or circumstances that determine where in a Forest Development Unit the steps or practices will be applied.” This FSP, where applicable, embraces and outlines measurable and verifiable results, strategies and/or measures that are compatible with government established forest management and resource objectives.

1.3 Forest Development Units

The Forest Development Units (FDU) identified within the FSP are described in the FRPA simply as (a) where forest development may occur during the term of the plan, and (b) within which, during the term of the plan, timber to be harvested or roads to be constructed are entirely located. A FDU is the broad geographic location to which a common set of objectives, results, strategies and/or measures are applicable. The FSP Maps and the Overview Map show the location of the FDU’s relevant to the FSP.

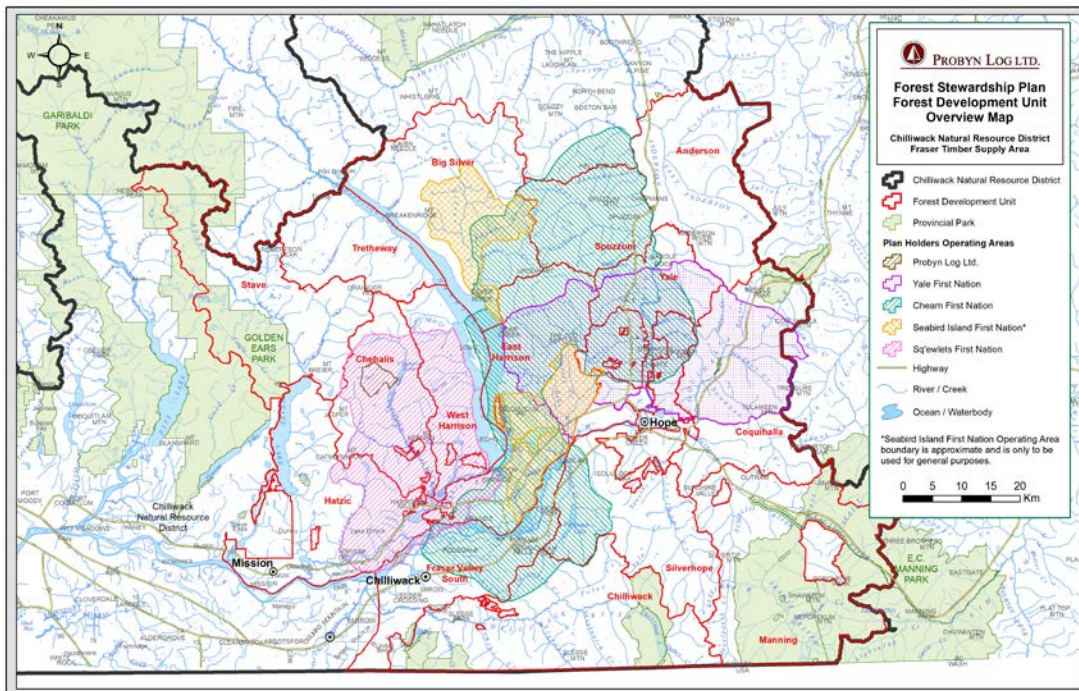


Figure 1. Forest Stewardship Plan Overview Map Outlining the Geographic Location of the Forest Development Units and the Plan Holder’s assigned Operating Areas.

1.4 Professional Reliance and Accountability

Qualified resource professionals have a number of important roles and responsibilities to fulfill while conducting forestry management on public forest lands. A professional designation or title is given to an individual who has met criteria and registration requirements defined by a particular association. These criteria and requirements can include post-secondary education, competency requirements, articling periods as well as examinations. For example, the *Foresters Act* governs the Association of British Columbia Forest Professionals (ABCFP). The ABCFP is responsible for protecting the public interest in the practice of professional forestry by ensuring competency, independence, professional conduct as well as the integrity of its members. The association holds those practicing professional forestry accountable. In addition to the ABCFP, there are a number of other professional associations including the Association of Professional Biologists (APB) and the Engineers and Geoscientists of British Columbia (EGBC) that have a role in the management of public forested land. Individuals registered with the APB and the EGBC often work closely and cooperatively with professional foresters when planning and prescribing forest management activities.

With the introduction of the FRPA, the Government of British Columbia mandated a move away from a regulatory and prescriptive environment to one that supports a results-based regime. This results-based regime involves a greater role for professionals from a variety of disciplines in regards to professional reliance and accountability. The Plan Holders recognizes the importance of professional reliance and accountability, and will endeavor to employ qualified professionals, in their respective fields of practice, where applicable and warranted. Although FRPA is silent on the use of professionals, the engagement of the qualified professionals will primarily take place during the preparation of site specific operational plans, and supporting assessments, in order to provide a suitable level of due diligence in conducting forestry activities.

1.5 Forest Development Plan (FDP) Blocks and Declared Areas

This section of the FSP states that the Plan Holders do not have any FRPA Section 196(1) cutblocks and/or roads that were developed under the *Forest Practices Code of British Columbia Act* and identified within a Forest Development Plan.

1.6 Site Plans and Standard Units

As described in Section 10 of the FRPA and Section 34 of the FPPR, the holder of a FSP must prepare a Site Plan in accordance with the prescribed requirements for any cut block and road prior to the commencement of timber harvesting or road construction. The purpose of the Site Plan document is to identify the approximate location of the cut block(s) and road(s), must be consistent with the FSP, FRPA and the regulations, and describe how the results and strategies contained within the FSP apply to the area. The Site Plan must also outline the standard units for the area, the soil disturbance limits, and the stocking standards required to establish a free growing stand.

Although approval from government agencies is not required, the Site Plan is the basic operational plan that encompasses and balances all resource features and values. Standard units within the Site Plan indicate areas that generally possess uniformity in ecological characteristics, and result in similar silviculture management through the application of a stocking standard.

1.7 Stocking Standards

Section 16 of the FPPR states a person preparing a FSP must ensure that the plan specifies where and, situations or circumstances, when a stocking standard will apply to an area.

Stocking standards are the standards developed by the Plan Holders, and approved by government, that facilitate the establishment of a free growing stand as required under Section 44 of the FPPR within standard units described in the Site Plan. Therefore, stocking standards act to link the Site Plan to the FSP and set out the legal objectives to be met by the Plan Holders on areas subject to timber harvesting. The situations and the circumstances in which they will be applied are governed by the location of the opening within a biogeoclimatic zone, subzone, variant and site series. The stocking standards provided in Appendix 2 are applicable to the FDU's described in this FSP.

The majority of these stocking standards are intended to address even-aged silviculture systems and forest management activities, while one has been developed to engage in uneven-aged management or the forest management activities listed in Section 44(3)(h) of the FPPR. For reference, a detailed rationale and supporting information document has been included in Appendix 2 of the Forest Stewardship Plan.

Additionally, the Plan Holders have provided Single Entry Dispersed Retention Stocking Standards (SEDRSS) in Appendix 2. SEDRSS apply to cutblocks where a qualified professional has prescribed a Single Entry Dispersed Retention Silviculture System where the post-harvest basal area falls between 5m²/ha and less than 40m²/ha, and the retention trees are intended to contribute towards a regeneration and free growing obligation. The application of a Single Entry Dispersed Retention Silviculture System will achieve one or more of the following non-timber objectives:

- to ensure slope stability and the protection of soils;
- to ensure the protection of water, fish, wildlife and biodiversity within riparian areas;
- to protect water in a community watershed;
- to maintain or enhance wildlife and biodiversity at the stand and landscape levels;
- to meet a visual quality objective;
- to protect cultural heritage resources; or
- to protect the wildland urban interface or high value infrastructure or high resource values as identified in an approved district fire management plan.

The Plan Holders will implement the damage criteria and survey methodologies indicated in the following publications:

- Single Entry Dispersed Retention Stocking Standard Framework Implementation Guide (Coast Region FRPA Implementation Team September 14, 2011.)
- Appendix 3: Coastal Second Growth Douglas–fir (Fdc) Retention Stocking Standard SEDRSS – Fdc (August 3, 2016)

Single Entry Dispersed Retention Harvesting is limited as follows:

- A maximum of 2,300 m³ or approximately 10% of the five year sum of allowable annual cuts measured at the end of a five year cut control period for FL A75657.
- A maximum of 2,100 m³ or approximately 10% of the five year sum of allowable annual cuts measured at the end of a five year cut control period for NRFL A79507.
- A maximum of 6,400 m³ or approximately 10% of the five year sum of allowable annual cuts measured at the end of a five year cut control period for NRFL A96396.
- A maximum of 10,700 m³ or approximately 10% of the five year sum of allowable annual cuts measured at the end of a five year cut control period for NRFL A81096.
- A maximum of 3,400 m³ or approximately 10% of the five year sum of allowable annual cuts measured at the end of a five year cut control period for NRFL A96967.
- A maximum of approximately 10% of the five year sum of the allowable annual cuts measured at the end of a five year cut control period for the unissued NRFL AXXXX.

1.8 Cumulative Effect of Multiple and Overlapping Forest Stewardship Plans

This section of the FSP states that the Plan Holders will endeavor to work proactively and cooperatively with other forest tenure holders whose FSP's identify FDU's that overlap or are immediately adjacent to the ones described in the FSP. This point is important in ensuring that forestry resource values such as visual quality objectives, community watershed resource values or wildlife management objectives are managed cooperatively and appropriately when multiple forest tenure holders are planning forest development activities in a similar geographic area.

1.9 Notice of Review and Comment

As required under Section 20 and 21 of the FPPR, potentially affected stake holders, interested parties and the general public were made aware that the FSP was available for review and comment through an advertisement placed in the Agassiz-Harrison Observer, Chilliwack Progress and the Hope Standard. The advertisement provided notice and informed the public that the FSP was made available for review and comment at Chartwell Resource Group Ltd.'s office in North Vancouver, BC and on the following website www.crgl.ca/Probyn-FSP throughout the required review period.

Referral letters were also sent out to potentially affected stakeholders and interested parties, including Government Agencies, First Nations, Forest Tenure Holders, Special Interest Groups, Commercial Recreation Groups, Guide Outfitters and Trappers as required under Section 21 of the FPPR. These letters informed the potentially affected stakeholders and interested parties that the FSP was made available for review at Chartwell Resource Group Ltd.'s office in North Vancouver, BC and on the following website www.crgl.ca/Probyn-FSP throughout the required review period.

Once received, as per Section 22 of the FPPR, the comments provided by the public, potentially affected stakeholders, First Nations, and Government Agencies, as a result of this review, were considered prior to the preparation of the final submission to the Ministry of Forests.

1.10 Section 14(3) Orders and Dates

This section of the FSP provides a table that details all of the Orders, the FDU's in which they occur as well as the associated approval/designation dates that are applicable to the FDU's outlined in the FSP.

2.0 Forest Resource Management Objectives, Results, Strategies and Measures

This section of the FSP outlines the broad forest resource management goals and objectives as described through higher level plans, objectives set by government and objectives in addition to those established by government. In addition to describing the forest management objectives, this section provides a number of results, strategies, measures and/or comments that will be implemented and used to measure and/or verify the successful achievement of the objectives to which they pertain.

2.1 Higher Level Plans

The Anderson, Big Silver, Chehalis, Chilliwack, Coquihalla, East Harrison, Fraser Valley South, Hatzic, Manning, Silverhope, Spuzzum, Stave, Tretheway, West Harrison and Yale Landscape Unit Plans are the higher level plans applicable to the FDU's under the FSP.

In the Chilliwack Natural Resource District, the Anderson, Big Silver, Chehalis, Chilliwack, Coquihalla, East Harrison, Manning, Silverhope, Spuzzum, Tretheway, West Harrison and Yale Landscape Units were established pursuant to Section 4 of the *Forest Practices Code of British Columbia Act*. The Orders to establish these Landscape Unit Plans specify the objectives related to Old Growth Management Areas and Wildlife Tree Patches, which are also referred to as Wildlife Tree Retention Areas in the legal objectives. Objective #1 relates to Old Growth Management Areas, while Objective #2 relates to Wildlife Tree Patch retention requirements. These Orders and the legal objectives can be found in Appendix #1. Even though these Orders were established under older legislation, the objectives defined in the Landscape Unit Plans became continued under the FRPA.

In the Chilliwack Natural Resource District, the Fraser Valley South, Hatzic and Stave Landscape Units were established pursuant to Section 93.4 of the Land Act. This Order specified the objectives related to Old Growth Management Areas, but unlike the Orders established under Section 4 of the *Forest Practices Code of British Columbia Act*, it does not specify objectives related to Wildlife Tree Patches. Therefore, the amount of area required for Wildlife Tree Patches or Wildlife Tree Retention Areas to be retained is described in Section 2.2.8 of the FSP. These Orders and the legal objectives can be found in Appendix #1.

2.2 Objectives Set by Government

Section 149 (1) of the FRPA describes objectives set by government with respect to forest management activities on crown lands. Specifically, this section states “The Lieutenant Governor in Council may make regulations prescribing objectives in relation to one or more of the following subjects: (a) soils; (b) visual quality; (c) timber; (d) forage and associated plant communities; (e) water; (f) fish; (g) wildlife; (h) biodiversity; (i) recreation resources; (j) resource features and (k) cultural heritage resources”.

The following sections of this FSP detail the objectives set by government with specific reference to those described in the FPPR, as well as specify, where applicable, the associated results and/or strategies.

2.2.1 Soils

As stated in the FSP, the objective set by government for soils is, without unduly reducing the supply of timber from British Columbia’s forests, to conserve the productivity and the hydrologic function of soils. However, Section 12.1 of the FPPR states a person required to prepare a forest stewardship plan is exempt from the requirement to prepare a result or strategy if the person undertakes to comply with Sections 35 (Soil Disturbance Limits) and 36 (Permanent Access Structure Limits) of the FPPR.

In order to meet the objective related to Section 35 – Soil Disturbance Limits, the Plan Holders will adopt the default practice requirements, which includes not exceeding a maximum of 5% of the net area to be reforested for sensitive soils, 10% of the net area to be reforested for non-sensitive soils and 25% for roadside work areas where decking, processing, loading, piling or disposing of logging debris are carried out. For the purposes of this section, soil disturbance is characterized as areas occupied by trails, compacted areas, areas of dispersed disturbance (ruts and gouges) and temporary trails that have not been rehabilitated.

In order to meet the objective related to Section 36 – Permanent Access Structure Limits, the Plan Holders will adopt the default practice requirement, which includes not exceeding a maximum of 7% of the net area to be reforested unless an acceptable rationale is provided, which are outlined in Section 36(1)(a) and (b) of the FPPR. Where the limit is exceeded, without rationale or justification, rehabilitation is required.

Additionally, forest tenure/agreement holders must meet practice requirements regarding soil conservation as outlined in Section 37 to 40 of the FPPR. These sections specify that primary forest activities must not cause landslides or gully processes, that natural surface drainage patterns are maintained, and exposed soil is revegetated if there is the potential for sedimentation or erosion.

2.2.2 Timber

As stated in the FSP, the objectives set by government for timber are to (a) maintain or enhance an economically valuable supply of commercial timber from British Columbia's forests, (b) ensure that delivered wood costs, generally, after taking into account the effect on them of the relevant provisions of this regulation and of the Act, are competitive in relation to equivalent costs in relation to regulated primary forest activities in other jurisdictions, and (c) ensure that the provisions of this regulation and of the Act that pertain to primary forest activities do not unduly constrain the ability of a holder of an agreement under the Forest Act to exercise the holder's rights under the agreement. However, Section 12(8) of the FPPR states that a person who is required to prepare a forest stewardship plan is exempt from the requirement to prepare results or strategies for an objective set by government for timber.

2.2.3 Wildlife

As stated in the FSP, the objective set by government for wildlife is, without unduly reducing the supply of timber from British Columbia's forests, to conserve sufficient wildlife habitat in terms of amount of area, distribution of areas and attributes of those areas, for (a) the survival of species at risk; (b) the survival of regionally important wildlife, and (c) the winter survival of specified ungulate species.

A person who prepares a FSP is required to develop a result or strategy that meets this objective for identified species. A species is considered identified when the government provides a 'Notice' for that species including the amount, distribution and attributes of wildlife habitat required. The person preparing a FSP may be exempt from writing a result or strategy if the objective is met through the designation and approval of a Wildlife Habitat Area, Ungulate Winter Range, General Wildlife Measure or Wildlife Habitat Feature that satisfies the 'Notice' requirements.

On December 21, 2004, a Notice - Indicators of the Amount, Distribution and Attributes of Wildlife Habitat Required for the Survival of Species at Risk in the Chilliwack Forest District (Amended in 2007, 2009 and 2010), and a Notice - Indicators of the Amount, Distribution and Attributes of Wildlife Habitat Required for the Winter Survival of Ungulate Species in the Fraser Timber Supply Area were issued. Refer to Appendix #2.

On December 2, 2021, an Order for the Recovery of Marbled Murrelet, and a Notice – Indicators of the Amount, Distribution and Attributes of Wildlife Habitat Required for the survival of Marbled Murrelet were issued.

The following provides a description of the Survival of Species at Risk in the Chilliwack Natural Resource District.

2.2.3.1 Pacific (Coastal) Giant Salamander

With respect to the Notice – Indicators of the Amount, Distribution and Attributes of Wildlife Habitat Required for the Survival of Species at Risk in the Chilliwack Forest District (August 3, 2007) for the Pacific Giant Salamander, the Plan Holders will manage the applicable and approved Wildlife Habitat Areas described in the Order – Wildlife Habitat Areas #2-120 to #2-128, #2-130 to #2-138, #2-148 and #2-149 Pacific Giant Salamander – Chilliwack Forest District (August 24, 2007) and the Order – Wildlife Habitat Areas #2-580 to #2-587, #2-589 to #2-592, #2-594, #2-595, #2-656 to #2-661 and #2-663 to #2-666 Pacific Giant Salamander – Chilliwack Forest District (August 21, 2017). Refer to Appendix #2a.

Additionally, the Order – Wildlife Habitat Areas #2-120 to #2-128, #2-130 to #2-138, #2-148 and #2-149 Pacific Giant Salamander – Chilliwack Forest District (August 24, 2007) states that, ‘pursuant to Section 7(3) of the *Forest Planning and Practices Regulation*, the person(s) required to prepare a Forest Stewardship Plan are hereby exempted from the obligation to prepare results or strategies in relation to the objective set out in Section 7(1) of the *Forest Planning and Practices Regulation* for Pacific (Coastal) Giant Salamander in the Notice for the Chilliwack Forest District’. Therefore, the Notice requirements have been met and are considered to no longer be in effect.

Where an occurrence of Pacific Giant Salamander is observed, within the FDU’s identified in the FSP, that is not located within an approved Wildlife Habitat Area, the Plan Holders will reference the Accounts and Measures for Managing Identified Wildlife – Coast Forest Region for the Pacific Giant Salamander (Appendix #2a), and/or may engage the services of a qualified professional, in developing a suitable management strategy.

2.2.3.2 Grizzly Bear

With respect to the Notice – Indicators of the Amount, Distribution and Attributes of Wildlife Habitat Required for the Survival of Species at Risk in the Chilliwack Forest District (August 3, 2007) for the Grizzly Bear, the Plan Holders will manage the applicable and approved Wildlife Habitat Areas according to the General Wildlife Measures described in the Order – Wildlife Habitat Areas #2-099, 2-100, 2-101, 2-102 & 2-194 (March 17, 2005), the Order – Wildlife Habitat Areas #2-109, 2-112, 2-114, 2-118,

2-119, 2-195, 2-196, 2-197, 2-198, 2-199, 2-201, 2-202 & 2-203 (March 17, 2005), the Order – Wildlife Habitat Areas #2-097, 2-098, 2-105 to 2-107, 2-111, 2-113, 2-116 and 2-372 to 2-380 Grizzly Bear – Chilliwack Forest District (September 16, 2010) and the Order – Wildlife Habitat Areas #2-407 to 2-434 Grizzly Bear – Chilliwack Forest District (March 8, 2011). Refer to Appendix #2b.

Additionally, the Order – Wildlife Habitat Areas #2-407 to 2-434 Grizzly Bear – Chilliwack Forest District (March 8, 2011) states that, ‘pursuant to Section 7(3) of the *Forest Planning and Practices Regulation*, the person(s) required to prepare a Forest Stewardship Plan are hereby exempted from the obligation to prepare results or strategies in relation to the objective set out in Section 7(1) of the *Forest Planning and Practices Regulation* for Grizzly Bear in the Chilliwack Forest District’. Therefore, the Notice requirements have been met and are considered to no longer be in effect.

2.2.3.3 Pacific Water Shrew

With respect to the Notice – Indicators of the Amount, Distribution and Attributes of Wildlife Habitat Required for the Survival of Species at Risk in the Chilliwack Forest District (August 3, 2007) for the Pacific Water Shrew, the Plan Holders will manage the applicable and approved Wildlife Habitat Areas described in the Order – Wildlife Habitat Areas #2-514, #2-515 and #2-667 to #2-669 Pacific Water Shrew – Chilliwack Forest District (August 21, 2017). Refer to Appendix #2c.

Additionally, the Order – Wildlife Habitat Areas #2-514, #2-515 and #2-667 to #2-669 Pacific Water Shrew – Chilliwack Forest District (August 21, 2017) states that, ‘pursuant to Section 7(3) of the *Forest Planning and Practices Regulation*, the person(s) required to prepare a Forest Stewardship Plan are hereby exempted from the obligation to prepare results or strategies in relation to the objective set out in Section 7(1) of the *Forest Planning and Practices Regulation* for Pacific Water Shrew in the Notice for the Chilliwack Forest District’. Therefore, the Notice requirements have been met and are considered to no longer be in effect.

Where an occurrence of Pacific Water Shrew is observed, within the FDU’s identified in the FSP, that is not located within an approved Wildlife Habitat Area, the Plan Holders will reference the Accounts and Measures for Managing Identified Wildlife – Coast Forest Region for the Pacific Water Shrew (Appendix #2c), and/or may engage the services of a qualified professional, in developing a suitable management strategy.

2.2.3.4 Tall Bugbane

With respect to the Notice – Indicators of the Amount, Distribution and Attributes of Wildlife Habitat Required for the Survival of Species at Risk in the Chilliwack Forest District (August 3, 2007) for the Tall Bugbane, the Plan Holders will manage the applicable and approved Wildlife Habitat Areas described in the Order – Wildlife Habitat Areas #2-129, #2-139, #2-141 to #2-143, #2-145 and #2-146 Tall Bugbane – Chilliwack Forest District (August 24, 2007) and the Order – Wildlife Habitat Areas #2-567 to #2-579 and #2-670 Tall Bugbane – Chilliwack Forest District (August 21, 2017). Refer to Appendix #2d.

Additionally, the Order – Wildlife Habitat Areas #2-129, #2-139, #2-141 to #2-143, #2-145 and #2-146 Tall Bugbane – Chilliwack Forest District (August 24, 2007) states that, ‘pursuant to Section 7(3) of the *Forest Planning and Practices Regulation*, the person(s) required to prepare a Forest Stewardship Plan are hereby exempted from the obligation to prepare results or strategies in relation to the objective set out in Section 7(1) of the *Forest Planning and Practices Regulation* for Tall Bugbane in the Notice for the Chilliwack Forest District’. Therefore, the Notice requirements have been met and are considered to no longer be in effect.

Where an occurrence of Tall Bugbane is observed, within the FDU’s identified in the FSP, that is not located within an approved Wildlife Habitat Area, the Plan Holders will reference the Accounts and Measures for Managing Identified Wildlife – Coast Forest Region for the Tall Bugbane (Appendix #2d), and/or may engage the services of a qualified professional, in developing a suitable management strategy.

2.2.3.5 Pacific (Coastal) Tailed Frog

Although not located within the FDU’s identified in the FSP, and with respect to the Notice – Indicators of the Amount, Distribution and Attributes of Wildlife Habitat Required for the Survival of Species at Risk in the Chilliwack Forest District (August 3, 2007) for the Pacific (Coastal) Tailed Frog, the Plan Holders recognize the approved Wildlife Habitat Areas described in the Order – Wildlife Habitat Areas #2-511 to #2-513 (April 1, 2014). Refer to Appendix #2e.

Additionally, the Order – Wildlife Habitat Areas #2-511 to #2-513 (April 1, 2014) states that, ‘pursuant to Section 7(3) of the *Forest Planning and Practices Regulation*, a person required to prepare a Forest Stewardship Plan is exempt from the obligation to prepare results or strategies in relation to the objective set out in Section 7(1) of the *Forest Planning and Practices Regulation* for Pacific Tailed Frog in the Chilliwack Natural Resource District’. Therefore, the Notice requirements have been met and are considered to no longer be in effect.

Where an occurrence of Pacific (Coastal) Tailed Frog is observed, within the FDU's identified in the FSP, that is not located within an approved Wildlife Habitat Area, the Plan Holders will reference the Accounts and Measures for Managing Identified Wildlife – Coast Forest Region for the Pacific (Coastal) Tailed Frog (Appendix #2e), and/or may engage the services of a qualified professional, in developing a suitable management strategy.

2.2.3.6 Spotted Owl

With respect to the Notice – Indicators of the Amount, Distribution and Attributes of Wildlife Habitat Required for the Survival of Species at Risk in the Chilliwack Forest District for the Spotted Owl, the Plan Holders will manage the applicable approved Wildlife Habitat Areas according to the General Wildlife Measures described in the Order – Wildlife Habitat Areas #2-494 to #2-510 (March 1, 2011). Refer to Appendix #2f.

Additionally, the Order states that, 'pursuant to Section 7(3) of the *Forest Planning and Practices Regulation*, a person required to prepare a Forest Stewardship Plan is exempt from the obligation to prepare results or strategies in relation to the objective set out in Section 7(1) of the *Forest Planning and Practices Regulation* for Spotted Owl in the Chilliwack Forest District'. Therefore, the Notice requirements have been met and are considered to no longer be in effect.

2.2.3.7 Northern Goshawk

On February 13, 2019 the District Manager issued a letter, as well as suitability nesting habitat maps, to all forest tenure holders within the Chilliwack Natural Resource District regarding the management and protection of breeding and nesting habitat for the Northern Goshawk. Refer to Appendix #2j. The letter generally explains the expectations of the Ministry of Forests, and the short and long term targets to protect Northern Goshawk breeding habitat. The Plan Holders, during pre-harvest planning and field engineering, will:

- Refer to the habitat suitability maps to determine the suitability class of the habitat proposed for timber harvesting.
- Conduct a field inspection to confirm the stand attributes are in keeping with the suitability class mapping during field engineering.
- Conduct a field inspection for Northern Goshawk presence, activity, sign or nests during field engineering.
- Engage the services of a qualified professional if presence, activity, sign or nests are observed to complete an assessment and provide recommendations related to maintenance and protection of suitable Northern Goshawk breeding and nesting habitat.

With respect of the Order – Wildlife Habitat Area #2-671 (May 22, 2020) and the Order of the Minister of Land, Water and Resource Stewardship – Wildlife Habitat Area #2-696 & 2-697 (October 4, 2022), the Plan Holders will manage the applicable approved Wildlife Habitat Area according to the General Wildlife Measures described in the Orders. Refer to Appendix 2g.

2.2.3.8 Marbled Murrelet

The results and strategies for Marbled Murrelet are included in the Forest Stewardship Plan for both the Order for the Recovery of Marbled Murrelet (*Brachyramphus marmoatus*) and the Notice – Indicators of the Amount, Distribution and Attributes of Wildlife Habitat Required for the Survival of Marbled Murrelet (*Brachyramphus marmoatus*), which became effective on December 2, 2021. Refer to Appendix 2h.

The intent of the Order is to ensure enough Suitable Habitat is retained to meet the Minimum Suitable Habitat requirements in the Notice. Wildlife Habitat Areas (WHA) for Marbled Murrelet and additional Old Growth Management Areas (OGMA) will be identified using Schedule 1 of the Notice, which defines the Amount, Distribution and Attributes. Once WHA's and OGMA's have been identified and agreed upon by government, forest tenure holders, First Nations and other stakeholders, subsequent Orders will be issued by the government for each Landscape Unit in the Chilliwack Natural Resource District to legally adopt the new Marbled Murrelet WHA's and the additional OGMA's. These new Orders will effectively replace the Order and Notice of December 2, 2021, which will be rescinded at that time.

2.2.3.9 Survival of Regionally Important Wildlife

The government may designate one or more categories of wildlife as regionally important wildlife where the species are important to a region of British Columbia and may be adversely impacted by forest and range practices. As of the date of the FSP, there are no designated regionally important species in the FDU's outlined in the FSP.

The following provides a description of the Winter Survival of Ungulate Species in the Fraser Timber Supply Area.

2.2.3.10 Mountain Goat

With respect to the Notice – Indicators of the Amount, Distribution and Attributes of Wildlife Habitat Required for the Winter Survival of Ungulate Species in the Fraser Timber Supply Area for the Mountain Goat, the Plan Holders will manage the applicable Ungulate Winter Ranges according to the General Wildlife Measures described in the Order – Ungulate Winter Range #U-2-001 Fraser TSA Mountain Goat (March 10, 2008). Refer to Appendix #2i.

Additionally, the Order states that, 'pursuant to Section 7(3) of the *Forest Planning and Practices Regulation*, a person required to prepare a Forest Stewardship Plan is exempt from the obligation to prepare results or strategies in relation to the objective set out in Section 7(1) of the *Forest Planning and Practices Regulation* for winter survival of mountain goat in the Fraser TSA'. Therefore, the Notice requirements have been met and are considered to no longer be in effect.

2.2.3.11 Black-tailed Deer and Mule Deer

With respect to the Notice – Indicators of the Amount, Distribution and Attributes of Wildlife Habitat Required for the Winter Survival of Ungulate Species in the Fraser Timber Supply Area for the Black-tailed and Mule Deer, the Plan Holders will manage the applicable Ungulate Winter Ranges according to the General Wildlife Measures described in the Order – Ungulate Winter Range #U-2-006 (September 22, 2009). Refer to Appendix #2j.

Additionally, the Order states that, 'pursuant to Section 7(3) of the *Forest Planning and Practices Regulation*, a person required to prepare a Forest Stewardship Plan is exempt from the obligation to prepare results or strategies in relation to the objective set out in Section 7(1) of the *Forest Planning and Practices Regulation* for deer winter range in the Fraser TSA'. Therefore, the Notice requirements have been met and are considered to no longer be in effect.

2.2.3.12 Mountain Beaver

Although not described as an identified wildlife species, the Plan Holders will manage the applicable and approved Wildlife Habitat Area described in the Order – Wildlife Habitat Area #2-012 (September 13, 2001) for Mountain Beaver. Refer to Appendix #2k.

Where an occurrence of Mountain Beaver is observed, within the FDU's identified in the FSP, that is not located within the approved Wildlife Habitat Area, the Plan Holders may engage the services of a qualified professional in developing a suitable management strategy.

2.2.3.13 Other Species at Risk and Managed Species

Other Species at Risk or Managed Species may occur with the FDU's outlined in the FSP. When encountered, the first step a forestry professional takes is to understand the biology and the ecological characteristics of any Species at Risk or Managed Species in a specific geographic location and then determine if any legislative or policy direction exists that may be applicable to the particular species. For example, a review of the Species at Risk Public Registry, the Committee on the Status of Endangered Wildlife in

Canada and the British Columbia Conservation Data Center would be conducted. If a Species at Risk is an Identified Wildlife Management Species and an 'Accounts and Measures' or a 'Recovery Strategy' document is available, the Plan Holders would reference those documents in order to assist in developing an appropriate management strategy in conjunction with a qualified professional.

2.2.3.14 Wildlife Habitat Features

The government may identify categories of wildlife habitat features to protect certain bird nests, significant mineral licks and other localized habitat features. As of the date of the FSP, there are no designated wildlife habitat features in the FDU's outlined in the FSP.

2.2.4 Water, Fish, Wildlife and Biodiversity within Riparian Areas

As stated in the FSP, the objective set by government for water, fish, wildlife and biodiversity within riparian areas is, without unduly reducing the supply of timber from British Columbia's forests, to conserve, at the landscape level, the water quality, fish habitat, wildlife habitat and biodiversity associated with those riparian areas.

Riparian areas occur immediately adjacent to, or in close proximity, to the banks of streams, lakes and wetlands, and includes both the area dominated by a continuous high moisture content and the adjacent upland vegetation that exerts an ecological and biological influence.

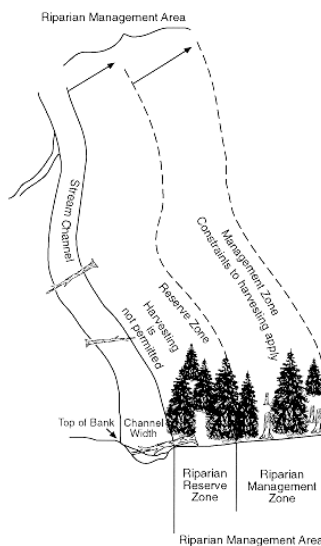


Figure 2. Riparian Management Area showing the application of a Riparian Reserve Zone and a Riparian Management Zone along a stream channel. The figure was taken from the Forest Practices Code Riparian Management Handbook (December 1995).

In order to meet the objective set by government for water, fish, wildlife and biodiversity within riparian areas, the Plan Holders will adopt the default practice requirements outlined in Sections 47 (Stream Riparian Classes), 48 (Wetland Riparian Classes), 49 (Lake Riparian Classes), 50 (Restrictions in a Riparian Management Area), 51 (Restrictions in a Riparian Reserve Zone), 52(2) (Restrictions in a Riparian Management Zone) and 53 (Temperature Sensitive Streams) of the FPPR during the term of the plan.

Table 1. Riparian classifications as well as the widths of the riparian reserve and riparian management zones.

Riparian Class	Width or Area	Riparian Management Area	Riparian Reserve Zone	Riparian Management Zone
S1-A (Fish)	>100m	100m	0m	100m
S1-B (Fish)	20-100m	70m	50m	20m
S2 (Fish)	5-20m	50m	30m	20m
S3 (Fish)	1.5-5m	40m	20m	20m
S4 (Fish)	<1.5m	30m	0m	30m
S5 (Non-Fish)	>3m	30m	0m	30m
S6 (Non-Fish)	<3m	20m	0m	20m
W1	>5ha	50m	10m	40m
W2	1-5ha	30m	10m	20m
W3	1-5ha	30m	0m	30m
W4	0.5-1ha	30m	0m	30m
W5	Complex >5ha	50m	10m	40m
L1-A	>1000ha	0m	0m	0m
L1-B	5-1000ha	10m	10m	0m
L2	1-5ha	30m	10m	20m
L3	1-5ha	30m	0m	30m
L4	0.5-1ha	30m	0m	30m

Additionally, Section 12(3) of the FPPR states ‘a person who prepares a forest stewardship plan must specify in it, for the objective set out in Section 8, a result or strategy that addresses retention of trees in a riparian management zone’. To address the retention of trees within a riparian management zone, the Plan Holders follow a slightly modified version of the basal area retention levels described for minor tenure holders in Section 52 of the FPPR.

Table 2. Basal area retention within a Riparian Management Zone by riparian classification.

Column #1 Riparian Classification	Column #2 Gross Basal Area (m ² /ha) to be Retained within Riparian Management Zone (%)
S1-A	≥ 20%
S1-B	≥ 20%
S2	≥ 20%
S3	≥ 20%
S4	≥ 10%
S5 (Valley Bottom)	≥ 10%
S5 (Non-Valley Bottom)	≥ 0%
S6	≥ 0%
All Wetland Classifications	≥ 10%
L1-A and L1-B Lake Classifications	≥ 0%
L2, L3 and L4 Classifications	≥ 10%

The basal area retention levels within the Riparian Management Zone will be specified within the Site Plan prior to timber harvesting operations. Through recommendations provided by qualified professionals, the retention trees will be selected based on the consideration of the factors that appear in Schedule 1, Section 2 of the FPPR as well as an assessment of the windthrow hazard. The following provides a list of the factors to be considered in the selection of the retention trees:

- The need to buffer the riparian feature from the introduction of materials that are deleterious to water quality or fish habitat,
- The role played by trees and understory vegetation in conserving water quality, fish habitat, wildlife habitat and biodiversity,
- The role of the riparian management zone in maintaining stream bank and stream channel integrity and normally functioning drainage processes,
- The relative importance and sensitivity of the riparian feature/class in conserving water quality, fish habitat, wildlife habitat and biodiversity,
- The type, timing or intensity of forest practices that are proposed,
- The species composition and physical structure of the riparian management zone as it was prior to timber harvesting,
- The potential safety hazards,
- The role of the riparian management zone, where applicable, in maintaining the integrity of the associated riparian reserve zone,
- The risk as determined by a windthrow hazard assessment to ensure the identified basal area retention will have an acceptable risk (low to moderate) to damaging wind events,
- The risk, where applicable, as determined by a terrain stability field assessment, and

- The role of forest shading in controlling an increase in temperature within a temperature sensitive stream, if the increase might have a deleterious effect on fish or fish habitat.

The retained trees will consist of merchantable and non-merchantable coniferous and deciduous tree species and will be reasonably representative of the stand structure and composition of the Riparian Management Zone as it was prior to harvesting.

2.2.5 Fish Habitat in Fisheries Sensitive Watersheds

Considering that no fisheries sensitive watersheds are identified in Schedule 2 of the FPPR within the Chilliwack Natural Resource District, no results and/or strategies are required to meet the objective set by government for fish habitat in fisheries sensitive watersheds.

2.2.6 Water in a Community Watershed

As stated in the FSP, the objective set by government for water in community watersheds is, without unduly reducing the supply of timber from British Columbia's forests, to prevent the cumulative hydrological effects of primary forest activities within the community watershed from resulting in (a) a material adverse impact on the quantity of water or the timing of flow of the water from the waterworks, or (b) the water from the waterworks having a material adverse impact of human health that cannot be addressed by water treatment required under (i) an enactment, or (ii) the license pertaining to the waterworks.

Existing community watersheds and objectives established under the *Forest Practices Code of British Columbia Act* are grandparented into the FRPA. Within the FDU's described in the FSP, a total of thirty-seven (37) designated Community Watersheds exist. The applicable Community Watersheds include: Domitian, Elbow, Adams Spring, Ascaphus, Cupola, Edmeston, Southbright, Spring, Watt, Young Creek, Ichilaka, Kopp, Edna, Sasquatch, Thunderbird, Dunville, Elk, Fin, Knox, Nevin, Parent, Volkert, Wells, Cannell Lake, Deroche, Kenworthy, Norrish, Campsite, Trite, Stormy, Choate, Inkawthia, Skeemis, Cohen, Pickney, Schkam Lake and Yale. Refer to Appendix #3.

The legislative requirements to address primary forest activities within community watersheds or in the vicinity of water that is diverted for human consumption by a licensed waterworks are found within Sections 59 (Protecting Water Quality), 60 (Licensed Waterworks), 61 (Excavated or Bladed Trails), 62 (Roads in a Community Watershed) and 63 (Use of Fertilizers) of the FPPR.

These legislative requirements combined with the strategy to communicate and cooperate with other forest agreement holders to conduct a Watershed Assessment every 5 years unless no primary forest activities are scheduled to occur are intended to address the objective. The Watershed Assessment, completed by a qualified professional, will reflect the current and proposed future conditions of the community watershed and address the key elements of the

hydrologic and geomorphic processes in the watershed. Additionally, the Plan Holders will ensure that their planned primary forest activities are designed and implemented to be consistent with the results and recommendations of the Watershed Assessment.

2.2.7 Wildlife and Biodiversity – Landscape Level

As stated in the FSP, objective set by government for wildlife and biodiversity at the landscape level is, without unduly reducing the supply of timber from British Columbia's forests and to the extent practicable, to design areas on which timber harvesting is to be carried out that resemble, both spatially and temporally, the patterns of natural disturbance that occur within the landscape. In order to meet this objective, the Plan Holders will adopt the default practice requirements outlined in Sections 64 (Maximum Cutblock Size) and 65 (Harvesting Adjacent to Another Cutblock) of the FPPR during the term of the plan.

2.2.8 Wildlife and Biodiversity – Stand Level

As stated in the FSP, the objective set by government for wildlife and biodiversity at the stand level is, without unduly reducing the supply of timber from British Columbia's forests, to retain wildlife trees. For the Anderson, Big Silver, Chehalis, Chilliwack, Coquihalla, East Harrison, Manning, Silverhope, Spuzzum, Tretheway, West Harrison and Yale Landscape Units, the Plan Holders will maintain stand level structural diversity by retaining wildlife tree patches/wildlife tree retention areas in accordance with Objective #2 of the applicable Order to Establish a Landscape Unit and Objectives. For the Fraser Valley South, Hatzic, Stave Landscape Unit, the Plan Holders will maintain stand level structural diversity by retaining wildlife tree patches/wildlife tree retention areas in accordance with Section 66 (Wildlife Tree Retention) of the FPPR. Refer to Appendix #1.

The size of wildlife tree patches or wildlife tree retention areas are based on a percentage of the area harvested and the ecosystem classification of the site. For example, a cutblock within the West Harrison Landscape Unit and the CWHdm biogeoclimatic subzone requires a wildlife tree patch or wildlife tree retention area that is equal to 14% of the total area under prescription. There are exceptions under the Order to Establish Landscape Unit and Objectives and the *Forest Planning and Practices Regulation* whereby a specific process may be followed to harvest a Wildlife Tree Patch or Wildlife Tree Retention Area. However, these exceptions also contain requirements to replace the original retention areas with similar or better retention areas.

The Plan Holders have proposed strategies in the FSP that will provide for both the protection of wildlife and biodiversity under this objective and administrative efficiencies in the management of retention areas. For example, in the case of the latter, if a new road location requires the harvesting of part of an existing Wildlife Tree Patch or Wildlife Tree Retention Area, a replacement area of equal or better quality and quantity would need to be located nearby. Or, for example, if the original Wildlife Tree Patch or Wildlife Tree Retention Area

caused the isolation of trees, trees that could not be subsequently harvested due to topographic limitations, a situation that could be deemed contrary to the government's objective for timber supply, then the original retention area would be relocated. This action would therefore achieve both forestry objectives. The process to salvage windthrown or unhealthy trees is outlined in the current Order to Establish Landscape Unit and Objectives; however, the Plan Holders have proposed that burnt trees be added to the salvage process.

This Forest Stewardship Plan contains specific strategies that allow for the careful relocation of Wildlife Tree Patches or Wildlife Tree Retention Areas. These strategies are closely aligned with the Landscape Objectives and *Forest Planning and Practices Regulations* governing the replacement of retention areas.

The general process is described as follows: A Qualified Professional will consult with either the original signing professional or the applicable Licensee to determine the significance of the original retention area. For instance, was the retention area delineated to protect a specific non-timber feature or was it the retention area's stand attributes that required critical protection for the maintenance of wildlife or biodiversity values. The qualified professional could then determine if replacement of the retention area, or portion thereof, is appropriate. If replacement is appropriate, the qualified professional would determine an area of equivalent or better qualities according to the characteristics of the original retention area. The Wildlife Tree Patch or Wildlife Tree Retention Area amendments would be reported to government either by providing a notice containing the information required to update the RESULTS application or by making the RESULTS data entry directly.

2.2.9 Visual Quality

Visual quality management involves meeting Visual Quality Objectives (VQO) for designated or known scenic areas. VQO's are established by government agencies or contained in higher level plans and these objectives reflect the desired level of visual quality based on the physical characteristics and social expectations or particular viewsapes. A result and/or strategy to address Section 9.2 of the FPPR is not required as visual quality objectives have been continued and established by means of Section 7 and 17 of the *Government Actions Regulation* (GAR).

In the Chilliwack Natural Resource District, scenic areas were previously made 'known' and established under the *Forest Practices Code of British Columbia Act* and later continued under the current legislation through the *Government Actions Regulation*. Refer to Appendix #4.

The Plan Holders will design timber harvesting and road construction activities in a manner that is consistent with the established visual quality objectives that are in effect and applicable to the Scenic Areas in which the timber harvesting or road construction activities are located. Additionally, the Plan Holders will harvest timber and construct road in a manner consistent with the design and the visual quality objectives as provided through the completion of a Visual Impact Assessment, where warranted.

Table 3. Categories of Visually Altered Forest Landscapes and a definition of each category as described in Section 1.1 of the FPPR.

Category of Alteration	Characteristics of Cutblock or Road
Preservation	Consisting of an altered forest landscape in which the alteration, when assessed from a significant public viewpoint, is (i) very small in scale, and (ii) not easily distinguishable from the pre-harvest landscape.
Retention	Consisting of an altered forest landscape in which the alteration, when assessed from a significant public viewpoint, is (i) difficult to see, (ii) small in scale, and (iii) natural in appearance.
Partial Retention	Consisting of an altered forest landscape in which the alteration, when assessed from a significant public viewpoint, is (i) easy to see, (ii) small to medium in scale, and (iii) natural and not rectilinear or geometric in shape.
Modification	Consisting of an altered forest landscape in which the alteration, when assessed from a significant public viewpoint, is (i) very easy to see, and (ii) is (a) large in scale and natural in its appearance, or (b) small to medium in scale but with some angular characteristics.
Maximum Modification	Consisting of an altered forest landscape in which the alteration, when assessed from a significant public viewpoint, is (i) very easy to see, and (ii) is (a) very large in scale, (b) rectilinear and geometric in shape, or (c) both.

2.2.10 Cultural Heritage Resources

As stated in the FSP, the objective set by government for cultural heritage resources is to conserve, or, if necessary, protect cultural heritage resources that are (a) the focus of a traditional use by an aboriginal people that is of continuing importance to that people, and (b) not regulated under the *Heritage Conservation Act*.

The Plan Holders will undertake an information sharing process that is based upon standards created through government to government agreements and catered to each First Nation. Some First Nations have or may wish to enter into formal information sharing protocol agreements for the referral process with government ministries or the Plan Holders. In those cases, the Plan Holders will comply with the agreement with respect to timelines and content of information sharing packages. For those First Nations that do not enter into protocol agreements, the Plan Holders will work with specific First Nations and the government to ensure information sharing is appropriate.

The Plan Holders will have an Archaeological Impact Assessment, completed for cut blocks and roads proposed by the Plan Holders when requested by the affected First Nation through the engagement process.

Cedar can be made available to First Nations using the 2005 Ministry of Forests policy *Guidelines for Managing Cedar for Cultural Purposes*. Refer to Appendix #5.

2.3 Objectives in Addition to Those Set by Government

As stated in the FSP, there are additional objectives that require the preparation of results, strategies or measures that are not included in Section 149(1) of the FRPA or Sections 5 through 10 of the FPPR. As previously mentioned, these sections specify the objectives set by government with regard to forest management and development activities on crown lands. The following sections detail the objectives not established by government, but those that still require the drafting of appropriate results, strategies or measures.

2.3.1 Prevention of the Introduction & Spread of Invasive Plants

As stated in the FSP, a person who prepares a forest stewardship plan must specify measures in the plan to prevent the introduction or spread of species of plants that are invasive plants under the *Invasive Plants Regulation*, if the introduction or spread is likely to be the result of the person's forest practices.

The *Invasive Plant Regulation* provides a provincial listing of the plants that are considered weeds and have invasive habits. Refer to Appendix #6. Through the measures expressed in the FSP, the Plan Holders have committed to use a qualified professional to monitor the presence and spread of invasive plant species while conducting field related forest management activities within cutblocks and roads that are subject to a permit held by the Plan Holders within the FDU's identified in the FSP as well as record any observed occurrences of invasive plant species and annually report their presence through the Invasive Alien Plant Program (IAPP) Application.

In areas where invasive plants have been identified and more than 0.25 hectares of continuous mineral soil has been exposed by road or landing construction or scarification within a cutblock ('the disturbed area'), a qualified professional will prescribe revegetation activities based on a risk assessment for the site and the invasive plant species characteristics. Where re-vegetation is prescribed, the Plan Holders will re-vegetate the disturbed area within two years of disturbance and within the growing season, with the exclusion of the road surface of active roads, if such disturbance is likely to result in the introduction or spread of invasive plants species identified with the area, and such re-vegetation will materially reduce the likelihood or the spread of invasive plant species identified in the area.

Additionally, the Plan Holders will revegetate disturbed areas that will meet or exceed Common #1 Forage seed mixture and will monitor the revegetated areas prescribed by a qualified professional.

2.3.2 Mitigating the Effect of Removing or Rendering Ineffective Natural Range Barriers

As stated in the FSP, a person who prepares a forest stewardship plan must specify measures to mitigate the effect of removing or rendering ineffective natural range barriers.

Through the measures expressed in the FSP, the Plan Holders, will gather information related to range tenures that exist within the FDU's included in the FSP and inform an affected holder of an agreement under the *Range Act* of primary forest activities within or immediately adjacent to their range tenure agreement. Where the affected holder of an agreement under the *Range Act* communicates that the primary forest activities will remove or render ineffective a natural range barrier, the Plan Holders will carry out reasonable, and mutually agreed upon, measures to mitigate the effect of removing or rendering ineffective a natural range barrier.

2.3.3 Recreation Resources and Features

Within the Chilliwack Natural Resource District there are three (3) categories of recreational features, which include recreational trails, recreational sites, and interpretive forests. The categories are as follows:

- Recreation Features Established with Objectives
 - There are a number of established recreation features with objectives within the Chilliwack Natural Resource District. All of these occur within the Chilliwack River Valley, which is included within the Chilliwack FDU described within the FSP.
 - Under the authority of Section 56 of the FRPA, the Regional Manager for the Coast Recreation Region established objectives on October 10th, 2012 for the following Recreation Trails: Baby Munday Trail, Elk-Thurston Trail, Ford Mountain Trail, Ling Lake Trail, Mount Cheam Trail, Mount McGuire Trail, Mount Rexford Trail, Pierce Lake Trail, Slesse Memorial Trail, Slesse Mountain Trail, Vedder Mountain Trail, Williams Peak Trail and Williamson Lake Trail. Refer to Appendix #7.
 - In order to meet the established objectives for these recreation trails, the Plan Holders will maintain the unique recreation experience of hiking through a forested and sub-alpine setting by ensuring primary forest activities are designed to follow the targets/actions described in the 'Guidance Document for Established Trails with Legal Objectives in the Chilliwack River Valley' as provided by the Chilliwack Natural Resource District Recreation Officer as well as obtaining and following, recommendations from the Chilliwack Natural Resource District Recreation Officer, should primary forest activities vary from the targets/actions as described in the 'Guidance Document for Established Trails with Legal Objectives in the Chilliwack River Valley'.
 - Additionally, the Plan Holders will avoid building access structures over the established recreation trail unless no other practicable alternative exists and maintain new access structures in a manner that makes the best effort to prevent all motorized vehicles from accessing the trail by employing measures such as the installation of gates, large unmovable boulders or deactivation of the road prism.

- Recreation Features Established with No Objectives
 - There are a number of established recreation features with no objectives located within the FDU's included in the FSP. Refer to Appendix #7 for a list of these features.
- Recreation Features Not Established
 - There are a number of recreation features that are not established and do not have objectives located within the FDU's included in the FSP.

The Plan Holders recognize all of the above noted categories of recreational features and understands that these recreation features may be very important to particular user groups or the general public. It is the intention of the Plan Holders, when these features are encountered, to submit for approval to the Recreation Officer an authorization under Section 16 of the *Forest Recreation Regulation* and, where warranted, communicate and seek input from potentially affected user groups to ensure appropriate management strategies are developed.

2.3.4 Resource Features

The Order to Identify Karst Resource Features in the Chilliwack Forest District was approved on June 1, 2010. As stated in the FSP, the Plan Holders have committed to engaging a qualified professional to complete an assessment related to karst caves, the important features and elements within very high or high vulnerability karst terrain and significant karst features and manage the area as outlined in the recommendations of the assessment. Additionally, the Plan Holders will provide any information related to karst features encountered, upon request, to the applicable government agency. Refer to Appendix #8.

The Order to Identify a Cultural Heritage Resource Feature on Mt. Woodside (Kweh-Kwuch-Hum) for the Chilliwack Forest District was approved on June 23, 2008. As stated in the FSP, the Plan Holders have committed to not engage in primary forest activities within the High Cultural Features and Use Area (Red Zone) and the Dispersed Cultural Features and Use Area (Yellow Zone) unless otherwise permitted in the Order and with the consent of the applicable Aboriginal People(s). Refer to Appendix #9.

3.0 Domestic Water Users and/or License Holders

There are a number of water licenses issued for domestic, irrigation, conservation, and/or power generation uses that are located within or immediately adjacent to the FDU's described in the FSP. Given the significant number of water license holders, it was determined that notification of the availability of the FSP for public review and comment, by letter, was far too onerous. Instead, the Plan Holders are prepared and committed to make reasonable efforts to contact specific water license holders of proposed timber harvesting or road construction

activities where there is a perceived potential for impact. Typically, this would include forestry development activities that are located in the general vicinity (< 100m) of their water intake or point of diversion. This communication will assist in the planning of forestry operations and will ensure that no adverse impacts to water diverted for human consumption will result from the activities of the Plan Holders.

As indicated within the section pertaining to Community Watersheds, the following sections of the *Forest Planning and Practices Regulation* pay specific regard to primary forest activities in areas that are in close proximity to community watersheds or where water is being diverted for human consumption: Sections 59 (Protecting Water Quality), 60 (Licensed Waterworks), 61 (Excavated or Bladed Trails), 62 (Roads in a Community Watershed) and 63 (Use of Fertilizers). Adhering to these legislative requirements as well as fostering constructive communication with potentially affected water license holders will ensure that adverse impacts are avoided.

4.0 Private Land Owners

There are a number of private lots that are located immediately adjacent to the Plan Holders' FDU's described in the FSP. Given the significant number of private land owners, it was determined that notification of the availability of the FSP for public review and comment, by letter, was far too onerous. Instead, the Plan Holders are prepared to make reasonable efforts to contact and inform private land owners of proposed timber harvesting or road construction activities where there is a perceived potential for impact. The Plan Holders will endeavor to work cooperatively with adjacent private land owners and take appropriate and reasonable measures to mitigate adverse impacts and ensure the maintenance of the values and features encompassed by the adjacent private property.

5.0 Climate Change

There is increasing evidence to support the occurrence of climate change in the Fraser Timber Supply Area; however, given the time scale at which climate change evolves and expresses itself, it is the opinion of the Plan Holders that it is the responsibility of government agencies to study and provide recommendations to forest tenure/agreement holders. The Plan Holders will continue to engage and stay current on the continuing discussions related to climate change in the Fraser Timber Supply Area and will amend the FSP should new and actionable information be made available.



PROBYN LOG LTD.

Appendix 1

Landscape Unit Plans



File: ORCS 17580-55/ Fraser Canyon

**ORDER TO ESTABLISH
A LANDSCAPE UNIT AND OBJECTIVES**

ANDERSON LANDSCAPE UNIT

Pursuant to Section 4 of the *Forest Practices Code of British Columbia Act*, I hereby establish the Anderson Landscape Unit, an area located on the east side of the Fraser Canyon, Chilliwack Forest District, effective January 13, 2004, 2004.

The boundaries of the Anderson Landscape Unit are shown on the Anderson Landscape Unit map, dated December 11, 2003, attached to this Order.

In addition, I hereby establish objectives for the Anderson Landscape Unit, as attached to this Order, effective January 13, 2004, 2004.

(Original signed by)

**Regional Director, Coast Region,
Ministry of Sustainable Resource Management**

Date

Legal Objectives for the Anderson Landscape Unit

Pursuant to section 4 of the *Forest Practices Code of British Columbia Act*, the following are landscape unit objectives for the Anderson Landscape Unit. The goal of these objectives is to sustain biological diversity at the landscape level; exemptions are included to streamline administrative procedures and address operational safety concerns.

First Nations traditional use of forest resources, treaty negotiations or settlements will not be limited by the following objectives.

Objective 1

1. Maintain or recruit old growth forests in designated old growth management areas (OGMAs), as shown on the attached Anderson Landscape Unit map dated December 11, 2003. Timber harvesting, including salvage, single tree selection, topping for cone harvesting, and commercial gathering of botanical forest products, will not be permitted within OGMAs except as specified in section 2 and 3 below.
2. The Delegated Decision Maker (DDM) may allow operations to occur within an OGMA for reasons such as:
 - (1) To prevent the spread of insect infestations or diseases that pose a significant threat to forested areas outside of OGMAs. This will be done in a manner that retains as many old growth forest attributes as possible.
 - (2) Construction of roads and yarding corridors if no other practicable option exists.
3. Exemptions:
 - (1) Maintenance, deactivation, removal of danger trees, or brushing and clearing on existing roads under active tenure within the right-of-way for safety purposes.
 - (2) Felling of guyline clearance, tailhold anchor trees, or danger trees (except high value wildlife trees) along cutblock boundaries or within the right of way on new road/bridge alignments to meet safety requirements.
 - (3) OGMAs that are >10 ha in size may be modified for operational reasons up to a cumulative maximum of :
 - a) 15 ha in variant CWHds1,
 - b) 80 ha in variant CWHms1,
 - c) 40 ha in variant ESSFmw,
 - d) 35 ha in IDFww, and
 - e) 50 ha in variant MHmm2,provided that replacement OGMA of equivalent or better quality and quantity is identified in order of priority, 1) immediately adjacent to the existing OGMA, or 2) in the same variant and landscape unit as the existing OGMA; such that OGMA ecological attributes and spatial distribution are maintained or improved, in one of the following categories:
 - i) OGMAs >10 ha to <50 ha in size where the proposed development affects the OGMA by <5 ha,
 - ii) OGMAs ≥50 ha to <100 ha in size where the proposed development affects the OGMA by <10ha,
 - iii) OGMAs ≥100 ha in size where the proposed development affects the OGMA by <10%.
 - iv) Construction of ≤500m of road or a bridge within an OGMA where there is no other practicable option. As an alternative to finding replacement area, the licensee may permanently deactivate or rehabilitate a temporary road or bridge site within four years after construction.

- v) Construction of rock quarries and gravel pits under authority of forest tenure where the development will be located immediately adjacent to existing roads under tenure and will affect the OGMA by <0.5 ha.
 - (4) Intrusions, other than those specified in (3) above, that affect an OGMA by less than 0.5 hectare in total.
4. Exemption 3(3) above does not apply to the following OGMA: # 29, 35, 36, 51, 63, 64, 79, 80, 87, 99, 100.
 5. In OGMA #87, 30-50% basal area removal may occur within the Riparian Management Zone adjacent to the Anderson River.

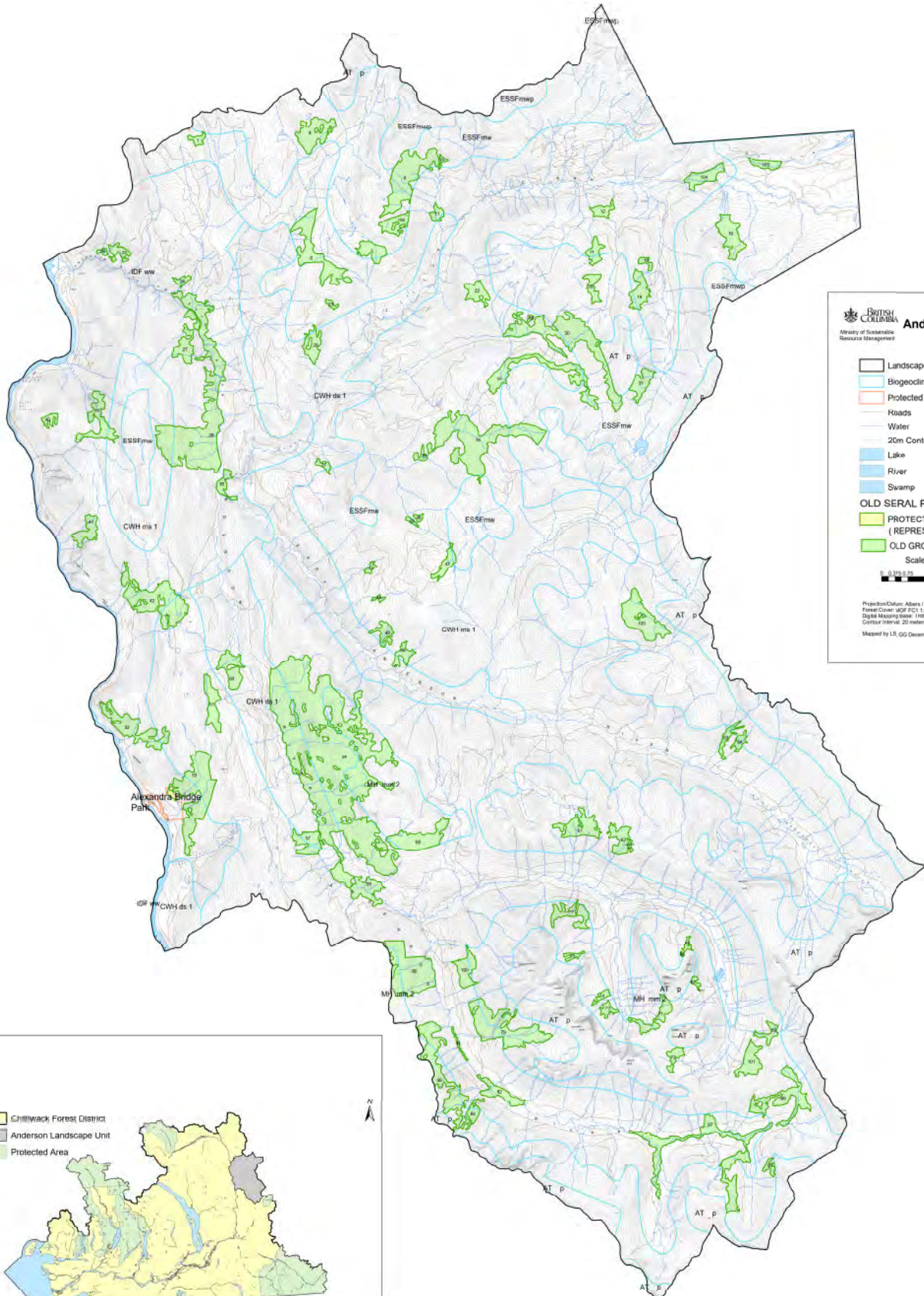
Objective 2

Maintain stand level structural diversity by retaining wildlife tree patches (WTP). Cutblocks for which harvesting has been completed by each licensee by tenure will retain adequate amounts of wildlife tree patches to ensure that over each 3 year period, commencing on the date the objectives are established, the target percentage as noted in Table A is achieved. In addition:

- (1) WTPs must be well distributed across the BEC subzone and located within or immediately adjacent to a cutblock.
- (2) Each cutblock >10 ha in size must have a minimum of 2% wildlife tree retention.
- (3) No timber harvesting, including single tree selection, is to occur within WTPs for at least one rotation, except as noted in (4) below.
- (4) Salvage of windthrown timber and harvesting of remaining standing stems is only permitted within WTPs where catastrophic windthrow exceeds 50% of the dominant or co-dominant stems; or where forest health issues pose a significant threat to areas outside the WTP. Where salvage/harvesting is planned and authorized, replacement WTP of equivalent or better quality and quantity must be identified immediately to achieve the retention target.
- (5) WTPs must include, if present, remnant old growth patches and live or dead veteran trees (excluding danger trees).
- (6) WTPs must include representative larger trees for the stand and any existing moderate to high value wildlife trees (excluding danger trees).
- (7) Where differences exist between mapped and actual BEC subzones, subzones will be confirmed by site plan information.

Table A. Wildlife Tree Retention by BEC subzone in the Anderson Landscape Unit.

BEC Subzone	% Wildlife Tree Retention
CWH ds (Coastal Western Hemlock, dry subarctic)	9
CWH ms (Coastal Western Hemlock, moist subarctic)	9
ESSF mw (Engelmann Spruce-Subalpine Fir, moist warm subzone)	6
MHmm (Mountain Hemlock, moist maritime subzone)	7
IDF ww (Interior Douglas-fir, wet warm subzone)	5



BRITISH COLUMBIA
 Ministry of Sustainable Resource Management

Anderson Landscape Unit

- Landscape Unit Boundary
- Biogeoclimatic Ecosystem Boundary
- Protected Area
- Roads
- Water
- 20m Contours
- Lake
- River
- Swamp

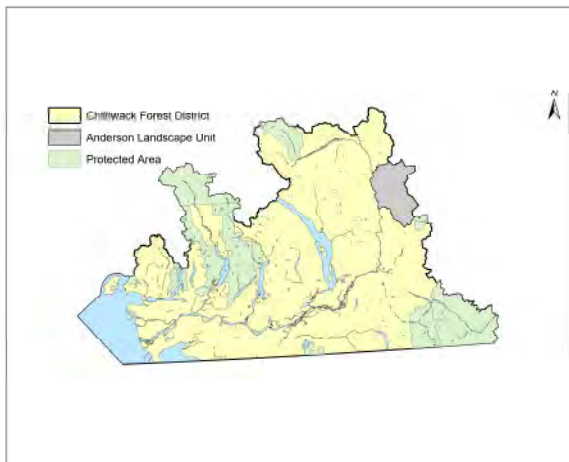
OLD SERAL REPRESENTATION AREAS

- PROTECTED AREA OLD GROWTH (REPRESENTATION CONTRIBUTION)
- OLD GROWTH MANAGEMENT AREAS

Scale 1: 40 000

0 0.5 1.0 1.5 2.0 2.5 Kilometers

Projection: Datum: Albers / NAD 83 Author: L.S. GG 10/01/01
 Forest Cover: MCF FC1 1: 20 000 Date: December 11, 2001
 Digital Mapping Scale: 1:6000 1: 20 000 Amendment:
 Contour Interval: 20 meters Map:
 Mapped by L.S. GG December 11, 2001 Date:





File: ORCS 17580-30/BISI

**ORDER TO ESTABLISH
A LANDSCAPE UNIT AND OBJECTIVES**

BIG SILVER LANDSCAPE UNIT

Pursuant to Section 4 of the *Forest Practices Code of British Columbia Act*, I hereby establish the Big Silver Landscape Unit, an area located near Harrison Lake and in the vicinity of the Big Silver River, effective June 24th, 2005.

The boundaries of the Big Silver Landscape Unit are shown on the Big Silver Landscape Unit map dated 2 December 2004 accompanying this Order.

In addition, I hereby establish Landscape Unit Objectives for the Big Silver Landscape Unit, as attached to this Order, effective June 24th, 2005.

(Original signed by)

June 7th, 2005

**Regional Director, Coast Region,
Ministry of Sustainable Resource Management**

Date

Preamble

The goal of these objectives is to sustain biological diversity at the landscape level; permissible activities are described to streamline administrative procedures and address operational safety concerns.

First Nations traditional use of forest resources, treaty negotiations or settlements will not be limited by the following objectives.

Legal Objectives – Big Silver Landscape Unit

Pursuant to Section 4 of the *Forest Practices Code of British Columbia Act*, the following are Landscape Unit Objectives for the Big Silver Landscape Unit.

Objective 1

1. Maintain or recruit old growth forests in established old growth management areas (OGMAs), as shown on the attached Big Silver Landscape Unit map dated 2 December 2004 subject to timber harvesting and road construction in accordance with section 2, 3 and 4 below.
 2. (1) Where sufficient suitable replacement forest is available in the variants listed below, timber harvesting or road construction may be undertaken in OGMAs that are >10 ha in size for operational reasons up to a cumulative maximum of:
 - i) 30 ha in variant CWHds1,
 - ii) 25 ha in variant CWHms1, and
 - iii) 25 ha in variant MHmm2,provided that replacement OGMA of equivalent or better quality and quantity is identified in order of priority, 1) immediately adjacent to the existing OGMA, or 2) in the same variant and landscape unit as the existing OGMA.
 - (2) The criteria in 2 (1) is to apply to individual OGMAs within the categories below and must ensure that OGMA ecological attributes and spatial distribution are maintained or improved:
 - i) OGMAs >10 ha to <50 ha in size where the proposed activity affects the OGMA by <5 ha,
 - ii) OGMAs ≥50 ha to <100 ha in size where the proposed activity affects the OGMA by <10ha,
 - iii) OGMAs ≥100 ha in size where the proposed activity affects the OGMA by <10%.
 - iv) Construction of ≤500m of road or a bridge within an OGMA where there is no other practicable option. As an alternative to finding replacement area, the licensee may permanently deactivate and rehabilitate a temporary road or bridge site within four years after construction.
 - (3) Where OGMA boundary adjustments and replacement areas are required under section 2 (1) and (2) they must be documented, mapped and submitted to the satisfaction of the Delegated Decision Maker (DDM) at the end of each calendar year for his/her approval.
 - (4) The provisions in section 2 (1) and (2) do not apply to the following OGMAs #1, 10, 42, 45, 48, 69, 90, 94, 101, 109, 111 and the mapped old forest portion in all OGMAs in the CWHds1.
3. Permissible Activities:
 - (1) Timber harvest may occur to prevent the spread of insect infestations or diseases that pose a significant threat to forested areas outside of OGMAs. Salvage within OGMAs will be done in a manner that retains as many old growth forest attributes as possible.

- (2) Construction of rock quarries and gravel pits under authority of forest tenure where the development will be located immediately adjacent to existing roads under tenure and will affect the OGMA by <0.5 ha.
- (3) Intrusions, other than those specified, that affect an OGMA by less than 0.5 hectare in total.
- (4) Where OGMA replacement forest is required as a result of activities under 3 (1) or (2), it must be of equivalent or better quality and quantity and be identified in order of priority, 1) immediately adjacent to the existing OGMA, or 2) in the same variant and landscape unit as the existing OGMA; such that OGMA ecological attributes and spatial distribution are maintained or improved. OGMA replacement areas must be documented, mapped and submitted to the satisfaction of the DDM at the end of each calendar year for his/her approval.

4. Permissible Activities for Safety Purposes:

- (1) Maintenance, deactivation, removal of danger trees, or brushing and clearing on existing roads under active tenure within the right-of-way for safety purposes.
- (2) Felling of guyline clearance, tailhold anchor trees, or danger trees (except high value wildlife trees) along cutblock boundaries or within the right of way on new road/bridge alignments to meet safety requirements.

Objective 2

Maintain stand level structural diversity by retaining wildlife tree patches (WTP). Cutblocks for which harvesting has been completed by each licensee by tenure will retain adequate amounts of wildlife tree patches to ensure that over each 3 year period, commencing on the date the objectives are established, the target percentage as noted in Table A is achieved. In addition:

- (1) WTPs must be well distributed across the BEC subzone and located within or immediately adjacent to a cutblock.
- (2) Each cutblock >10 ha in size must have a minimum of 2% wildlife tree retention.
- (3) No timber harvesting, including single tree selection, is to occur within WTPs for at least one rotation, except as noted in (4) below.
- (4) Salvage of windthrown timber and harvesting of remaining standing stems is only permitted within WTPs where catastrophic windthrow exceeds 50% of the dominant or co-dominant stems; or where forest health issues pose a significant threat to areas outside the WTP. Where salvage/harvesting is planned and authorized, replacement WTP of equivalent or better quality and quantity must be identified immediately to achieve the retention target.
- (5) WTPs must include, if present, remnant old growth patches and live or dead veteran trees (excluding danger trees).
- (6) WTPs must include representative larger trees for the stand and any moderate to high value wildlife trees (excluding danger trees).
- (7) Where differences exist between mapped and actual BEC subzones, subzones will be confirmed by site plan information.

Table A. Wildlife Tree Retention by BEC subzone in the Big Silver Landscape Unit.

BEC Subzone	% Wildlife Tree Retention
CWH ds (Coastal Western Hemlock, dry subaritime)	9
CWH ms (Coastal Western Hemlock, moist subaritime)	9
MH mm (Mountain Hemlock, moist maritime)	5



File: ORCS 17580-02/Chehalis

**ORDER TO ESTABLISH
A LANDSCAPE UNIT AND OBJECTIVES**

CHEHALIS LANDSCAPE UNIT

Pursuant to Section 4 of the *Forest Practices Code of British Columbia Act*, I hereby establish the Chehalis Landscape Unit, an area located near the Lower Mainland, north of the Fraser River – Chilliwack Forest District, effective March 15, 2006.

The boundaries of the Chehalis Landscape Unit are shown on the Chehalis Landscape Unit map dated January 31, 2006 attached to this Order.

In addition, I hereby establish objectives for the Chehalis Landscape Unit, as attached to this Order, effective March 15, 2006.

“Original signed by”

“January 30, 2006”

Lindsay Jones
Acting Regional Director, Coast Region
Integrated Land Management Bureau
Ministry of Agriculture and Lands

Date



Preamble

The goal of these objectives is to sustain biological diversity at the landscape level; permissible activities are described to streamline administrative procedures and address operational safety concerns.

First Nations traditional use of forest resources, treaty negotiations or settlements will not be limited by the following objectives.

Legal Objectives – Chehalis Landscape Unit

Pursuant to Section 4 of the *Forest Practices Code of British Columbia Act*, the following are the landscape unit objectives for the Chehalis Landscape Unit.

Objective 1 - Old Growth Management Areas (OGMAs)

1. Maintenance or recruitment of old growth forests

Maintain or recruit old growth forests in established old growth management areas (OGMAs), as shown on the attached Chehalis Landscape Unit map dated January 31, 2006, subject to timber harvesting and road construction in accordance with section 2 and 3 below.

2. Permissible activities within OGMAs

(1) Timber harvest may occur to prevent the spread of insect infestations or diseases that pose a significant threat to forested areas outside of OGMAs. Salvage within OGMAs will be done in a manner that retains as many old growth forest attributes as possible.

(2) Construction of rock quarries and gravel pits under authority of forest tenure where the development will be located immediately adjacent to existing roads under tenure and will affect the OGMA by <0.5 ha.



- (3) Construction of $500 \leq m$ of road or a bridge within an OGMA where there is no other practicable option, provided that replacement OGMA is identified.
 - 4) Intrusions, other than those specified, that affect an OGMA by less than 0.5 hectare in total.
 - 5) Where OGMA replacement forest is required as a result of activities under 2.(1), 2.(2) or 2.(3), it must be of equivalent or better quality and quantity and be identified in order of priority, 1) immediately adjacent to the existing OGMA, or 2) in the same variant and landscape unit as the existing OGMA; such that OGMA ecological attributes and spatial distribution are maintained or improved. OGMA replacement areas must be documented, mapped and submitted to the satisfaction of the DDM at the end of each calendar year for his/her approval.

3. Permissible Activities for Safety Purposes:

- 1) Maintenance, deactivation, removal of danger trees, or brushing and clearing on existing roads under active tenure within the right-of-way for safety purposes.
- 2) Felling of guyline clearance, tailhold anchor trees, or danger trees (except high value wildlife trees) along cutblock boundaries or within the right of way on new road/bridge alignments to meet safety requirements

Objective 2 – Wildlife Tree Patches (WTPs)

Maintain stand level structural diversity by retaining wildlife tree patches (WTP). Cutblocks for which harvesting has been completed by each licensee by tenure will retain adequate amounts of wildlife tree patches to ensure that over each 3 year period, commencing on the date the objectives are established, the target percentage as noted in Table A, is achieved. In addition:

- (1) WTPs must be well distributed across the BEC subzone and located within or immediately adjacent to a cutblock.
- (2) Each cutblock >10 ha in size must have a minimum of 2% wildlife tree retention.



- (3) No timber harvesting, including single tree selection, is to occur within WTPs for at least one rotation, except as noted in (4) below.
- (4) Salvage of windthrown timber and harvesting of remaining standing stems is only permitted within WTPs where catastrophic windthrow exceeds 50% of the dominant or co-dominant stems; or where forest health issues pose a significant threat to areas outside the WTP. Where salvage/harvesting is planned and authorized, replacement WTP of equivalent or better quality and quantity must be identified immediately to achieve the retention target.
- (5) WTPs must include, if present, remnant old growth patches and live or dead veteran trees (excluding danger trees).
- (6) WTPs must include representative larger trees for the stand and any moderate to high value wildlife trees (excluding danger trees).
- (7) Where differences exist between mapped and actual BEC subzones, will be confirmed by site plan information.

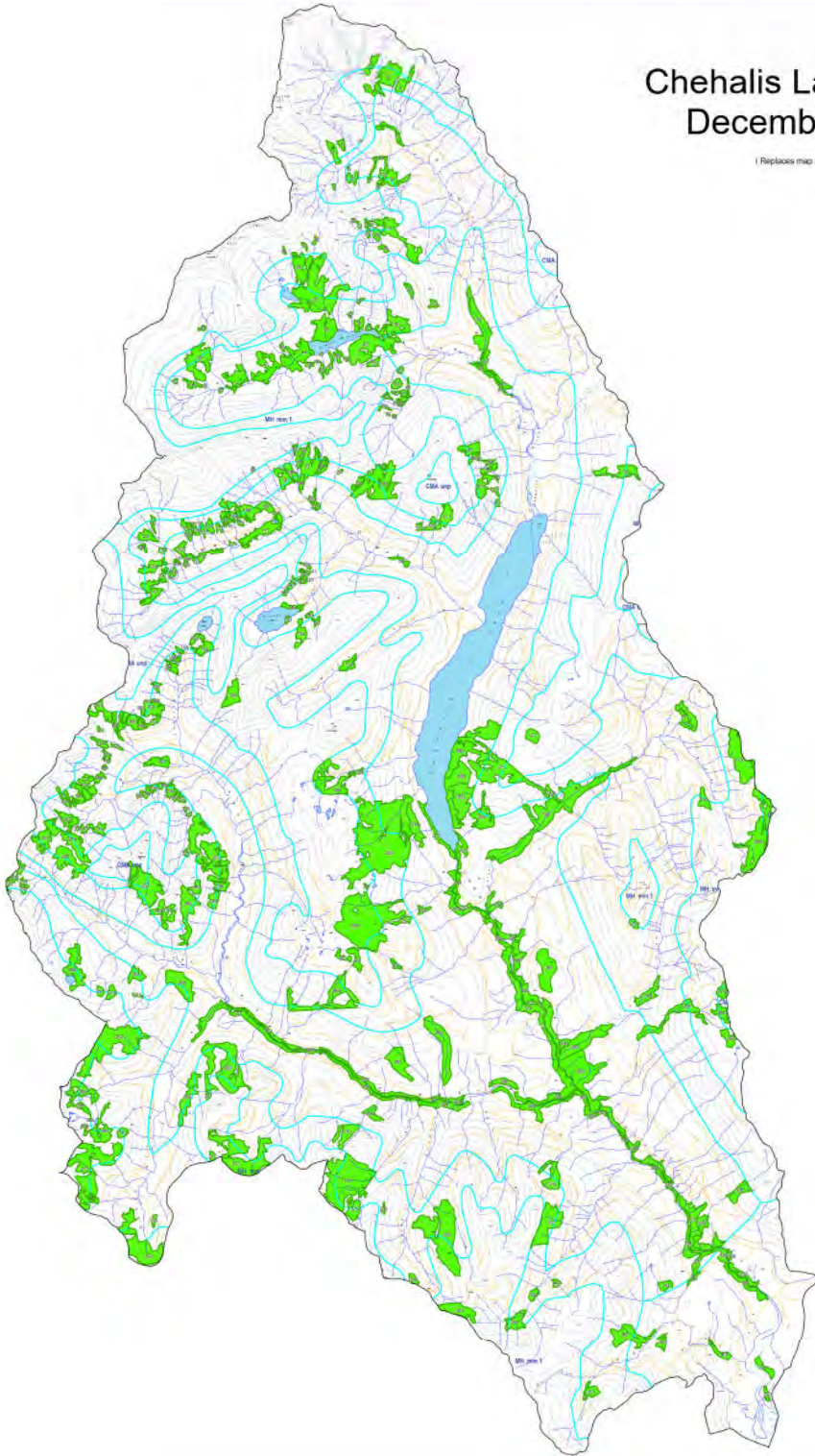
Table A. Wildlife Tree Retention by BEC Subzone in the Chehalis Landscape Unit.

BEC Subzone	% Wildlife Tree Retention
CWH dm (Coastal Western Hemlock, dry maritime)	10
CWH vm (Coastal Western Hemlock, very moist)	10
MH mm (Mountain Hemlock, moist maritime)	5

Chehalis Landscape Unit

December 23, 2008

(Replaces map dated January 31, 2006)



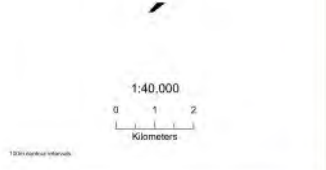
Map Study Area Within Chilliwack Forest District



Legend

- OLD GROWTH MANAGEMENT AREAS
- Biogeoclimatic Zone
- Lakes and Rivers
- Creeks
- Roads

Submitted for approval by: J.K. ILMB
 (original signed by)
 Regional Executive Director, Coast Region,
 Integrated Land Management Bureau
 (23 December 2008)
 Date: _____
 Tamen Logging Company
 Submitting Forest Licensee
 4 November 2008
 Amendment Date: _____



Produced for:
Regional Client Services Division

Produced by:
Integrated Land Management Bureau
 Lower Mainland Service Centre

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 Projection/Datum: Albers Equal Area - NAD 83
 Date Created: 2009-01-19
 Created for: Land Information Management by Harry Gill



File: ORCS 17580-30/CHIL

**ORDER TO ESTABLISH
A LANDSCAPE UNIT AND OBJECTIVES**

CHILLIWACK LANDSCAPE UNIT

Pursuant to Section 4 of the *Forest Practices Code of British Columbia Act*, I hereby establish the Chilliwack Landscape Unit, an area located in the vicinity of the Chilliwack River and Chilliwack Lake, effective June 24th, 2005.

The boundaries of the Chilliwack Landscape Unit are shown on the Chilliwack Landscape Unit map dated 2 December 2004 accompanying this Order.

In addition, I hereby establish Landscape Unit Objectives for the Chilliwack Landscape Unit, as attached to this Order, effective June 24th, 2005.

(Original signed by)

June 7th, 2005

**Regional Director, Coast Region,
Ministry of Sustainable Resource Management**

Date

Preamble

The goal of these objectives is to sustain biological diversity at the landscape level; permissible activities are described to streamline administrative procedures and address operational safety concerns.

First Nations traditional use of forest resources, treaty negotiations or settlements will not be limited by the following objectives.

Legal Objectives - Chilliwack Landscape Unit

Pursuant to Section 4 of the *Forest Practices Code of British Columbia Act*, the following are Landscape Unit Objectives for the Chilliwack Landscape Unit.

Objective 1

1. Maintain or recruit old growth forests in established old growth management areas (OGMAs), as shown on the attached Chilliwack Landscape Unit map dated 2 December 2004 subject to timber harvesting and road construction in accordance with section 2, 3 and 4 below.
 2. (1) Where sufficient suitable replacement forest is available in the variants listed below, timber harvesting or road construction may be undertaken in OGMAs that are >10 ha in size for operational reasons up to a cumulative maximum of:
 - i) 10 ha in variant CWHdm,
 - ii) 30 ha in variant CWHms1,
 - iii) 10 ha in variant CWHvm2, and
 - iv) 50 ha in variant MHmm2,provided that replacement OGMA of equivalent or better quality and quantity is identified in order of priority, 1) immediately adjacent to the existing OGMA, or 2) in the same variant and landscape unit as the existing OGMA.
 - (2) The criteria in 2 (1) is to apply to individual OGMAs within the categories below and must ensure that OGMA ecological attributes and spatial distribution are maintained or improved:
 - i) OGMAs >10 ha to <50 ha in size where the proposed activity affects the OGMA by <5 ha,
 - ii) OGMAs ≥50 ha to <100 ha in size where the proposed activity affects the OGMA by <10ha,
 - iii) OGMAs ≥100 ha in size where the proposed activity affects the OGMA by <10%.
 - iv) Construction of ≤500m of road or a bridge within an OGMA where there is no other practicable option. As an alternative to finding replacement area, the licensee may permanently deactivate and rehabilitate a temporary road or bridge site within four years after construction.
 - (3) Where OGMA boundary adjustments and replacement areas are required under section 2 (1) and (2) they must be documented, mapped and submitted to the satisfaction of the Delegated Decision Maker (DDM) at the end of each calendar year for his/her approval.
 - (4) The provisions in section 2 (1) and (2) do not apply to the following OGMAs #18, 37, 38, 57, 137, 147, 148, 152, and the mapped old forest portion of all OGMAs in the CWHdm.
3. Permissible Activities:
 - (1) Timber harvest may occur to prevent the spread of insect infestations or diseases that pose a significant threat to forested areas outside of OGMAs. Salvage within OGMAs will be done in a manner that retains as many old growth forest attributes as possible.
 - (2) Construction of rock quarries and gravel pits under authority of forest tenure where the development will be located immediately adjacent to existing roads under tenure and will affect the OGMA by <0.5 ha.

- (3) Intrusions, other than those specified, that affect an OGMA by less than 0.5 hectare in total.
- (4) Where OGMA replacement forest is required as a result of activities under 3 (1) or (2), it must be of equivalent or better quality and quantity and be identified in order of priority, 1) immediately adjacent to the existing OGMA, or 2) in the same variant and landscape unit as the existing OGMA; such that OGMA ecological attributes and spatial distribution are maintained or improved. OGMA replacement areas must be documented, mapped and submitted to the satisfaction of the DDM at the end of each calendar year for his/her approval.

4. Permissible Activities for Safety Purposes:

- (1) Maintenance, deactivation, removal of danger trees, or brushing and clearing on existing roads under active tenure within the right-of-way for safety purposes.
- (2) Felling of guyline clearance, tailhold anchor trees, or danger trees (except high value wildlife trees) along cutblock boundaries or within the right of way on new road/bridge alignments to meet safety requirements.

Objective 2

Maintain stand level structural diversity by retaining wildlife tree patches (WTP). Cutblocks for which harvesting has been completed by each licensee by tenure will retain adequate amounts of wildlife tree patches to ensure that over each 3 year period, commencing on the date the objectives are established, the target percentage as noted in Table A is achieved. In addition:

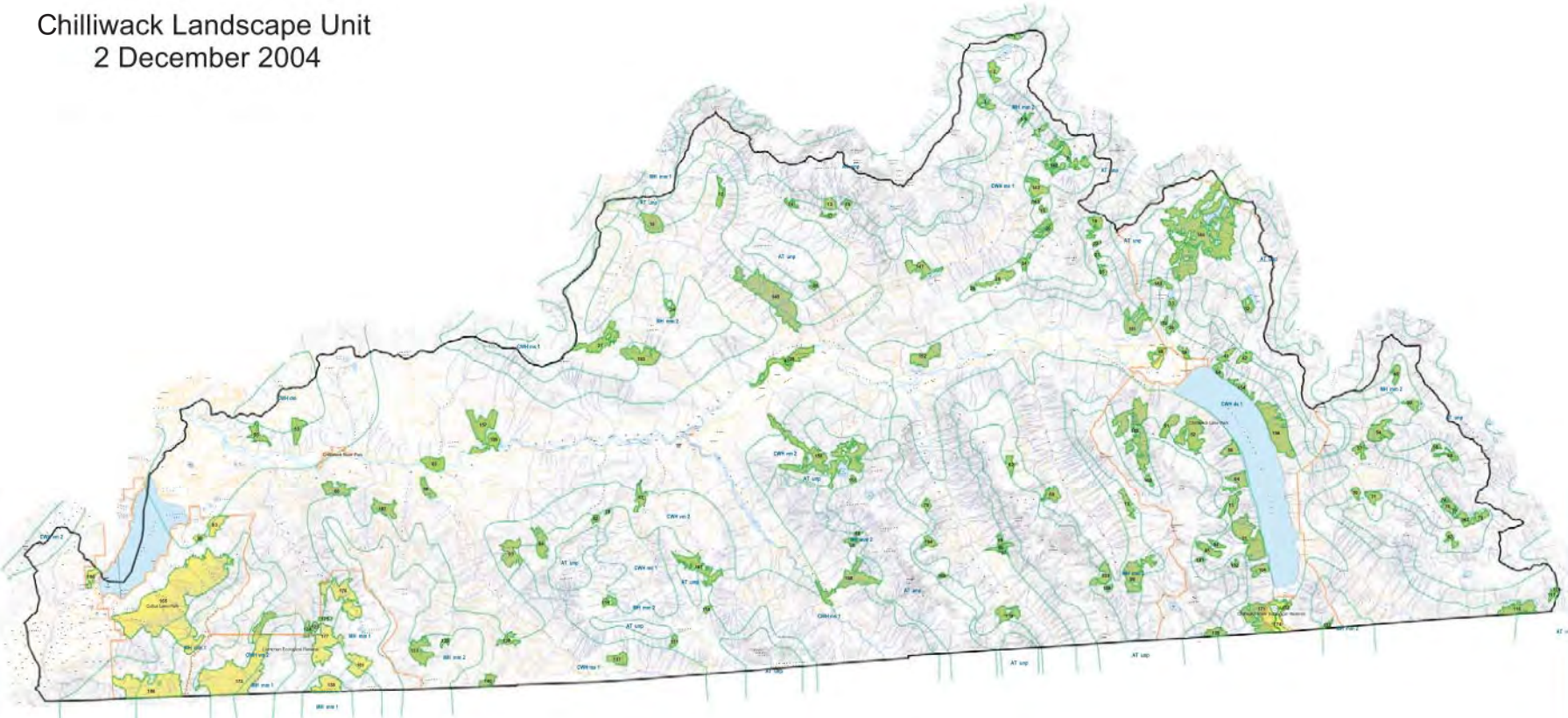
- (1) WTPs must be well distributed across the BEC subzone and located within or immediately adjacent to a cutblock.
- (2) Each cutblock >10 ha in size must have a minimum of 2% wildlife tree retention, except in the ESSFmw subzone.
- (3) No timber harvesting, including single tree selection, is to occur within WTPs for at least one rotation, except as noted in (4) below.
- (4) Salvage of windthrown timber and harvesting of remaining standing stems is only permitted within WTPs where catastrophic windthrow exceeds 50% of the dominant or co-dominant stems; or where forest health issues pose a significant threat to areas outside the WTP. Where salvage/harvesting is planned and authorized, replacement WTP of equivalent or better quality and quantity must be identified immediately to achieve the retention target.
- (5) WTPs must include, if present, remnant old growth patches and live or dead veteran trees (excluding danger trees).
- (6) WTPs must include representative larger trees for the stand and any moderate to high value wildlife trees (excluding danger trees).
- (7) Where differences exist between mapped and actual BEC subzones, subzones will be confirmed by site plan information.

Table A. Wildlife Tree Retention by BEC subzone in the Chilliwack Landscape Unit.

BEC Subzone	% Wildlife Tree Retention
CWH dm (Coastal Western Hemlock, dry maritime)	13
CWH ds (Coastal Western Hemlock, dry subarctic)	11
CWH ms (Coastal Western Hemlock, moist subarctic)	11
CWH vm (Coastal Western Hemlock, very wet maritime)	9
CWH xm (Coastal Western Hemlock, very dry maritime)	10
MH mm (Mountain Hemlock, moist maritime)	8

Chilliwack Landscape Unit

2 December 2004



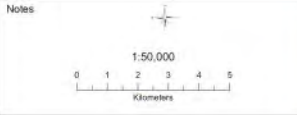
Map Study Area within the Chilliwack Forest District



Legend

- OLD GROWTH MANAGEMENT AREA
- OLD SERAL REPRESENTATION AREA
- Landscape Unit Boundary
- Protected Area
- Biogeomatic Zone
- Road
- Water Course
- Contour Line (20m Interval)
- Waterbody

Submitted by: AM, MSRM
 (original signed by)
 Regional Director, Coast Region,
 Ministry of Sustainable Resource Management
 (7 June 2005)
 Date



Produced for:
Resource Management Division

Produced by:
British Columbia
 Ministry of Sustainable Resource Management
 Business Solutions Branch
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 Projection/Datum: Albers Equal Area - NAD 83
 Date Created: 2004-Dec-02
 Created for: Surrey Contact Centre by Inssat GIS Solutions



File: ORCS 17580-30/Coquihalla

**ORDER TO ESTABLISH
A LANDSCAPE UNIT AND OBJECTIVES**

COQUIHALLA LANDSCAPE UNIT

Pursuant to Section 4 of the *Forest Practices Code of British Columbia Act*, I hereby establish the Coquihalla Landscape Unit, an area located east of Hope, BC in the Chilliwack Forest District, effective April 14, 2004.

The boundaries of the Coquihalla Landscape Unit are shown on the Coquihalla Landscape Unit map, dated March 10, 2004, attached to this Order.

In addition, I hereby establish objectives for the Coquihalla Landscape Unit, as attached to this Order, effective April 14, 2004

(Original signed by)

**Regional Director, Coast Region,
Ministry of Sustainable Resource Management**

Date

Preamble

The goal of these objectives is to sustain biological diversity at the landscape level; permissible activities are described to streamline administrative procedures and address operational safety concerns.

First Nations traditional use of forest resources, treaty negotiations or settlements will not be limited by the following objectives.

Legal Objectives - Coquihalla Landscape Unit

Pursuant to Section 4 of the *Forest Practices Code of British Columbia Act*, the following are landscape unit objectives for the Coquihalla Landscape Unit.

Objective 1

1. Maintain or recruit old growth forests in established old growth management areas (OGMAs), as shown on the attached Coquihalla Landscape Unit map dated March 10, 2004 subject to timber harvesting and road construction in accordance with section 2, 3 and 4 below.
 2. (1) Where sufficient suitable replacement forest is available in the variants listed below, timber harvesting or road construction may be undertaken in OGMAs that are >10 ha in size for operational reasons up to a cumulative maximum of:
 - i) 20 ha in variant CWHds1,
 - ii) 80 ha in variant CWHms1,
 - iii) 25 ha in variant ESSFmw, and
 - iv) 80 ha in variant MHmm2,provided that replacement OGMA of equivalent or better quality and quantity is identified in order of priority, 1) immediately adjacent to the existing OGMA, or 2) in the same variant and landscape unit as the existing OGMA.
 - (2) The criteria in 2 (1) is to apply to individual OGMAs within the categories below and must ensure that ecological attributes and spatial distribution are maintained or improved:
 - i) OGMAs >10 ha to <50 ha in size where the proposed activity affects the OGMA by <5 ha,
 - ii) OGMAs ≥50 ha to <100 ha in size where the proposed activity affects the OGMA by <10ha,
 - iii) OGMAs ≥100 ha in size where the proposed activity affects the OGMA by <10%.
 - iv) Construction of ≤500m of road or a bridge within an OGMA where there is no other practicable option. As an alternative to finding replacement area, the licensee may permanently deactivate and rehabilitate a temporary road or bridge site within four years after construction.
 - (3) Where OGMA boundary adjustments and replacement areas are required under section 2 (1) and (2) they must be documented, mapped and submitted to the satisfaction of the Delegated Decision Maker (DDM) at the end of each calendar year for his/her approval.
 - (4) The provisions in section 2 (1) and (2) do not apply to the following OGMAs #39, 98, 131, 135, 155, 170, 187.
3. Permissible Activities:
 - (1) Timber harvest may occur to prevent the spread of insect infestations or diseases that pose a significant threat to forested areas outside of OGMAs. Salvage within OGMAs will be done in a manner that retains as many old growth forest attributes as possible.

- (2) Construction of rock quarries and gravel pits under authority of forest tenure where the development will be located immediately adjacent to existing roads under tenure and will affect the OGMA by <0.5 ha.
 - (3) Intrusions, other than those specified, that affect an OGMA by less than 0.5 hectare in total.
 - (4) Where OGMA replacement forest is required as a result of activities under 3 (1) or (2), it must be of equivalent or better quality and quantity and be identified in order of priority, 1) immediately adjacent to the existing OGMA, or 2) in the same variant and landscape unit as the existing OGMA; such that OGMA ecological attributes and spatial distribution are maintained or improved. OGMA replacement areas must be documented, mapped and submitted to the satisfaction of the DDM at the end of each calendar year for his/her approval.
4. Permissible Activities for Safety Purposes:
- (1) Maintenance, deactivation, removal of danger trees, or brushing and clearing on existing roads under active tenure within the right-of-way for safety purposes.
 - (2) Felling of guyline clearance, tailhold anchor trees, or danger trees (except high value wildlife trees) along cutblock boundaries or within the right of way on new road/bridge alignments to meet safety requirements.

Objective 2

Maintain stand level structural diversity by retaining wildlife tree patches (WTP). Cutblocks for which harvesting has been completed by each licensee by tenure will retain adequate amounts of wildlife tree patches to ensure that over each 3 year period, commencing on the date the objectives are established, the target percentage as noted in Table A is achieved. In addition:

- (1) WTPs must be well distributed across the BEC subzone and located within or immediately adjacent to a cutblock.
- (2) Each cutblock >10 ha in size must have a minimum of 2% wildlife tree retention, except in the ESSFmw subzone.
- (3) No timber harvesting, including single tree selection, is to occur within WTPs for at least one rotation, except as noted in (4) below.
- (4) Salvage of windthrown timber and harvesting of remaining standing stems is only permitted within WTPs where catastrophic windthrow exceeds 50% of the dominant or co-dominant stems; or where forest health issues pose a significant threat to areas outside the WTP. Where salvage/harvesting is planned and authorized, replacement WTP of equivalent or better quality and quantity must be identified immediately to achieve the retention target.
- (5) WTPs must include, if present, remnant old growth patches and live or dead veteran trees (excluding danger trees).
- (6) WTPs must include representative larger trees for the stand and any moderate to high value wildlife trees (excluding danger trees).
- (7) Where differences exist between mapped and actual BEC subzones, subzones will be confirmed by site plan information.

Table A. Wildlife Tree Retention by BEC subzone in the Coquihalla Landscape Unit.

BEC Subzone	% Wildlife Tree Retention
CWH ds (Coastal Western Hemlock, dry subaritime)	6
CWH ms (Coastal Western Hemlock, moist subaritime)	7
ESSF mw (Engelmann Spruce Subalpine Fir moist warm subzone)	0
MH mm (Mountain Hemlock, moist maritime)	5



File: ORCS 17580-30/EHAR

**ORDER TO ESTABLISH
A LANDSCAPE UNIT AND OBJECTIVES**

EAST HARRISON LANDSCAPE UNIT

Pursuant to Section 4 of the *Forest Practices Code of British Columbia Act*, I hereby establish the East Harrison Landscape Unit, an area located near Harrison Lake and Harrison Hot Springs, effective June 24th, 2005.

The boundaries of the East Harrison Landscape Unit are shown on the East Harrison Landscape Unit map dated 2 December 2004 accompanying this Order.

In addition, I hereby establish Landscape Unit Objectives for the East Harrison Landscape Unit, as attached to this Order, effective June 24th, 2005.

(Original signed by)

June 7th, 2005

**Regional Director, Coast Region,
Ministry of Sustainable Resource Management**

Date

Preamble

The goal of these objectives is to sustain biological diversity at the landscape level; permissible activities are described to streamline administrative procedures and address operational safety concerns.

First Nations traditional use of forest resources, treaty negotiations or settlements will not be limited by the following objectives.

Legal Objectives – East Harrison Landscape Unit

Pursuant to Section 4 of the *Forest Practices Code of British Columbia Act*, the following are Landscape Unit Objectives for the East Harrison Landscape Unit.

Objective 1

1. Maintain or recruit old growth forests in established old growth management areas (OGMAs), as shown on the attached East Harrison Landscape Unit map dated 2 December 2004 subject to timber harvesting and road construction in accordance with section 2, 3 and 4 below.
2. (1) Where sufficient suitable replacement forest is available in the variants listed below, timber harvesting or road construction may be undertaken in OGMAs that are >10 ha in size for operational reasons up to a cumulative maximum of:
 - i) 40 ha in variant CWHdm,
 - ii) 15 ha in variant CWHds1,
 - iii) 20 ha in variant CWHms1,
 - iv) 5 ha in variant CWHvm1,
 - v) 40 ha in variant CWHvm2,
 - vi) 45 ha in variant MHmm1, and
 - vii) 15 ha in variant MHmm2,

provided that replacement OGMA of equivalent or better quality and quantity is identified in order of priority, 1) immediately adjacent to the existing OGMA, or 2) in the same variant and landscape unit as the existing OGMA.

- (2) The criteria in 2 (1) is to apply to individual OGMAs within the categories below and must ensure that OGMA ecological attributes and spatial distribution are maintained or improved:
 - i) OGMAs >10 ha to <50 ha in size where the proposed activity affects the OGMA by <5 ha,
 - ii) OGMAs ≥50 ha to <100 ha in size where the proposed activity affects the OGMA by <10ha,
 - iii) OGMAs ≥100 ha in size where the proposed activity affects the OGMA by <10%.
 - iv) Construction of ≤500m of road or a bridge within an OGMA where there is no other practicable option. As an alternative to finding replacement area, the licensee may permanently deactivate and rehabilitate a temporary road or bridge site within four years after construction.
- (3) Where OGMA boundary adjustments and replacement areas are required under section 2 (1) and (2) they must be documented, mapped and submitted to the satisfaction of the Delegated Decision Maker (DDM) at the end of each calendar year for his/her approval.
- (4) The provisions in section 2 (1) and (2) do not apply to the following OGMAs #22, 24, 25, 27, 109, 175, 207, 223, 246, 253 and the mapped old forest portion of all OGMAs in the CWHdm and CWHds1 variants.

3. Permissible Activities:

- (1) Timber harvest may occur to prevent the spread of insect infestations or diseases that pose a significant threat to forested areas outside of OGMA. Salvage within OGMA will be done in a manner that retains as many old growth forest attributes as possible.
- (2) Construction of rock quarries and gravel pits under authority of forest tenure where the development will be located immediately adjacent to existing roads under tenure and will affect the OGMA by <0.5 ha.
- (3) Road construction can occur in OGMA # 201 and 205 to access resource values beyond the OGMA.
- (4) Intrusions, other than those specified, that affect an OGMA by less than 0.5 hectare in total.
- (5) Where OGMA replacement forest is required as a result of activities under 3 (1) (2) or (3), it must be of equivalent or better quality and quantity and be identified in order of priority, 1) immediately adjacent to the existing OGMA, or 2) in the same variant and landscape unit as the existing OGMA; such that OGMA ecological attributes and spatial distribution are maintained or improved. OGMA replacement areas must be documented, mapped and submitted to the satisfaction of the DDM at the end of each calendar year for his/her approval.

4. Permissible Activities for Safety Purposes:

- (1) Maintenance, deactivation, removal of danger trees, or brushing and clearing on existing roads under active tenure within the right-of-way for safety purposes.
- (2) Felling of guyline clearance, tailhold anchor trees, or danger trees (except high value wildlife trees) along cutblock boundaries or within the right of way on new road/bridge alignments to meet safety requirements.

Objective 2

Maintain stand level structural diversity by retaining wildlife tree patches (WTP). Cutblocks for which harvesting has been completed by each licensee by tenure will retain adequate amounts of wildlife tree patches to ensure that over each 3 year period, commencing on the date the objectives are established, the target percentage as noted in Table A is achieved. In addition:

- (1) WTPs must be well distributed across the BEC subzone and located within or immediately adjacent to a cutblock.
- (2) Each cutblock >10 ha in size must have a minimum of 2% wildlife tree retention.
- (3) No timber harvesting, including single tree selection, is to occur within WTPs for at least one rotation, except as noted in (4) below.
- (4) Salvage of windthrown timber and harvesting of remaining standing stems is only permitted within WTPs where catastrophic windthrow exceeds 50% of the dominant or co-dominant stems; or where forest health issues pose a significant threat to areas outside the WTP. Where salvage/harvesting is planned and authorized, replacement WTP of equivalent or better quality and quantity must be identified immediately to achieve the retention target.
- (5) WTPs must include, if present, remnant old growth patches and live or dead veteran trees (excluding danger trees).
- (6) WTPs must include representative larger trees for the stand and any moderate to high value wildlife trees (excluding danger trees).
- (7) Where differences exist between mapped and actual BEC subzones, subzones will be confirmed by site plan information.

Table A. Wildlife Tree Retention by BEC subzone in the East Harrison Landscape Unit.

BEC Subzone	% Wildlife Tree Retention
CWH dm (Coastal Western Hemlock, dry maritime)	9
CWH ds (Coastal Western Hemlock, dry subarctic)	8
CWH ms (Coastal Western Hemlock, moist subarctic)	8
CWH vm (Coastal Western Hemlock, very wet maritime)	12
MH mm (Mountain Hemlock, moist maritime)	7



Preamble

This order establishes objectives for Old Growth Management Areas within six Landscape Units located in the Chilliwack Forest District.

The goal of these objectives is to contribute to biological diversity at the landscape level.

This preamble is intended to provide context and background; it does not, however, form part of the order.

PROVINCE OF BRITISH COLUMBIA

Ministry of Forests, Lands and Natural Resource Operations

Ministerial Order

Land Use Objectives for Old Growth Management Areas (OGMAs) within the Alouette, Fraser Valley South, Hatzic, Pitt, Stave, and Widgeon Landscape Units (LUs) situated within the Chilliwack Forest District.

Part 1 - Interpretation

1. Pursuant to Section 93.4 of the *Land Act*, the following objectives are established as land use objectives for the purposes of the *Forest and Range Practices Act (FRPA)* and apply to OGMAs within the Alouette, Fraser Valley South, Hatzic, Pitt, Stave, and Widgeon LUs, as shown in the maps set out in Schedule A and contained in the OGMA spatial layer stored in the Geographic Warehouse (WHSE_LAND_USE_PLANNING.RMP_OGMA_LEGAL_CURRENT_SV W).
2. If there is a discrepancy between the areas shown in the maps set out in the attached Schedule A and the OGMA spatial layer stored in the Geographic Warehouse (WHSE_LAND_USE_PLANNING.RMP_OGMA_LEGAL_CURRENT_SV W), the areas as detailed in the OGMA spatial layer will take precedent.
3. Nothing in, under or arising out of this order either abrogates or derogates from any aboriginal rights, aboriginal title or treaty rights of any applicable First Nation, nor relieves the Province of any obligation to consult with any applicable First Nation.

Part 2 - Objectives

4. Objectives for Old Growth Management Areas

- (1) Retain forests in the OGMA identified in 1 in the amounts set out in Table A as shown in the maps set out in Schedule A, except where necessary for the following:
 - a) Topping or pruning of trees along boundaries necessary to improve wind firmness.
 - b) Sanitation to prevent the spread of insect infestations or diseases that pose significant threat to forested areas.
 - c) Removal of danger trees, or brushing and clearing on existing roads under active tenure within the right-of-way necessary for safety purposes.
 - d) Recreation trail and site maintenance or development to address public safety.
 - e) Felling trees for guyline clearance or tailholds. Any trees felled for tailhold or guyline purposes are to be left on site to function as coarse woody debris, unless the felled trees poses a significant risk to forest health.
- (2) In addition to 4 (1) (a) to (e), harvesting within any OGMA is permitted, provided that all the following apply:
 - (a) Harvesting is required to provide for:
 - i. a logical harvesting boundary, or
 - ii. road or bridge construction to access resource values beyond or adjacent to the OGMA and no other practicable option for road or bridge location exists;
 - (b) The area harvested does not exceed the greater of:
 - i. two hectares, or
 - ii. 5 % of the area of the OGMA; and
 - (c) The biological diversity of the OGMA is maintained.
- (3) Replacement forest is required if the total area of an OGMA that is subject to the activities pursuant to 4 (1) and 4 (2) exceeds 0.5 ha. Replacement forest must be of an equal or greater area of forest, with equivalent or greater ecological attributes, in order of priority:
 - (a) Contiguous to the OGMA in the same BEC subzone or variant; or,
 - (b) Contiguous to another OGMA in the same BEC subzone or variant.
- (4) Area harvested and the area replacing the area harvested made in accordance with 4 (3), including attributes and rationale, must be documented and submitted to the delegated decision maker at the end of each calendar year. Digital spatial data must be as 'shape file' and BC Albers projection.

Table A. Minimum requirement of BEC Variant to be retained, by Landscape Unit

Landscape Unit	BEC Variant	Minimum requirement of BEC Variant to be retained as OGMA
		%
Alouette	CWHdm	> 9
	CWHvm1	> 13
	CWHvm2	> 13
	MHmm1	> 19
Fraser Valley South	CWHdm	> 9
	CWHds1	> 9
	CWHms1	> 9
	CWHvm2	> 13
	CWHxm1	> 9
	MHmm1	> 19
	MHmm2	> 19
Hatzic	CWHdm	> 9
	CWHvm1	> 13
	CWHvm2	> 13
	MHmm1	> 19
Pitt	CWHdm	> 9
	CWHvm1	> 13
	CWHvm2	> 13
	MHmm1	> 19
Stave	CWHvm1	> 13
	CWHvm2	> 13
	MHmm1	> 19
	MHmm2	> 19
Widgeon	CWHdm	> 9
	CWHvm1	> 13
	CWHvm2	> 13
	CWHxm1	> 9
	MHmm1	> 19

Part 3 - Effective Date and Transition

5. Application of this order

- (1) This order and the land use objectives in this order take effect on the date that notice of this order is published in the Gazette.

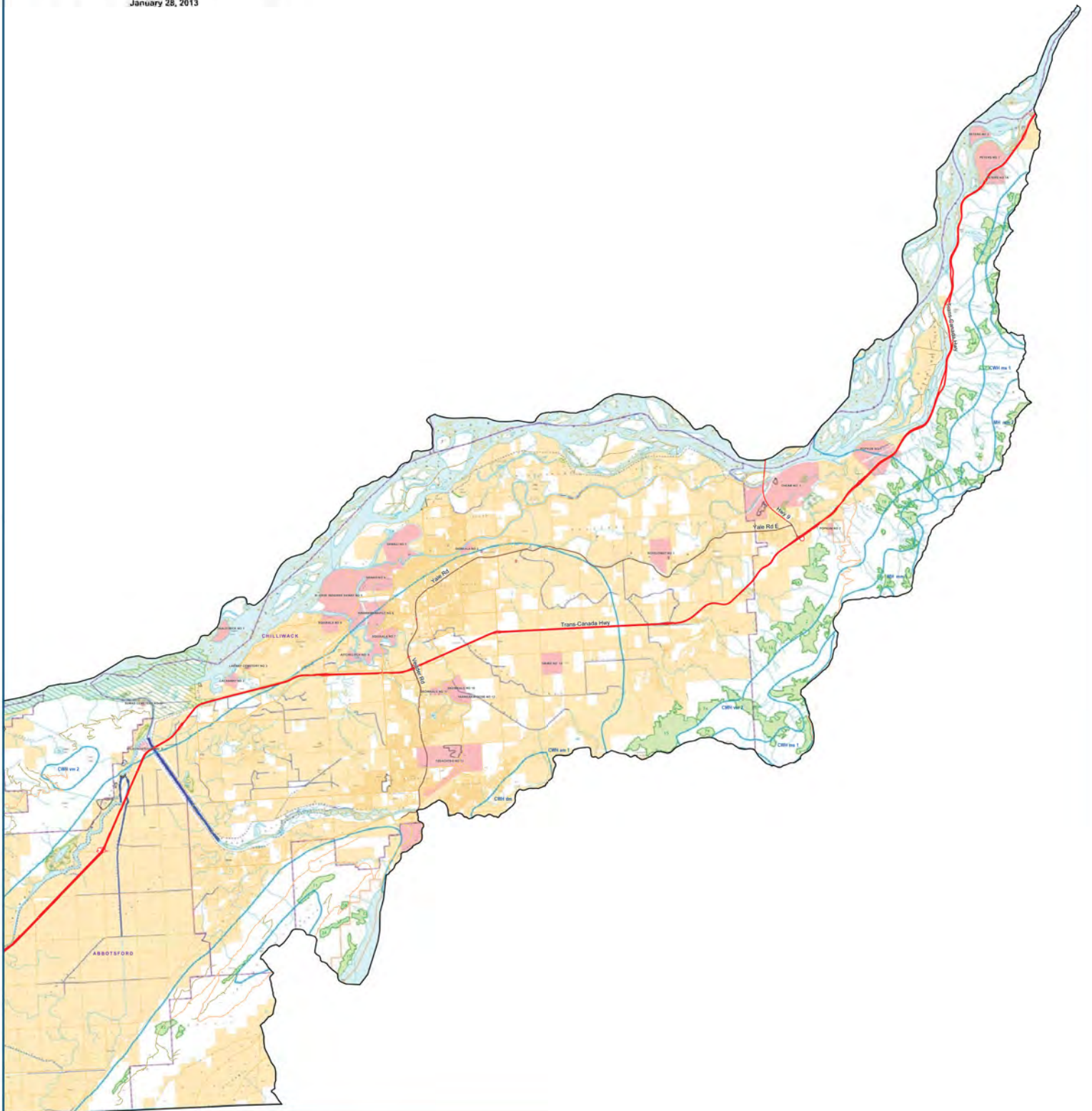


Heather MacKnight
Regional Executive Director
South Coast Region
Ministry of Forests, Lands and Natural Resource Operations

February 4, 2013
Date

Fraser Valley South Landscape Unit

January 28, 2013

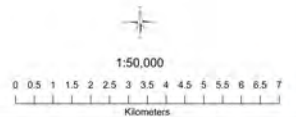


Map Study Area within the Chilliwack Forest District



Legend

- Old Growth Management Areas (draft)
- Landscape Units
- Provincial Parks
- Biogeoclimatic Zone
- Forest Service Road
- Road Permit
- Municipalities
- Wildlife Management Areas
- Private Land
- Indian Reserves



Produced for:
Regional Operations Division

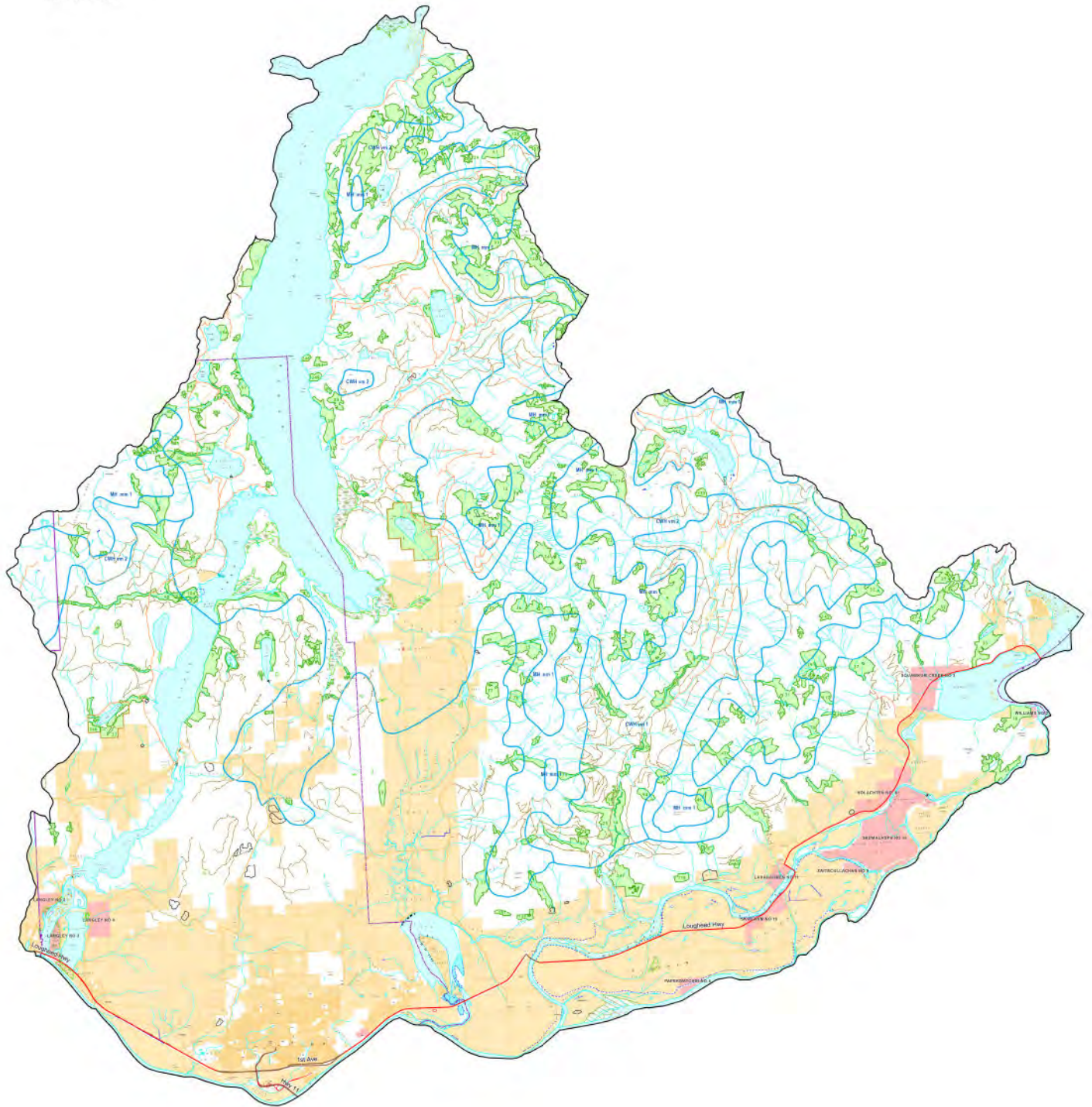
Produced by:
BRITISH COLUMBIA
Ministry of Forests, Lands
and Natural Resource Operations

(Original Signed by) _____ February 04, 2013
Regional Manager, Regional Executive Director
South Coast Region Date

Project/Inventory/Land/Forest/2012-13/RS - OGMA/Chilliwack/January_2013
Map/Chilliwack/RS/ogma_south_coast_28Jan2013.mxd
Project/Inventory/Land/Forest/2012-13/RS - OGMA/Chilliwack/January_2013
Project/Inventory/Land/Forest/2012-13/RS - OGMA/Chilliwack/January_2013
Data Created: 2013 January 28
Created by: Regional Director, South Coast

Hatzic Landscape Unit

January 28, 2013



Map Study Area within the Chilliwack Forest District



Legend

- Old Growth Management Areas (draft)
- Landscape Units
- Provincial Parks
- Biogeoclimatic Zone
- Forest Service Road
- Road Permit
- Municipalities
- Wildlife Management Areas
- Private Land
- Indian Reserves

Project Approved: February 04, 2013
Map Date: February 04, 2013
Map Scale: North-South, Regional Executive Division
Map Scale: South-South, Regional Executive Division



Produced for:
Regional Operations Division

Produced by:
BRITISH COLUMBIA
Ministry of Forests, Lands
and Natural Resource Operations

Project Name: Local Operations 2012-13-1301 - 2013-14-1301
Project Number: 1301-1301-1301-1301-1301
Project Title: Hatzic Landscape Unit - HAD 03
Date Created: 2013-01-28
Created By: Regional Operations - South Coast

Stave Landscape Unit

January 28, 2013



Map Study Area within the Chilliwack Forest District

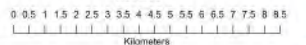


Legend

- Old Growth Management Areas (draft)
- Landscape Units
- Provincial Parks
- Biogeoclimatic Zone
- Forest Service Road
- Road Permit
- Municipalities
- Wildlife Management Areas
- Private Land
- Indian Reserves



1:80,000



Project Supervisor: February 04, 2013
 Author: Mark Anglin, Regional Forest Management Officer
 South Coast Region: DMR

Produced for:
Regional Operations Division

Produced by:
BRITISH COLUMBIA
 Ministry of Forests, Lands
 and Natural Resource Operations

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File: ORCS 17580-30/Manning

**ORDER TO ESTABLISH
A LANDSCAPE UNIT AND OBJECTIVES**

MANNING LANDSCAPE UNIT

Pursuant to Section 4 of the *Forest Practices Code of British Columbia Act*, I hereby establish the Manning Landscape Unit, an area located east of Hope, BC in the Chilliwack Forest District, effective April 14, 2004.

The boundaries of the Manning Landscape Unit are shown on the Manning Landscape Unit map, dated March 10, 2004, attached to this Order.

In addition, I hereby establish objectives for the Manning Landscape Unit, as attached to this Order, effective April 14, 2004.

(Original signed by)

**Regional Director, Coast Region,
Ministry of Sustainable Resource Management**

Date

Preamble

The goal of these objectives is to sustain biological diversity at the landscape level; permissible activities are described to streamline administrative procedures and address operational safety concerns.

First Nations traditional use of forest resources, treaty negotiations or settlements will not be limited by the following objectives.

Legal Objectives - Manning Landscape Unit

Pursuant to Section 4 of the *Forest Practices Code of British Columbia Act*, the following are landscape unit objectives for the Manning Landscape Unit.

Objective 1

1. Maintain or recruit old growth forests in established old growth management areas (OGMAs), as shown on the attached Manning Landscape Unit map dated March 10, 2004 subject to timber harvesting and road construction in accordance with section 2, 3 and 4 below.
 2. (1) Where sufficient suitable replacement forest is available in the variants listed below, timber harvesting or road construction may be undertaken in OGMAs that are >10 ha in size for operational reasons up to a cumulative maximum of:
 - i) 35 ha in variant CWHms1,
 - ii) 10 ha in variant ESSFmw, and
 - iii) 20 ha in variant MHmm2,provided that replacement OGMA of equivalent or better quality and quantity is identified in order of priority, 1) immediately adjacent to the existing OGMA, or 2) in the same variant and landscape unit as the existing OGMA.
 - (2) The criteria in 2 (1) is to apply to individual OGMAs within the categories below and must ensure that OGMA ecological attributes and spatial distribution are maintained or improved:
 - i) OGMAs >10 ha to <50 ha in size where the proposed activity affects the OGMA by <5 ha,
 - ii) OGMAs ≥50 ha to <100 ha in size where the proposed activity affects the OGMA by <10ha,
 - iii) OGMAs ≥100 ha in size where the proposed activity affects the OGMA by <10%.
 - iv) Construction of ≤500m of road or a bridge within an OGMA where there is no other practicable option. As an alternative to finding replacement area, the licensee may permanently deactivate and rehabilitate a temporary road or bridge site within four years after construction.
 - (3) Where OGMA boundary adjustments and replacement areas are required under section 2 (1) and (2) they must be documented, mapped and submitted to the satisfaction of the Delegated Decision Maker (DDM) at the end of each calendar year for his/her approval.
 - (4) The provisions in section 2 (1) and (2) do not apply to the following OGMAs #3, 4, 5, 59, 73, 86, 92, 126, 129, 135, 136, 138.
3. Permissible Activities:
 - (1) Timber harvest may occur to prevent the spread of insect infestations or diseases that pose a significant threat to forested areas outside of OGMAs. Salvage within OGMAs will be done in a manner that retains as many old growth forest attributes as possible.

- (2) Construction of rock quarries and gravel pits under authority of forest tenure where the development will be located immediately adjacent to existing roads under tenure and will affect the OGMA by <0.5 ha.
 - (3) Intrusions, other than those specified, that affect an OGMA by less than 0.5 hectare in total.
 - (4) Where OGMA replacement forest is required as a result of activities under 3 (1) or (2), it must be of equivalent or better quality and quantity and be identified in order of priority, 1) immediately adjacent to the existing OGMA, or 2) in the same variant and landscape unit as the existing OGMA; such that OGMA ecological attributes and spatial distribution are maintained or improved. OGMA replacement areas must be documented, mapped and submitted to the satisfaction of the DDM at the end of each calendar year for his/her approval.
4. Permissible Activities for Safety Purposes:
- (1) Maintenance, deactivation, removal of danger trees, or brushing and clearing on existing roads under active tenure within the right-of-way for safety purposes.
 - (2) Felling of guyline clearance, tailhold anchor trees, or danger trees (except high value wildlife trees) along cutblock boundaries or within the right of way on new road/bridge alignments to meet safety requirements.

Objective 2

Maintain stand level structural diversity by retaining wildlife tree patches (WTP). Cutblocks for which harvesting has been completed by each licensee by tenure will retain adequate amounts of wildlife tree patches to ensure that over each 3 year period, commencing on the date the objectives are established, the target percentage as noted in Table A is achieved. In addition:

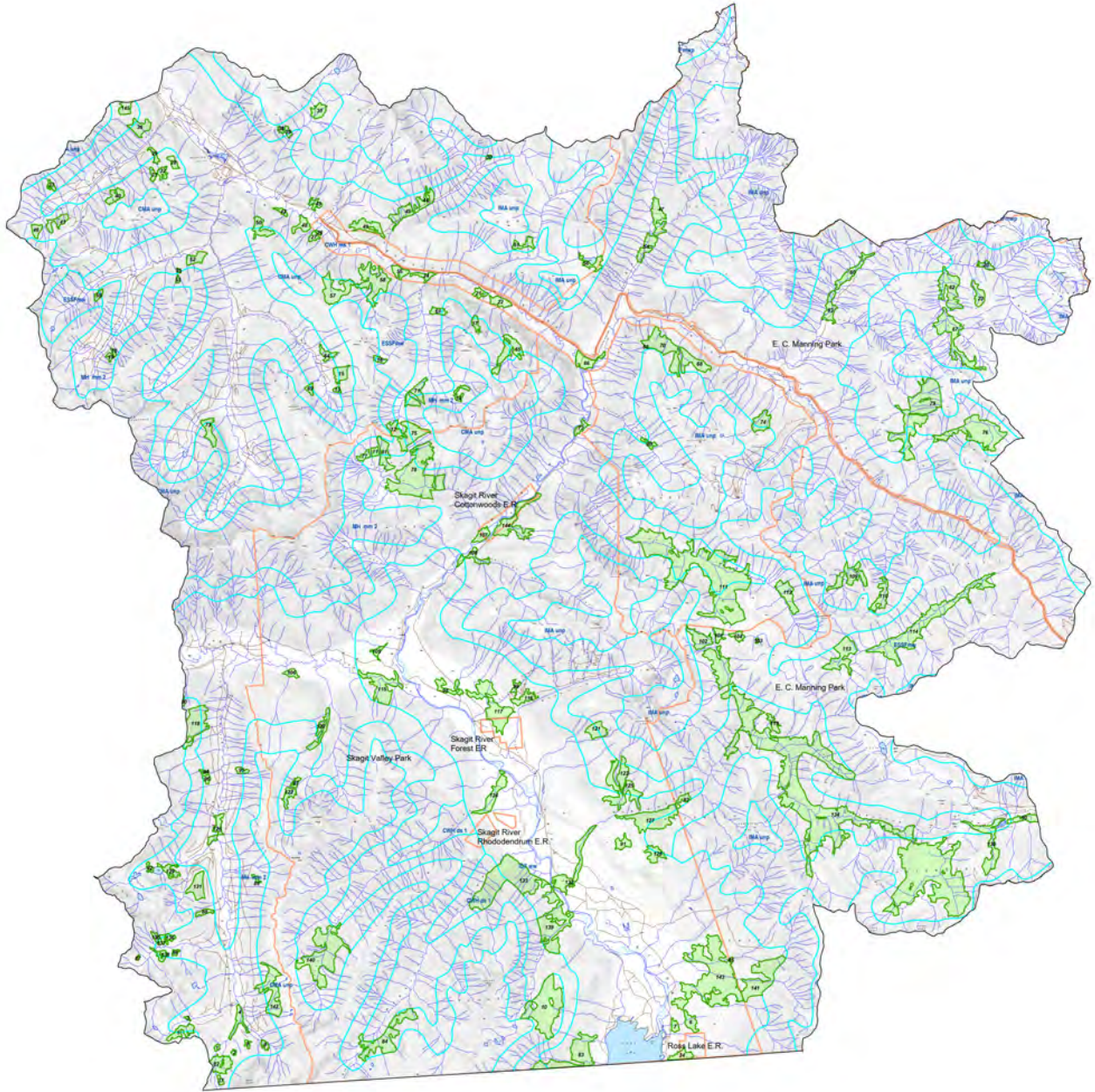
- (1) WTPs must be well distributed across the BEC subzone and located within or immediately adjacent to a cutblock.
- (2) Each cutblock >10 ha in size must have a minimum of 2% wildlife tree retention, except in the ESSFmw subzone.
- (3) No timber harvesting, including single tree selection, is to occur within WTPs for at least one rotation, except as noted in (4) below.
- (4) Salvage of windthrown timber and harvesting of remaining standing stems is only permitted within WTPs where catastrophic windthrow exceeds 50% of the dominant or co-dominant stems; or where forest health issues pose a significant threat to areas outside the WTP. Where salvage/harvesting is planned and authorized, replacement WTP of equivalent or better quality and quantity must be identified immediately to achieve the retention target.
- (5) WTPs must include, if present, remnant old growth patches and live or dead veteran trees (excluding danger trees).
- (6) WTPs must include representative larger trees for the stand and any moderate to high value wildlife trees (excluding danger trees).
- (7) Where differences exist between mapped and actual BEC subzones, subzones will be confirmed by site plan information.

Table A. Wildlife Tree Retention by BEC subzone in the Manning Landscape Unit.

BEC Subzone	% Wildlife Tree Retention
CWH ds (Coastal Western Hemlock, dry subaritime)	2
CWH ms (Coastal Western Hemlock, moist subaritime)	4
ESSF mw (Engelmann Spruce Subalpine Fir moist warm subzone)	0
MH mm (Mountain Hemlock, moist maritime)	2

Manning Landscape Unit

July 12th, 2007



Map Study Area within Chilliwack Forest District



LEGEND

- Landscape Unit Boundary
- Old Growth Management Area
- Biogeoclimatic Zone
- Protected Area
- Roads
- Creeks
- Contour Lines (20m Interval)

Notes



Produced for:
Regional Client Services Division

Produced by:
BRITISH COLUMBIA
Integrated Land Management Bureau
Lower Mainland Service Center

Filepath: SPROJ\B\m\m\chilliwack\manning\manning.LU_VLM_July122007.mxd
Projection: GCSNAD83 - Albers Equal Area - NAD 83
Date Created: 2007-07-12
Created by: Survey Contact Centre by HEI



File: ORCS 17580-30/Silverhope

**ORDER TO ESTABLISH
A LANDSCAPE UNIT AND OBJECTIVES**

SILVERHOPE LANDSCAPE UNIT

Pursuant to Section 4 of the *Forest Practices Code of British Columbia Act*, I hereby establish the Silverhope Landscape Unit, an area located south of Hope, BC in the Chilliwack Forest District, effective April 14, 2004.

The boundaries of the Silverhope Landscape Unit are shown on the Silverhope Landscape Unit map dated March 10, 2004, attached to this Order.

In addition, I hereby establish objectives for the Silverhope Landscape Unit, as attached to this Order, effective April 14, 2004.

(Original signed by)

**Regional Director, Coast Region,
Ministry of Sustainable Resource Management**

Date

Preamble

The goal of these objectives is to sustain biological diversity at the landscape level; permissible activities are described to streamline administrative procedures and address operational safety concerns.

First Nations traditional use of forest resources, treaty negotiations or settlements will not be limited by the following objectives.

Legal Objectives - Silverhope Landscape Unit

Pursuant to Section 4 of the *Forest Practices Code of British Columbia Act*, the following are landscape unit objectives for the Silverhope Landscape Unit.

Objective 1

1. Maintain or recruit old growth forests in established old growth management areas (OGMAs), as shown on the attached Silverhope Landscape Unit map dated March 10, 2004 subject to timber harvesting and road construction in accordance with section 2, 3 and 4 below.
 2. (1) Where sufficient suitable replacement forest is available in the variants listed below, timber harvesting or road construction may be undertaken in OGMAs that are >10 ha in size for operational reasons up to a cumulative maximum of:
 - i) 6 ha in variant CWHds1,
 - ii) 90 ha in variant CWHms1, and
 - iii) 60 ha in variant MHmm2,provided that replacement OGMA of equivalent or better quality and quantity is identified in order of priority, 1) immediately adjacent to the existing OGMA, or 2) in the same variant and landscape unit as the existing OGMA.
 - (2) The criteria in 2 (1) is to apply to individual OGMAs within the categories below and must ensure that OGMA ecological attributes and spatial distribution are maintained or improved:
 - i) OGMAs >10 ha to <50 ha in size where the proposed activity affects the OGMA by <5 ha,
 - ii) OGMAs ≥50 ha to <100 ha in size where the proposed activity affects the OGMA by <10ha,
 - iii) OGMAs ≥100 ha in size where the proposed activity affects the OGMA by <10%.
 - iv) Construction of ≤500m of road or a bridge within an OGMA where there is no other practicable option. As an alternative to finding replacement area, the licensee may permanently deactivate and rehabilitate a temporary road or bridge site within four years after construction.
 - (3) Where OGMA boundary adjustments and replacement areas are required under section 2 (1) and (2) they must be documented, mapped and submitted to the satisfaction of the Delegated Decision Maker (DDM) at the end of each calendar year for his/her approval.
 - (4) The provisions in section 2 (1) and (2) do not apply to the following OGMAs #46, 76, 166.
3. Permissible Activities:
 - (1) Timber harvest may occur to prevent the spread of insect infestations or diseases that pose a significant threat to forested areas outside of OGMAs. Salvage within OGMAs will be done in a manner that retains as many old growth forest attributes as possible.

- (2) Construction of rock quarries and gravel pits under authority of forest tenure where the development will be located immediately adjacent to existing roads under tenure and will affect the OGMA by <0.5 ha.
 - (3) Intrusions, other than those specified, that affect an OGMA by less than 0.5 hectare in total.
 - (4) Where OGMA replacement forest is required as a result of activities under 3 (1) or (2), it must be of equivalent or better quality and quantity and be identified in order of priority, 1) immediately adjacent to the existing OGMA, or 2) in the same variant and landscape unit as the existing OGMA; such that OGMA ecological attributes and spatial distribution are maintained or improved. OGMA replacement areas must be documented, mapped and submitted to the satisfaction of the DDM at the end of each calendar year for his/her approval.
4. Permissible Activities for Safety Purposes:
- (1) Maintenance, deactivation, removal of danger trees, or brushing and clearing on existing roads under active tenure within the right-of-way for safety purposes.
 - (2) Felling of guyline clearance, tailhold anchor trees, or danger trees (except high value wildlife trees) along cutblock boundaries or within the right of way on new road/bridge alignments to meet safety requirements.

Objective 2

Maintain stand level structural diversity by retaining wildlife tree patches (WTP). Cutblocks for which harvesting has been completed by each licensee by tenure will retain adequate amounts of wildlife tree patches to ensure that over each 3 year period, commencing on the date the objectives are established, the target percentage as noted in Table A is achieved. In addition:

- (1) WTPs must be well distributed across the BEC subzone and located within or immediately adjacent to a cutblock.
- (2) Each cutblock >10 ha in size must have a minimum of 2% wildlife tree retention.
- (3) No timber harvesting, including single tree selection, is to occur within WTPs for at least one rotation, except as noted in (4) below.
- (4) Salvage of windthrown timber and harvesting of remaining standing stems is only permitted within WTPs where catastrophic windthrow exceeds 50% of the dominant or co-dominant stems; or where forest health issues pose a significant threat to areas outside the WTP. Where salvage/harvesting is planned and authorized, replacement WTP of equivalent or better quality and quantity must be identified immediately to achieve the retention target.
- (5) WTPs must include, if present, remnant old growth patches and live or dead veteran trees (excluding danger trees).
- (6) WTPs must include representative larger trees for the stand and any moderate to high value wildlife trees (excluding danger trees).
- (7) Where differences exist between mapped and actual BEC subzones, subzones will be confirmed by site plan information.

Table A. Wildlife Tree Retention by BEC subzone in the Silverhope Landscape Unit.

BEC Subzone	% Wildlife Tree Retention
CWH dm (Coastal Western Hemlock, dry maritime)	5
CWH ds (Coastal Western Hemlock, dry subaritime)	6
CWH ms (Coastal Western Hemlock, moist subaritime subzone)	6
MH mm (Mountain Hemlock, moist maritime)	3

Silverhope Landscape Unit

Ministry of Sustainable Resource Management

- Landscape Unit Boundary
- Biogeoclimatic Ecosystem Boundary
- Protected Area
- Roads
- Water
- 20m Contours
- Lake
- River
- Swamp

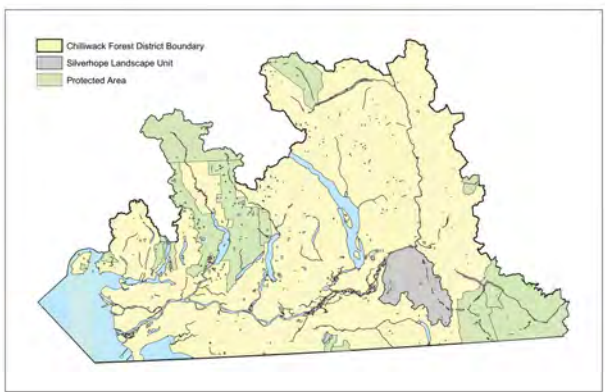
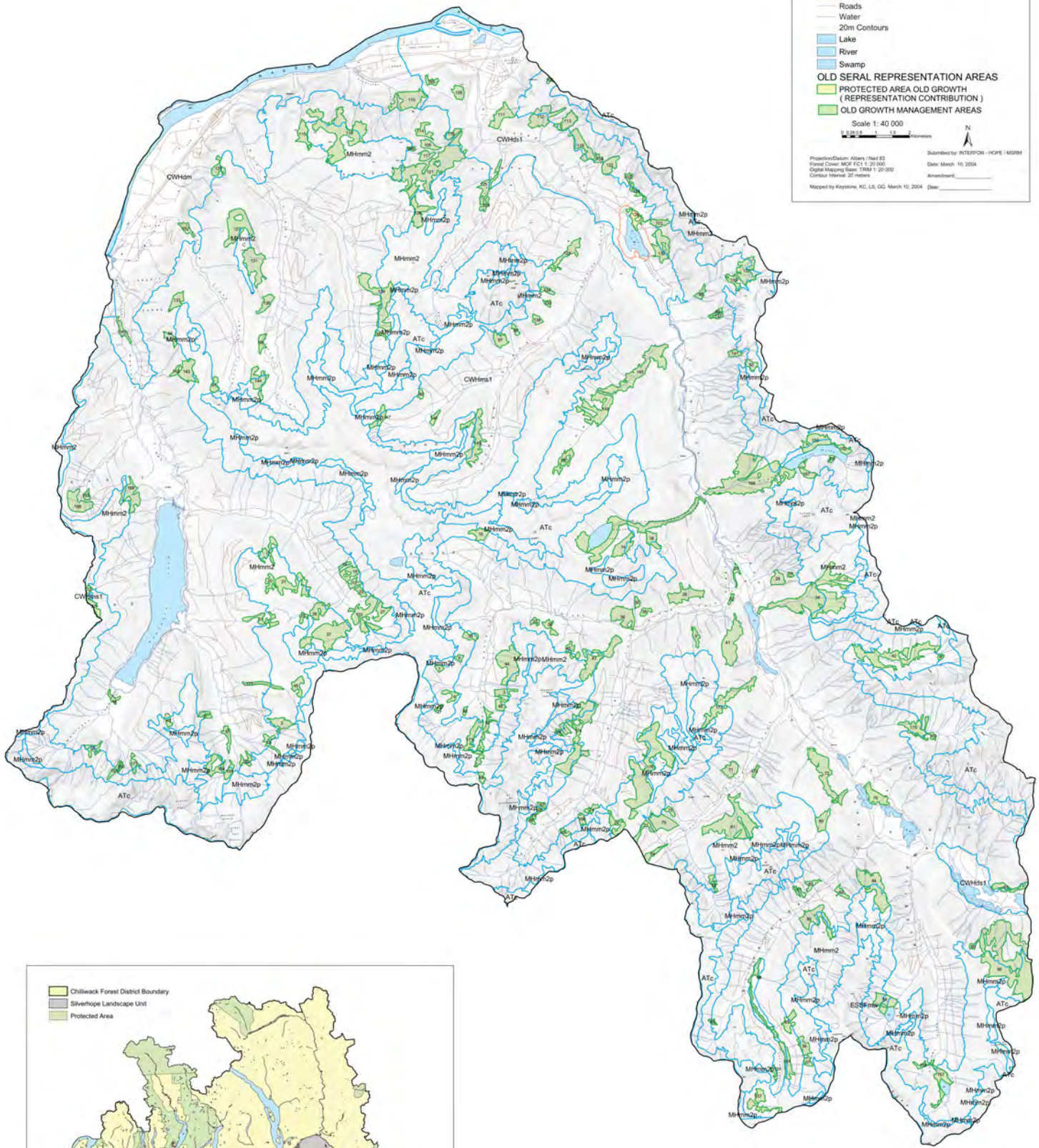
OLD SERAL REPRESENTATION AREAS

- PROTECTED AREA OLD GROWTH (REPRESENTATION CONTRIBUTION)
- OLD GROWTH MANAGEMENT AREAS

Scale 1: 40 000

Projection: Datum: Adams / Nad 83
 Road Cover: WDF T.C. 1: 20 000
 Digital Mapset: Base: TM04 1: 20 000
 Contour Interval: 20 meters

Submitted by: INTERFOR - HCP# 15508
 Date: March 10, 2004
 Assessment: _____
 Mapped by: Klaymore, K.C. L.S. GG March 10, 2004 Date: _____





File: ORCS 17580-55/ Fraser Canyon

**ORDER TO ESTABLISH
A LANDSCAPE UNIT AND OBJECTIVES**

SPUZZUM LANDSCAPE UNIT

Pursuant to Section 4 of the *Forest Practices Code of British Columbia Act*, I hereby establish the Spuzzum Landscape Unit, an area located on the west side of the Fraser Canyon, Chilliwack Forest District, effective January 13, 2004.

The boundaries of the Spuzzum Landscape Unit are shown on the Spuzzum Landscape Unit map, dated December 11, 2004, attached to this Order.

In addition, I hereby establish objectives for the Spuzzum Landscape Unit, as attached to this Order, effective January 13, 2004, 2004.

(Original signed by)

**Regional Director, Coast Region,
Ministry of Sustainable Resource Management**

Date

Legal Objectives for the Spuzzum Landscape Unit

Pursuant to section 4 of the *Forest Practices Code of British Columbia Act*, the following are landscape unit objectives for the Spuzzum Landscape Unit. The goal of these objectives is to sustain biological diversity at the landscape level; exemptions are included to streamline administrative procedures and address operational safety concerns.

First Nations traditional use of forest resources, treaty negotiations or settlements will not be limited by the following objectives.

Objective 1

1. Maintain or recruit old growth forests in designated old growth management areas (OGMAs), as shown on the attached Spuzzum Landscape Unit map dated December 11, 2003. Timber harvesting, including salvage, single tree selection, topping for cone harvesting, and commercial gathering of botanical forest products, will not be permitted within OGMAs except as specified in section 2 and 3 below.
2. The Delegated Decision Maker (DDM) may allow operations to occur within an OGMA for reasons such as:
 - (1) To prevent the spread of insect infestations or diseases that pose a significant threat to forested areas outside of OGMAs. This will be done in a manner that retains as many old growth forest attributes as possible.
 - (2) Construction of roads and yarding corridors if no other practicable option exists.
3. Exemptions:
 - (1) Maintenance, deactivation, removal of danger trees, or brushing and clearing on existing roads under active tenure within the right-of-way for safety purposes.
 - (2) Felling of guyline clearance, tailhold anchor trees, or danger trees (except high value wildlife trees) along cutblock boundaries or within the right of way on new road/bridge alignments to meet safety requirements.
 - (3) OGMAs that are >10 ha in size may be modified for operational reasons up to a cumulative maximum of :
 - a) 10 ha in variant CWHds1,
 - b) 80 ha in variant CWHms1,
 - c) 10 ha in variant IDFww, and
 - d) 45 ha in variant MHmm2,provided that replacement OGMA of equivalent or better quality and quantity is identified in order of priority, 1) immediately adjacent to the existing OGMA, or 2) in the same variant and landscape unit as the existing OGMA; such that OGMA ecological attributes and spatial distribution are maintained or improved, in one of the following categories:
 - i) OGMAs >10 ha to <50 ha in size where the proposed development affects the OGMA by <5 ha,
 - ii) OGMAs ≥50 ha to <100 ha in size where the proposed development affects the OGMA by <10ha,

- iii) OGMA's ≥ 100 ha in size where the proposed development affects the OGMA by $< 10\%$.
 - iv) Construction of ≤ 500 m of road or a bridge within an OGMA where there is no other practicable option. As an alternative to finding replacement area, the licensee may permanently deactivate or rehabilitate a temporary road or bridge site within four years after construction.
 - v) Construction of rock quarries and gravel pits under authority of forest tenure where the development will be located immediately adjacent to existing roads under tenure and will affect the OGMA by < 0.5 ha.
- (4) Intrusions, other than those specified in (3) above, that affect an OGMA by less than 0.5 hectare in total.

4. Exemption 3(3) above does not apply to the following OGMA's: #41, 47.

Objective 2

Maintain stand level structural diversity by retaining wildlife tree patches (WTP). Cutblocks for which harvesting has been completed by each licensee by tenure will retain adequate amounts of wildlife tree patches to ensure that over each 3 year period, commencing on the date the objectives are established, the target percentage as noted in Table A is achieved. In addition:

- (1) WTPs must be well distributed across the BEC subzone and located within or immediately adjacent to a cutblock.
- (2) Each cutblock > 10 ha in size must have a minimum of 2% wildlife tree retention.
- (3) No timber harvesting, including single tree selection, is to occur within WTPs for at least one rotation, except as noted in (4) below.
- (4) Salvage of windthrown timber and harvesting of remaining standing stems is only permitted within WTPs where catastrophic windthrow exceeds 50% of the dominant or co-dominant stems; or where forest health issues pose a significant threat to areas outside the WTP. Where salvage/harvesting is planned and authorized, replacement WTP of equivalent or better quality and quantity must be identified immediately to achieve the retention target.
- (5) WTPs must include, if present, remnant old growth patches and live or dead veteran trees (excluding danger trees).
- (6) WTPs must include representative larger trees for the stand and any existing moderate to high value wildlife trees (excluding danger trees).
- (7) Where differences exist between mapped and actual BEC subzones, subzones will be confirmed by site plan information.

Table A. Wildlife Tree Retention by BEC subzone in the Spuzzum Landscape Unit.

BEC Subzone	% Wildlife Tree Retention
CWH ds (Coastal Western Hemlock, dry subarctic)	10
CWH ms (Coastal Western Hemlock, moist subarctic)	10
IDF ww (Interior Douglas-fir, wet warm subzone)	6
MH mm (Mountain Hemlock, moist maritime)	4

Spuzzum Landscape Unit

Province of British Columbia
Ministry of Sustainable Resource Management

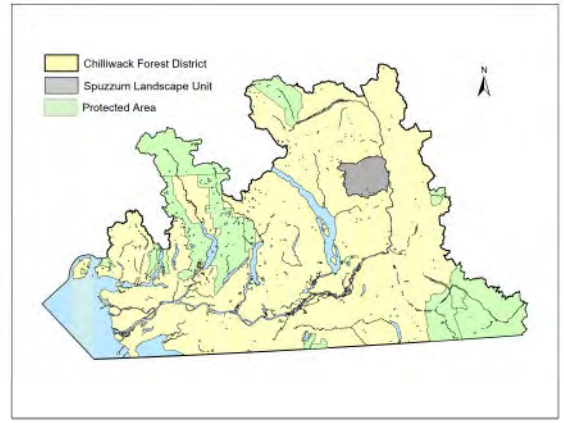
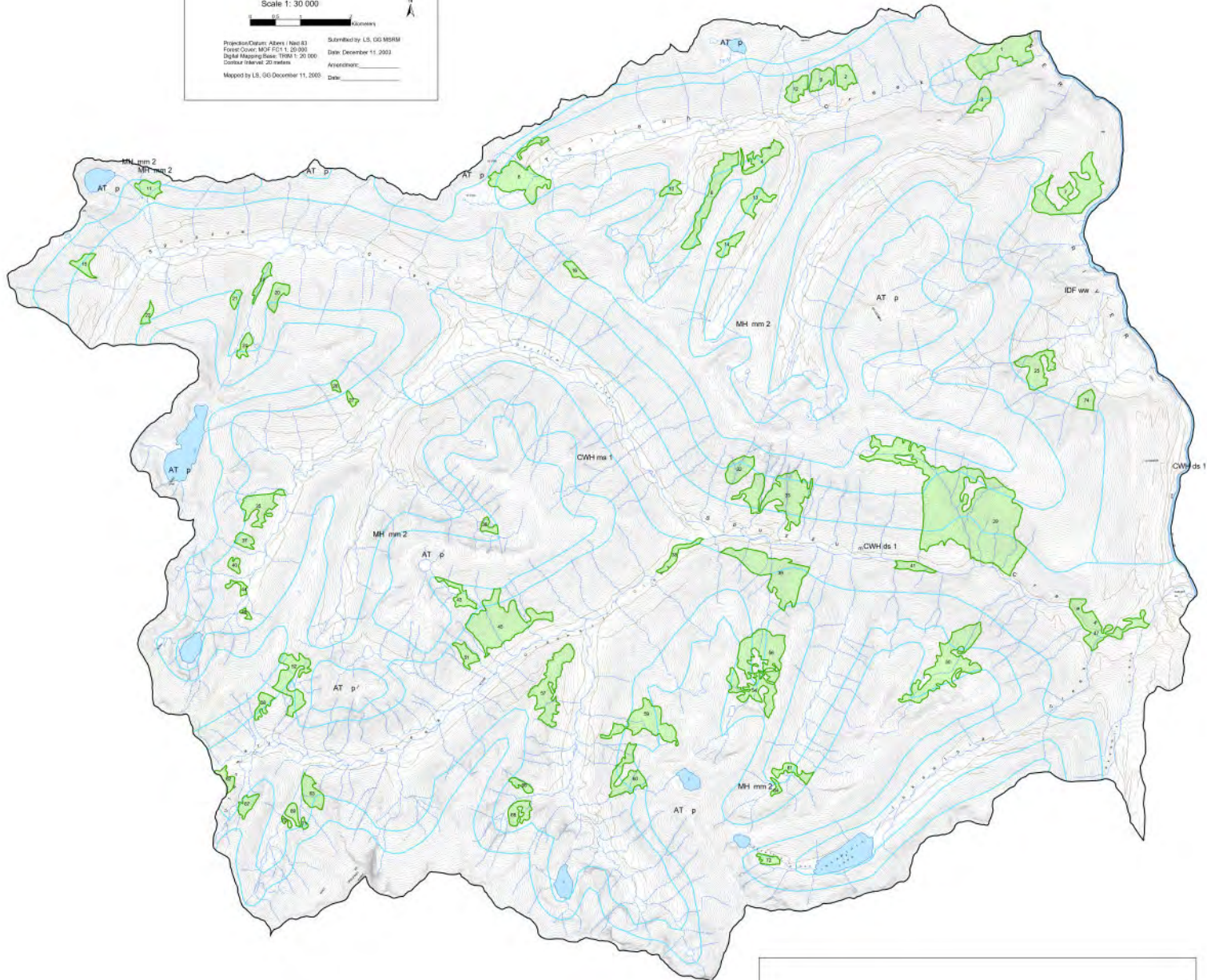
- Landscape Unit Boundary
- Biogeoclimatic Ecosystem Boundary
- Roads
- Water
- 20m Contours
- Lake
- River
- Swamp

OLD SERAL REPRESENTATION AREAS

- OLD GROWTH MANAGEMENT AREAS

Scale 1: 30 000

Prepared/Checked: Albert / Neil 83 Submitted by: L.S. GG MRRM
 Forest Cover: MCF FCH 1, 20 000 Date: December 11, 2003
 Digital Mapping Base: 10000 1: 20 000 Contour Interval: 20 metres
 Mapped by: L.S. GG December 11, 2003 Date:





File: ORCS 17580-30/TRET

**ORDER TO ESTABLISH
A LANDSCAPE UNIT AND OBJECTIVES**

TRETHEWAY LANDSCAPE UNIT

Pursuant to Section 4 of the *Forest Practices Code of British Columbia Act*, I hereby establish the Tretheway Landscape Unit, an area located near Harrison Lake, effective June 24th, 2005.

The boundaries of the Tretheway Landscape Unit are shown on the Tretheway Landscape Unit map dated 2 December 2004 accompanying this Order.

In addition, I hereby establish Landscape Unit Objectives for the Tretheway Landscape Unit, as attached to this Order, effective June 24th, 2005.

(Original signed by)

June 7th, 2005

**Regional Director, Coast Region,
Ministry of Sustainable Resource Management**

Date

Preamble

The goal of these objectives is to sustain biological diversity at the landscape level; permissible activities are described to streamline administrative procedures and address operational safety concerns.

First Nations traditional use of forest resources, treaty negotiations or settlements will not be limited by the following objectives.

Legal Objectives - Tretheway Landscape Unit

Pursuant to Section 4 of the *Forest Practices Code of British Columbia Act*, the following are Landscape Unit Objectives for the Tretheway Landscape Unit.

Objective 1

1. Maintain or recruit old growth forests in established old growth management areas (OGMAs), as shown on the attached Tretheway Landscape Unit map dated 2 December 2004 subject to timber harvesting and road construction in accordance with section 2, 3 and 4 below.
 2. (1) Where sufficient suitable replacement forest is available in the variants listed below, timber harvesting or road construction may be undertaken in OGMAs that are >10 ha in size for operational reasons up to a cumulative maximum of:
 - i) 10 ha in variant CWHds1,
 - ii) 15 ha in variant CWHms1, and
 - iii) 10 ha in variant MHmm2,provided that replacement OGMA of equivalent or better quality and quantity is identified in order of priority, 1) immediately adjacent to the existing OGMA, or 2) in the same variant and landscape unit as the existing OGMA.
 - (2) The criteria in 2 (1) is to apply to individual OGMAs within the categories below and must ensure that OGMA ecological attributes and spatial distribution are maintained or improved:
 - i) OGMAs >10 ha to <50 ha in size where the proposed activity affects the OGMA by <5 ha,
 - ii) OGMAs ≥50 ha to <100 ha in size where the proposed activity affects the OGMA by <10ha,
 - iii) OGMAs ≥100 ha in size where the proposed activity affects the OGMA by <10%.
 - iv) Construction of ≤500m of road or a bridge within an OGMA where there is no other practicable option. As an alternative to finding replacement area, the licensee may permanently deactivate and rehabilitate a temporary road or bridge site within four years after construction.
 - (3) Where OGMA boundary adjustments and replacement areas are required under section 2 (1) and (2) they must be documented, mapped and submitted to the satisfaction of the Delegated Decision Maker (DDM) at the end of each calendar year for his/her approval.
 - (4) The provisions in section 2 (1) and (2) do not apply to the following OGMAs # 13, 23, 33, 47, 49, 59, 69, 75, and the old mapped portion of all OGMAs in the CWHds1.
3. Permissible Activities:
 - (1) Timber harvest may occur to prevent the spread of insect infestations or diseases that pose a significant threat to forested areas outside of OGMAs. Salvage within OGMAs will be done in a manner that retains as many old growth forest attributes as possible.

- (2) Construction of rock quarries and gravel pits under authority of forest tenure where the development will be located immediately adjacent to existing roads under tenure and will affect the OGMA by <0.5 ha.
- (3) Intrusions, other than those specified, that affect an OGMA by less than 0.5 hectare in total.
- (4) Where OGMA replacement forest is required as a result of activities under 3 (1) or (2), it must be of equivalent or better quality and quantity and be identified in order of priority, 1) immediately adjacent to the existing OGMA, or 2) in the same variant and landscape unit as the existing OGMA; such that OGMA ecological attributes and spatial distribution are maintained or improved. OGMA replacement areas must be documented, mapped and submitted to the satisfaction of the DDM at the end of each calendar year for his/her approval.

4. Permissible Activities for Safety Purposes:

- (1) Maintenance, deactivation, removal of danger trees, or brushing and clearing on existing roads under active tenure within the right-of-way for safety purposes.
- (2) Felling of guyline clearance, tailhold anchor trees, or danger trees (except high value wildlife trees) along cutblock boundaries or within the right of way on new road/bridge alignments to meet safety requirements.

Objective 2

Maintain stand level structural diversity by retaining wildlife tree patches (WTP). Cutblocks for which harvesting has been completed by each licensee by tenure will retain adequate amounts of wildlife tree patches to ensure that over each 3 year period, commencing on the date the objectives are established, the target percentage as noted in Table A is achieved. In addition:

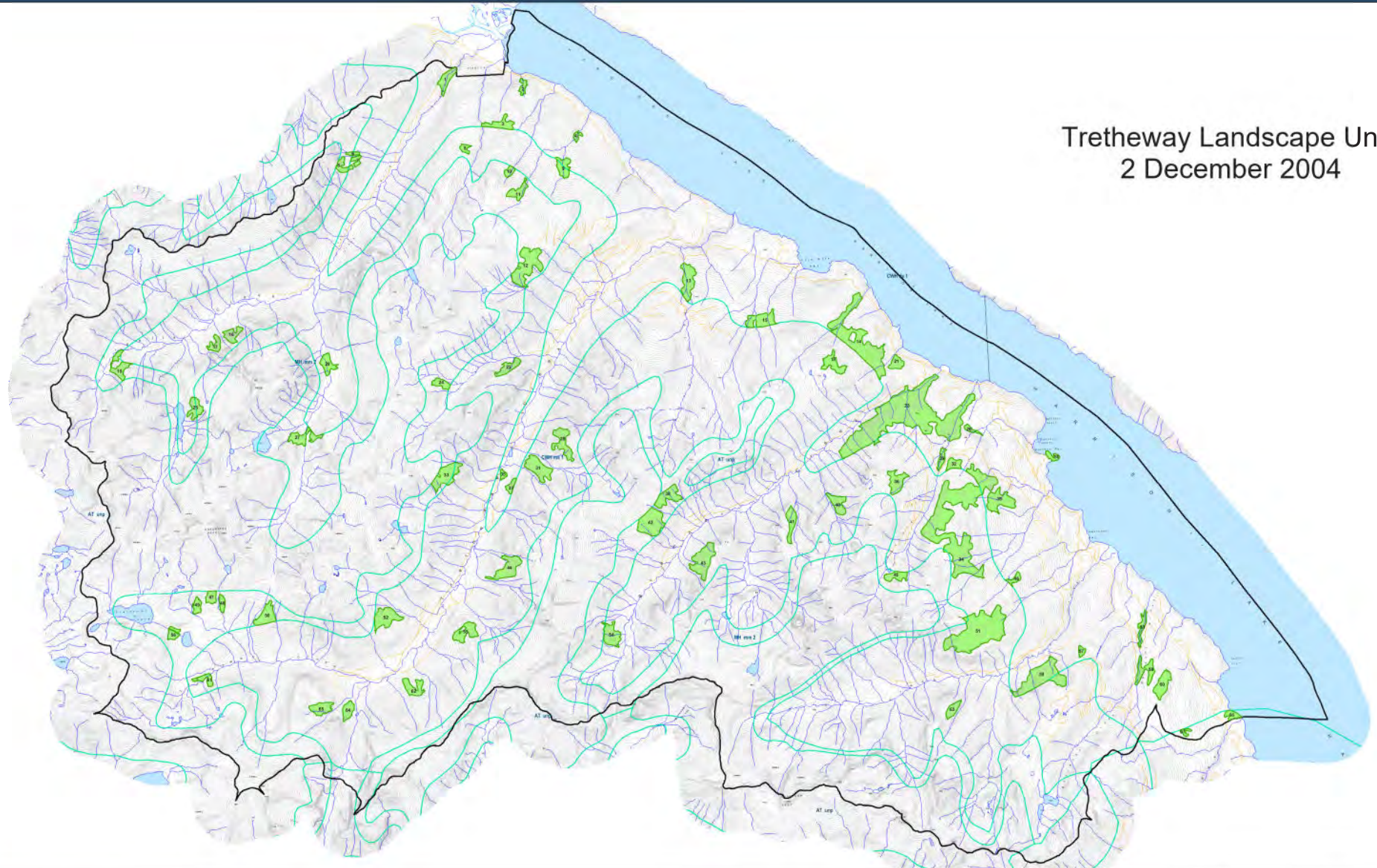
- (1) WTPs must be well distributed across the BEC subzone and located within or immediately adjacent to a cutblock.
- (2) Each cutblock >10 ha in size must have a minimum of 2% wildlife tree retention.
- (3) No timber harvesting, including single tree selection, is to occur within WTPs for at least one rotation, except as noted in (4) below.
- (4) Salvage of windthrown timber and harvesting of remaining standing stems is only permitted within WTPs where catastrophic windthrow exceeds 50% of the dominant or co-dominant stems; or where forest health issues pose a significant threat to areas outside the WTP. Where salvage/harvesting is planned and authorized, replacement WTP of equivalent or better quality and quantity must be identified immediately to achieve the retention target.
- (5) WTPs must include, if present, remnant old growth patches and live or dead veteran trees (excluding danger trees).
- (6) WTPs must include representative larger trees for the stand and any moderate to high value wildlife trees (excluding danger trees).
- (7) Where differences exist between mapped and actual BEC subzones, subzones will be confirmed by site plan information.

Table A. Wildlife Tree Retention by BEC subzone in the Tretheway Landscape Unit.

BEC Subzone	% Wildlife Tree Retention
CWH ds (Coastal Western Hemlock, dry subarctic)	10
CWH ms (Coastal Western Hemlock, moist subarctic)	6
MH mm (Mountain Hemlock, moist maritime)	2

Tretheway Landscape Unit










2 December 2004



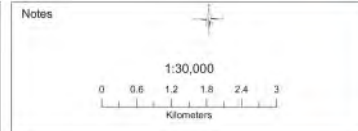
Map Study Area within the Chilliwack Forest District




Legend

- | | | | |
|---|-------------------------------|---|-----------------------------|
|  | OLD GROWTH MANAGEMENT AREA |  | Road |
|  | OLD SERAL REPRESENTATION AREA |  | Water Course |
|  | Landscape Unit Boundary |  | Contour Line (20m Interval) |
|  | Protected Area |  | Waterbody |
|  | Biogeoclimatic Zone | | |

Submitted by: AM, MSRM
 (original signed by)
 Regional Director, Coast Region,
 Ministry of Sustainable Resource Management
 (7 June 2005)
 Date



Produced for:
Resource Management Division

Produced by:

BRITISH COLUMBIA
 Ministry of Sustainable Resource Management
 Business Solutions Branch

SPROJL B/mnd/emp/chilliwack/tretheway/mxd/TrethewayLU_LM_Dec022004z.mxd
 Projection: Datum: Albers Equal Area - NAD 83
 Date Created: 2004-Dec-02
 Created for: Surrey Contract Centre by Instar GIS Solutions



File: ORCS 17580-30/WHAR

**ORDER TO ESTABLISH
A LANDSCAPE UNIT AND OBJECTIVES**

WEST HARRISON LANDSCAPE UNIT

Pursuant to Section 4 of the *Forest Practices Code of British Columbia Act*, I hereby establish the West Harrison Landscape Unit, an area located near Harrison Lake and Harrison Hot Springs, effective June 24th, 2005.

The boundaries of the West Harrison Landscape Unit are shown on the West Harrison Landscape Unit map dated 2 December 2004 accompanying this Order.

In addition, I hereby establish Landscape Unit Objectives for the West Harrison Landscape Unit, as attached to this Order, effective June 24th, 2005.

(Original signed by)

June 7th, 2005

**Regional Director, Coast Region,
Ministry of Sustainable Resource Management**

Date

Preamble

The goal of these objectives is to sustain biological diversity at the landscape level; permissible activities are described to streamline administrative procedures and address operational safety concerns.

First Nations traditional use of forest resources, treaty negotiations or settlements will not be limited by the following objectives.

Legal Objectives – West Harrison Landscape Unit

Pursuant to Section 4 of the *Forest Practices Code of British Columbia Act*, the following are Landscape Unit Objectives for the West Harrison Landscape Unit.

Objective 1

1. Maintain or recruit old growth forests in established old growth management areas (OGMAs), as shown on the attached West Harrison Landscape Unit map dated 2 December 2004 subject to timber harvesting and road construction in accordance with section 2, 3 and 4 below.
 2. (1) Where sufficient suitable replacement forest is available in the variants listed below, timber harvesting or road construction may be undertaken in OGMAs that are >10 ha in size for operational reasons up to a cumulative maximum of:
 - i) 50 ha in variant CWHdm,
 - ii) 15 ha in variant CWHvm2, and
 - iii) 10 ha in variant MHmm1,provided that replacement OGMA of equivalent or better quality and quantity is identified in order of priority, 1) immediately adjacent to the existing OGMA, or 2) in the same variant and landscape unit as the existing OGMA.
 - (2) The criteria in 2 (1) is to apply to individual OGMAs within the categories below and must ensure that OGMA ecological attributes and spatial distribution are maintained or improved:
 - i) OGMAs >10 ha to <50 ha in size where the proposed activity affects the OGMA by <5 ha,
 - ii) OGMAs ≥50 ha to <100 ha in size where the proposed activity affects the OGMA by <10ha,
 - iii) OGMAs ≥100 ha in size where the proposed activity affects the OGMA by <10%.
 - iv) Construction of ≤500m of road or a bridge within an OGMA where there is no other practicable option. As an alternative to finding replacement area, the licensee may permanently deactivate and rehabilitate a temporary road or bridge site within four years after construction.
 - (3) Where OGMA boundary adjustments and replacement areas are required under section 2 (1) and (2) they must be documented, mapped and submitted to the satisfaction of the Delegated Decision Maker (DDM) at the end of each calendar year for his/her approval.
 - (4) The provisions in section 2 (1) and (2) do not apply to the following OGMAs #3, 10, 19, 37, 99, 101, 124 and the mapped old forest portion of all OGMAs in CWHdm.
3. Permissible Activities:
 - (1) Timber harvest may occur to prevent the spread of insect infestations or diseases that pose a significant threat to forested areas outside of OGMAs. Salvage within OGMAs will be done in a manner that retains as many old growth forest attributes as possible.

- (2) Construction of rock quarries and gravel pits under authority of forest tenure where the development will be located immediately adjacent to existing roads under tenure and will affect the OGMA by <0.5 ha.
- (3) Intrusions, other than those specified, that affect an OGMA by less than 0.5 hectare in total.
- (4) Where OGMA replacement forest is required as a result of activities under 3 (1) or (2), it must be of equivalent or better quality and quantity and be identified in order of priority, 1) immediately adjacent to the existing OGMA, or 2) in the same variant and landscape unit as the existing OGMA; such that OGMA ecological attributes and spatial distribution are maintained or improved. OGMA replacement areas must be documented, mapped and submitted to the satisfaction of the DDM at the end of each calendar year for his/her approval.

Note add 145, 54, 126 road construction.

4. Permissible Activities for Safety Purposes:

- (1) Maintenance, deactivation, removal of danger trees, or brushing and clearing on existing roads under active tenure within the right-of-way for safety purposes.
- (2) Felling of guyline clearance, tailhold anchor trees, or danger trees (except high value wildlife trees) along cutblock boundaries or within the right of way on new road/bridge alignments to meet safety requirements.

Objective 2

Maintain stand level structural diversity by retaining wildlife tree patches (WTP). Cutblocks for which harvesting has been completed by each licensee by tenure will retain adequate amounts of wildlife tree patches to ensure that over each 3 year period, commencing on the date the objectives are established, the target percentage as noted in Table A is achieved. In addition:

- (1) WTPs must be well distributed across the BEC subzone and located within or immediately adjacent to a cutblock.
- (2) Each cutblock >10 ha in size must have a minimum of 2% wildlife tree retention.
- (3) No timber harvesting, including single tree selection, is to occur within WTPs for at least one rotation, except as noted in (4) below.
- (4) Salvage of windthrown timber and harvesting of remaining standing stems is only permitted within WTPs where catastrophic windthrow exceeds 50% of the dominant or co-dominant stems; or where forest health issues pose a significant threat to areas outside the WTP. Where salvage/harvesting is planned and authorized, replacement WTP of equivalent or better quality and quantity must be identified immediately to achieve the retention target.
- (5) WTPs must include, if present, remnant old growth patches and live or dead veteran trees (excluding danger trees).
- (6) WTPs must include representative larger trees for the stand and any moderate to high value wildlife trees (excluding danger trees).
- (7) Where differences exist between mapped and actual BEC subzones, subzones will be confirmed by site plan information.

Table A. Wildlife Tree Retention by BEC subzone in the West Harrison Landscape Unit.

BEC Subzone	% Wildlife Tree Retention
CWH dm (Coastal Western Hemlock, dry maritime)	14
CWH vm (Coastal Western Hemlock, very wet maritime)	14
MH mm (Mountain Hemlock, moist maritime)	13

West Harrison Landscape Unit

11 January 2007



Map Study Area within the Chilliwack Forest District

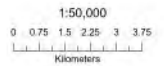


Legend

- OLD GROWTH MANAGEMENT AREA
- OLD SERAL REPRESENTATION AREA
- Landscape Unit Boundary
- Protected Area
- Biogeoclimatic Zone
- Road
- Water Course
- Contour Line (20m Interval)
- Waterbody

Submitted by: AM, MSRM
 (original signed by)
 Regional Director, Coast Region,
 Ministry of Sustainable Resource Management
 (7 June 2005)
 Date

Data Sources and Notes



Produced for:
Regional Client Services Division

Produced by:
BRITISH COLUMBIA
Integrated Land Management Bureau
Lower Mainland Service Center

Project: SP10048/00000000/00000000/WestHarrisonLandscapeUnit_11Jan112007.mxd
 Project/Datum: Albany NAD83
 Date Created: 2007-Jan-11
 Created by: Stacey Colucci/Center by HG



File: ORCS 17580-30/Yale

**ORDER TO ESTABLISH
A LANDSCAPE UNIT AND OBJECTIVES**

YALE LANDSCAPE UNIT

Pursuant to Section 4 of the *Forest Practices Code of British Columbia Act*, I hereby establish the Yale Landscape Unit, an area located north of Hope, BC in the Chilliwack Forest District, effective April 14, 2004.

The boundaries of the Yale Landscape Unit are shown on the Yale Landscape Unit map, dated March 10, 2004, attached to this Order.

In addition, I hereby establish objectives for the Yale Landscape Unit, as attached to this Order, effective April 14, 2004.

(Original signed by)

**Regional Director, Coast Region,
Ministry of Sustainable Resource Management**

Date

Preamble

The goal of these objectives is to sustain biological diversity at the landscape level; permissible activities are described to streamline administrative procedures and address operational safety concerns.

First Nations traditional use of forest resources, treaty negotiations or settlements will not be limited by the following objectives.

Legal Objectives - Yale Landscape Unit

Pursuant to Section 4 of the *Forest Practices Code of British Columbia Act*, the following are landscape unit objectives for the Yale Landscape Unit.

Objective 1

1. Maintain or recruit old growth forests in established old growth management areas (OGMAs), as shown on the attached Yale Landscape Unit map dated March 10, 2004 subject to timber harvesting and road construction in accordance with section 2, 3 and 4 below.
 2. (1) Where sufficient suitable replacement forest is available in the variants listed below, timber harvesting or road construction may be undertaken in OGMAs that are >10 ha in size for operational reasons up to a cumulative maximum of:
 - i) 30 ha in variant CWHds1,
 - ii) 80 ha in variant CWHms1, and
 - iii) 60 ha in variant MHmm2,provided that replacement OGMA of equivalent or better quality and quantity is identified in order of priority, 1) immediately adjacent to the existing OGMA, or 2) in the same variant and landscape unit as the existing OGMA.
 - (2) The criteria in 2 (1) is to apply to individual OGMAs within the categories below and must ensure that OGMA ecological attributes and spatial distribution are maintained or improved:
 - i) OGMAs >10 ha to <50 ha in size where the proposed activity affects the OGMA by <5 ha,
 - ii) OGMAs ≥50 ha to <100 ha in size where the proposed activity affects the OGMA by <10ha,
 - iii) OGMAs ≥100 ha in size where the proposed activity affects the OGMA by <10%.
 - iv) Construction of ≤500m of road or a bridge within an OGMA where there is no other practicable option. As an alternative to finding replacement area, the licensee may permanently deactivate and rehabilitate a temporary road or bridge site within four years after construction.
 - (3) Where OGMA boundary adjustments and replacement areas are required under section 2 (1) and (2) they must be documented, mapped and submitted to the satisfaction of the Delegated Decision Maker (DDM) at the end of each calendar year for his/her approval.
 - (4) The provisions in section 2 (1) and (2) do not apply to the following OGMAs #25, 26, 38.
3. Permissible Activities:
 - (1) Timber harvest may occur to prevent the spread of insect infestations or diseases that pose a significant threat to forested areas outside of OGMAs. Salvage within OGMAs will be done in a manner that retains as many old growth forest attributes as possible.

- (2) Construction of rock quarries and gravel pits under authority of forest tenure where the development will be located immediately adjacent to existing roads under tenure and will affect the OGMA by <0.5 ha.
 - (3) Intrusions, other than those specified, that affect an OGMA by less than 0.5 hectare in total.
 - (4) Where OGMA replacement forest is required as a result of activities under 3 (1) or (2), it must be of equivalent or better quality and quantity and be identified in order of priority, 1) immediately adjacent to the existing OGMA, or 2) in the same variant and landscape unit as the existing OGMA; such that OGMA ecological attributes and spatial distribution are maintained or improved. OGMA replacement areas must be documented, mapped and submitted to the satisfaction of the DDM at the end of each calendar year for his/her approval.
4. Permissible Activities for Safety Purposes:
- (1) Maintenance, deactivation, removal of danger trees, or brushing and clearing on existing roads under active tenure within the right-of-way for safety purposes.
 - (2) Felling of guyline clearance, tailhold anchor trees, or danger trees (except high value wildlife trees) along cutblock boundaries or within the right of way on new road/bridge alignments to meet safety requirements.

Objective 2

Maintain stand level structural diversity by retaining wildlife tree patches (WTP). Cutblocks for which harvesting has been completed by each licensee by tenure will retain adequate amounts of wildlife tree patches to ensure that over each 3 year period, commencing on the date the objectives are established, the target percentage as noted in Table A is achieved. In addition:

- (1) WTPs must be well distributed across the BEC subzone and located within or immediately adjacent to a cutblock.
- (2) Each cutblock >10 ha in size must have a minimum of 2% wildlife tree retention.
- (3) No timber harvesting, including single tree selection, is to occur within WTPs for at least one rotation, except as noted in (4) below.
- (4) Salvage of windthrown timber and harvesting of remaining standing stems is only permitted within WTPs where catastrophic windthrow exceeds 50% of the dominant or co-dominant stems; or where forest health issues pose a significant threat to areas outside the WTP. Where salvage/harvesting is planned and authorized, replacement WTP of equivalent or better quality and quantity must be identified immediately to achieve the retention target.
- (5) WTPs must include, if present, remnant old growth patches and live or dead veteran trees (excluding danger trees).
- (6) WTPs must include representative larger trees for the stand and any moderate to high value wildlife trees (excluding danger trees).
- (7) Where differences exist between mapped and actual BEC subzones, subzones will be confirmed by site plan information.

Table A. Wildlife Tree Retention by BEC subzone in the Yale Landscape Unit.

BEC Subzone	% Wildlife Tree Retention
CWH ds (Coastal Western Hemlock, dry subaritime)	5
CWH ms (Coastal Western Hemlock, moist subaritime)	8
MH mm (Mountain Hemlock, moist maritime)	5



File: ORCS 17580-30/Yale

**ORDER VARYING
A LANDSCAPE UNIT OBJECTIVE
YALE LANDSCAPE UNIT**

Pursuant to Section 4 (2) of the *Forest Practices Code of British Columbia Act*, I hereby vary the Yale Landscape Unit objective 1, effective February 3, 2005, as attached to this order. The Yale landscape unit is an area located north of Hope, B.C. in the Chilliwack Forest District.

The boundaries of the Yale Landscape Unit and the variance to old growth management areas (OGMAs) are shown on the Yale Landscape Unit map dated October 1, 2004 attached to this Order.

(Original signed by)

February 3, 2005

**Regional Director, Coast Region,
Ministry of Sustainable Resource Management**

Date

**Yale Landscape Unit – Legal Objectives
VARIANCE**

Pursuant to section 4(2) of the *Forest Practices Code of British Columbia Act*, Objective 1 of the Legal Objectives – Yale Landscape Unit is varied as follows:

Maintain or recruit old growth forests in established old growth management areas (OGMAS), as shown on the revised and attached Yale Landscape Unit map dated October 1, 2004 subject to timber harvesting and road construction in accordance with section 2, 3 and 4 of the original Legal objectives Order.



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Appendix 2

Species at Risk and Ungulate Species Notices



NOTICE – INDICATORS OF THE AMOUNT, DISTRIBUTION AND ATTRIBUTES OF WILDLIFE HABITAT REQUIRED FOR THE SURVIVAL OF SPECIES AT RISK IN THE CHILLIWACK FOREST DISTRICT

This Notice is given under the authority of section 7(2) of the *Forest Planning and Practices Regulation* (B.C. Reg. 14/04) and 9(3) of the *Woodlot Licence Planning and Practices Regulation* (B.C. Reg. 21/04).

The following Notice includes indicators of the amount, distribution and attributes of wildlife habitat required for the survival of the species at risk outlined in Schedule 1.

Approved Wildlife Habitat Areas are not included in the indicators of amount, distribution and attributes for each of the species outlined in Schedule 1. As per section 7(3) of the *Forest Planning and Practices Regulation*, forest tenure holders are exempt from the obligation to specify a result or strategy in relation to the objective set out in section 7(1) of the *Forest Planning and Practices Regulation*, for approved Wildlife Habitat Areas.

This Notice applies to the Chilliwack Forest District.

WLAP staff will provide assistance to all licensees in the Fraser TSA when these licensees develop results and strategies for FSP. WLAP will help to spatially locate areas with suitable wildlife habitat for species at risk to ensure that results or strategies are biologically appropriate and wherever possible, overlap with existing and proposed Old Growth Management Areas, riparian reserves and other areas that have been removed from timber harvesting, and areas subject to other operational constraints (example: terrain challenges, SPOW areas, scenic areas with VQO).

Schedule 1

1) Coastal Giant Salamander (*Dicamptodon tenebrosus*)

Amount:

1. 850 ha not exceeding an impact to the mature timber harvesting landbase of 550 ha.

Distribution:

1. The amount of habitat referenced above must be distributed to provide:
 - areas of suitable habitat of the size, spatial distribution and connectivity identified in the species account for Coastal Giant Salamander in the *Accounts and Measures for Managing Identified Wildlife* (Identified Wildlife Management Strategy Version 2004).

- The areas described above are located within the biogeoclimatic units and preferred elevations identified in the species account for Coastal Giant Salamander in the *Accounts and Measures for Managing Identified Wildlife* in the Identified Wildlife Management Strategy Version 2004.

Attributes:

**Species: Coastal
Giant
Salamander**

Attribute	Characteristics
Size	Generally between 20 - 100 ha in size. Areas managed for this species should include a 30 m core area and a 20 m buffer area. This should be maintained on both sides of all occupied stream reaches to encompass known observations and suitable aquatic habitat.
Aquatic habitat Characteristics	Aquatic habitats are characterised by clear, cool, fast-flowing and well-oxygenated streams with step-pool morphology and sufficient hiding cover (i.e., rocks, debris, and overhanging stream banks). Additionally streams by be further characterised by year round flow, non-fish bearing (S4-S6), small size (<5m width), intermediate gradient, stable channel beds and forest canopy cover.
Terrestrial habitat Characteristics	Moist forested areas with ample hiding cover in close proximity (10m) to streams. Most common refuge locations (for adults) are within or under CWD (in advanced stages of decay (Decay Class 3-5), underground and under rocks. Generally within mature or old forest close to headwaters and free of fish.
Stream Classification	Generally found in non-fish bearing streams (S4-S6). Tadpole abundance decreases with increasing width and increasing depth.
Elevation	Found from sea level to 2160 m.

2) Grizzly Bear (*Ursus arctos*)

Amount:

- An amount not exceeding an impact to the mature timber harvesting landbase of 445 ha.

Distribution:

- The amount of habitat referenced above must be distributed to provide:
 - areas of suitable foraging and security habitat of the size and spatial distribution identified in the species account for Grizzly Bear in the *Accounts and Measures for Managing Identified Wildlife* (Identified Wildlife Management Strategy Version 2004).
- The areas described above are located within the biogeoclimatic units and preferred elevations identified in the species account for Grizzly Bear in the *Accounts and Measures for Managing Identified Wildlife* (Identified Wildlife Management Strategy Version 2004).

Attributes:

1) Cascades Grizzly Bear Population Unit

A. Important Grizzly Bear Habitat Types and their Season of Use in the North Cascades Grizzly Bear Population Unit.

Habitat Types	Season of Use		
	Spring *	Summer	Fall **
Riparian areas, including wetlands (see Table below)	X	X	X
Avalanche tracks and run out zones	X	X	X
<i>Hedysarum</i> and glacier lily complexes	X	X	
Sub-alpine parkland meadows		X	X
Berry producing sites (see Table below)		X	X

***Spring** refers to the period after bears emerge from their dens - late March through April until spring habitats are no longer used – usually the end of June.

****Fall** refers to the period when berries become abundant - often late July/early August through to November.

B. Attributes of Riparian Habitats in the North Cascades Grizzly Bear Population Unit.

Biogeoclimatic Subzone Variants	Site Series
CWHdm	07, 12, 14, 15
CWHds1	07, 12
CWHms1	06, 11
CWHvm2	07, 08, 11
CWHxm1	07, 12, 14, 15
ESSFdc2	08
ESSFmw	08
ESSFxc	08
IDFdk1	06
IDFdk2	06, 07
IDFww	06, 07
IDFxb2	08
MHmm2	06, 07, 09
MSdm2	07
MSxk	09
PPxb2	07

C. Attributes of High and Moderate Berry (principally *Vaccinium*) Producing Site Series in the North Cascades Grizzly Bear Population Unit.

Biogeoclimatic Subzone Variants	High Berry Productivity Site Series	Moderate Berry Productivity Site Series
CWHdm	12	
CWHms1	02, 01, 05, 06, 11	03
CWHvm2	03, 01, 05, 06, 07, 09, 10, 11	02, 04
ESSFdc2		05
ESSFmw	04, 05	01, 02, 06, 07, 08
MHmm2	02, 01, 04, 05, 06, 07, 08	03, 09

2) Stein-Nahatlatch Grizzly Bear Population Unit

**Species:
Grizzly Bear**

Attribute	Characteristics
Size	1-500 ha, depending on the area of use, extent of seasonal habitat and buffer size required.
Critical patch habitats	Critical patch habitats include, estuaries, rich non-forested fens, the edges of forested and non-forested bogs, herb-dominated patches on avalanche chutes with adjacent forest (particularly south-facing ones), herb-dominated subalpine parkland meadows, skunk cabbage swamps, floodplain ecosystems, white bark pine forage areas, and areas where bears fish for spawning salmon. Den cavities and surrounding stands are also considered critical. Non-forested critical habitats include a core area and buffer of forested cover. Forested critical habitats are not buffered.
Denning Habitat Features	Hibernating habitats tend to be high elevation areas that are sloped with dry, stable soil conditions that remain frozen throughout the winter. Dens are typically located on steep north-facing slopes, areas where vegetation will stabilize the den roof and where snow will accumulate for insulation. Dens are rarely re-used but Grizzly bears will often return to the same vicinity to dig new dens.
Foraging Habitat Features	Habitat selection is strongly influenced by meeting nutritional requirements, access to mates, thermal cover (i.e., dens), social interactions and the presence and activities of people. Habitat requirements vary greatly as some bears are more transient while others are more resident. Both residents and transients select patches or complexes of habitats within landscapes.
Structural Stage	Generally, foraging is more abundant in non-forested sites, sites with partial forest or sites with many tree gaps in older forest. Closed forest sites near quality habitat may be used for security and day bedding areas. Many or all structural stages can be used seasonally or for specific needs and as such, forage type is not necessarily tied to one particular structural stage.
Elevation	All elevations from sea level estuaries to high alpine meadows and talus slopes.

3) Pacific Water Shrew (*Sorex bendirii*)

Amount:

1. 50 ha not exceeding an impact to the mature timber harvesting landbase of 25 ha.

Distribution:

1. The amount of habitat referenced above must be distributed to provide:
 - areas of suitable habitat of the size and spatial distribution identified in the species account for Pacific Water Shrew in the *Accounts and Measures for Managing Identified Wildlife* (Identified Wildlife Management Strategy Version 2004).
2. The areas described above are located within the biogeoclimatic units and preferred elevations identified in the species account for Pacific Water Shrew in the *Accounts and Measures for Managing Identified Wildlife* in the Identified Wildlife Management Strategy Version 2004.

Attributes:

**Species:
Pacific Water
Shrew**

Attribute	Characteristics
Size	Generally between 5 and 45 ha in size depending on area of suitable habitat. Area should extend entire length of the stream or wetland and include a 30 m core with a 45 m management zone on each side of the stream or around wetland complex.
Habitat Features	Moist, coastal forests that border streams and skunk-cabbage marshes with an abundance of shrubs and coarse woody debris and extensive canopy closure. Maintain 70% basal area within the management zone. Partial harvesting within the management zone will promote microhabitat and structural elements such as multi-layered canopies, wildlife trees and coarse woody debris. The area should include suitable riparian and terrestrial habitat; wetlands, streams or other suitable habitat should reside within 1 km whenever possible.
Structural Stage Elevation	4 (pole/sapling), 5 (young forest), 6 (mature forest), 7(old forest). Up to 850 m (generally below 850m).

4) Tall Bugbane (*Actaea elata*)

Amount:

1. 200 ha not exceeding an impact to the mature timber harvesting landbase of 75 ha.

Distribution:

1. The amount of habitat referenced above must be distributed to provide:
 - areas of suitable habitat of the size, spatial distribution and connectivity identified in the species account for Tall Bugbane in the *Accounts and Measures for Managing Identified Wildlife* (Identified Wildlife Management Strategy Version 2004).
2. The areas described above are located within the biogeoclimatic units and preferred elevations identified in the species account for Tall Bugbane in the *Accounts and Measures for Managing Identified Wildlife* in the Identified Wildlife Management Strategy Version 2004.

Attributes:

**Species:
Tall Bugbane**

Attribute	Characteristics
Size	Typically between 20 and 40 ha but depends on site-specific conditions (i.e., size of population and area covered by population). The area should include a core area (defined by the perimeter of the population plus a 30-50m band around the population) plus a management zone (typically 150-200 m - should be large enough to preserve the ambient conditions and be windfirm).

Tree Species	Tree species that occur with tall bugbane include big-leaf maple, Douglas maple and vine maple.
Habitat Features	Shady, moist, mature (70-150 yrs) western red cedar forest commonly in Thuja Plicata - Polystichum munitum - Achlys triphylla communities. It is almost always associated with big-leaf maple. The deciduous component of mixed forest is important in maintaining optimal light conditions. Known to occur on 15-35 degree slopes with north, southwest and south aspects.
Structural Stage	1-3: non-vegetated to small shrub (<15yrs), 4-6: pole/sapling to mature forest (70-150yrs).
Elevation	300 - 1300 m.

5) Coastal Tailed Frog (*Ascaphus truei*)

Amount:

1. 60 ha not exceeding an impact to the mature timber harvesting landbase of 30 ha.

Distribution:

1. The amount of habitat referenced above must be distributed to provide:
 - areas of suitable habitat of the size and spatial distribution identified in the species account for Coastal Tailed Frog in the *Accounts and Measures for Managing Identified Wildlife* (Identified Wildlife Management Strategy Version 2004).
2. The areas described above are located within occupied streams in the biogeoclimatic units and preferred elevations identified in the species account for Coastal Tailed Frog in the *Accounts and Measures for Managing Identified Wildlife* in the Identified Wildlife Management Strategy Version 2004.

Attributes:

Species: Coastal Tailed Frog

Attribute	Characteristics
Size	Approximately 20 ha (depending on number and length of suitable stream reaches). Larger areas may be appropriate in watersheds with unstable terrain (class 4-5). Areas should include at least two streams or stream reaches (i.e., S4 to S6) with previous detections of tailed frogs. The area should include a 30 m core area buffered by a 20m management zone on both sides of occupied stream reaches.
Habitat Attributes	Tailed frog aquatic habitats are generally characterised by year round flow, non fish bearing (S4-S6), intermediate gradient (>2.5%), coarse substrates (>6.4 cm), stable channel beds and forest cover (generally associated with structural stage S6 or S7). Retain 100% of forest cover within the core area. Within the management zone maintain 70% basal area with appropriate structure to maintain riparian forest, important structural elements (e.g., coarse wood debris,) water quality and temperature (5 to 18 degrees), and naturally dispersed water flows.
Elevation	From sea level to 2140 m.

6) Spotted Owl (*Strix occidentalis*)

Amount:

An amount of area consistent with the area contained within Special Resource Management Zone and Matrix Activity Centre boundaries in the Chilliwack Forest District as identified in the 1997 *Spotted Owl Management Plan*.

Distribution:

The amount referenced above must be distributed consistent with Special Resource Management Zones and Matrix Activity Centres boundaries in the Chilliwack Forest District as identified in the 1997 *Spotted Owl Management Plan*.

Attributes:

Attributes consistent with those identified for Long Term Activity Centres (LTACs) in the 1999 *Spotted Owl Management Plan – Resource Management Plans* and attributes consistent with those identified for Matrix Activity Centres in the 1997 *Spotted Owl Management Plan* for the Chilliwack Forest District.



August 3, 2007

NOTICE – INDICATORS OF THE AMOUNT, DISTRIBUTION AND ATTRIBUTES OF WILDLIFE HABITAT REQUIRED FOR THE SURVIVAL OF SPECIES AT RISK IN THE CHILLIWACK FOREST DISTRICT

This Notice is given under the authority of section 7(2) of the *Forest Planning and Practices Regulation* (B.C. Reg. 14/04) and 9(3) of the *Woodlot Licence Planning and Practices Regulation* (B.C. Reg. 21/04).

The following Notice includes indicators of the amount, distribution and attributes of wildlife habitat required for the survival of the species at risk outlined in Schedule 1.

Approved Wildlife Habitat Areas are not included in the indicators of amount, distribution and attributes for each of the species outlined in Schedule 1. As per section 7(3) of the *Forest Planning and Practices Regulation*, forest tenure holders are exempt from the obligation to specify a result or strategy in relation to the objective set out in section 7(1) of the *Forest Planning and Practices Regulation*, for approved Wildlife Habitat Areas.

This Notice applies to the Chilliwack Forest District.

MOE staff will provide assistance to all licensees in the Fraser TSA when these licensees develop results and strategies for FSP. MOE will help to spatially locate areas with suitable wildlife habitat for species at risk to ensure that results or strategies are biologically appropriate and wherever possible, overlap with existing and proposed Old Growth Management Areas, riparian reserves and other areas that have been removed from timber harvesting, and areas subject to other operational constraints (example: terrain challenges, SPOW areas, scenic areas with VQO).

This Notice replaces the Notice issued for the Chilliwack Forest District on December 30, 2004.

Schedule 1

1) Coastal Giant Salamander (*Dicamptodon tenebrosus*)

Amount:

1. 850 ha not exceeding an impact to the mature timber harvesting landbase of 550 ha.

Distribution:

1. The amount of habitat referenced above must be distributed to provide:

- areas of suitable habitat of the size, spatial distribution and connectivity identified in the species account for Coastal Giant Salamander in the *Accounts and Measures for Managing Identified Wildlife* (Identified Wildlife Management Strategy Version 2004).
2. The areas described above are located within the biogeoclimatic units and preferred elevations identified in the species account for Coastal Giant Salamander in the *Accounts and Measures for Managing Identified Wildlife* in the Identified Wildlife Management Strategy Version 2004.

Attributes:

**Species:
Coastal Giant Salamander**

Attribute	Characteristics
Size	Generally between 20 - 100 ha in size. Areas managed for this species should include a 30 m core area and a 20 m buffer area. This should be maintained on both sides of all occupied stream reaches to encompass known observations and suitable aquatic habitat.
Aquatic habitat Characteristics	Aquatic habitats are characterised by clear, cool, fast-flowing and well-oxygenated streams with step-pool morphology and sufficient hiding cover (i.e., rocks, debris, and overhanging stream banks). Additionally streams may be further characterised by year round flow, non-fish bearing (S4-S6), small size (<5m width), intermediate gradient, stable channel beds and forest canopy cover.
Terrestrial habitat Characteristics	Moist forested areas with ample hiding cover in close proximity (10m) to streams. Most common refuge locations (for adults) are within or under CWD (in advanced stages of decay (Decay Class 3-5), underground and under rocks. Generally within mature or old forest close to headwaters and free of fish.
Stream Classification	Generally found in non-fish bearing streams (S4-S6). Tadpole abundance decreases with increasing width and increasing depth.
Elevation	Found from sea level to 2160 m.

2) Grizzly Bear (*Ursus arctos*)

Amount:

1. An amount not exceeding an impact to the mature timber harvesting landbase of 387 ha.

Distribution:

1. The amount of habitat referenced above must be distributed to provide:
 - areas of suitable foraging and security habitat of the size and spatial distribution identified in the species account for Grizzly Bear in the *Accounts and Measures for Managing Identified Wildlife* (Identified Wildlife Management Strategy Version 2004).
2. The areas described above are located within the biogeoclimatic units and preferred elevations identified in the species account for Grizzly Bear in the *Accounts and Measures for Managing Identified Wildlife* (Identified Wildlife Management Strategy Version 2004).

Attributes:

1) Cascades Grizzly Bear Population Unit

A. Important Grizzly Bear Habitat Types and their Season of Use in the North Cascades Grizzly Bear Population Unit.

Habitat Types	Season of Use		
	Spring *	Summer	Fall **
Riparian areas, including wetlands (see Table below)	X	X	X
Avalanche tracks and run out zones	X	X	X
<i>Hedysarum</i> and glacier lily complexes	X	X	
Sub-alpine parkland meadows		X	X
Berry producing sites (see Table below)		X	X

**Spring* refers to the period after bears emerge from their dens - late March through April until spring habitats are no longer used – usually the end of June.

***Fall* refers to the period when berries become abundant - often late July/early August through to November.

B. Attributes of Riparian Habitats in the North Cascades Grizzly Bear Population Unit.

Biogeoclimatic Subzone Variants	Site Series
CWHdm	07, 12, 14, 15
CWHdsl	07, 12
CWHmsl	06, 11
CWHvm2	07, 08, 11
CWHxml	07, 12, 14, 15
ESSFdc2	08
ESSFmw	08
ESSFxc	08
IDFdk1	06
IDFdk2	06, 07
IDFww	06, 07
IDFvh2	08
MHmm2	06, 07, 09
MSdm2	07
MSxk	09
PPxh2	07

C. Attributes of High and Moderate Berry (principally *Vaccinium*) Producing Site Series in the North Cascades Grizzly Bear Population Unit.

Biogeoclimatic Subzone Variants	High Berry Productivity Site Series	Moderate Berry Productivity Site Series
CWHdm	12	
CWHmsl	02, 01, 05, 06, 11	03
CWHvm2	03, 01, 05, 06, 07, 09, 10, 11	02, 04
ESSFdc2		05
ESSFmw	04, 05	01, 02, 06, 07, 08
MHmm2	02, 01, 04, 05, 06, 07, 08	03, 09

2) Stein-Nahatlatch Grizzly Bear Population Unit

**Species:
Grizzly Bear**

Attribute	Characteristics
Size	1-500 ha, depending on the area of use, extent of seasonal habitat and buffer size required.
Critical patch habitats	Critical patch habitats include, estuaries, rich non-forested fens, the edges of forested and non-forested bogs, herb-dominated patches on avalanche chutes with adjacent forest (particularly south-facing ones), herb-dominated subalpine parkland meadows, skunk cabbage swamps, floodplain ecosystems, white bark pine forage areas, and areas where bears fish for spawning salmon. Den cavities and surrounding stands are also considered critical. Non-forested critical habitats include a core area and buffer of forested cover. Forested critical habitats are not buffered.
Denning Habitat Features	Hibernating habitats tend to be high elevation areas that are sloped with dry, stable soil conditions that remain frozen throughout the winter. Dens are typically located on steep north-facing slopes, areas where vegetation will stabilize the den roof and where snow will accumulate for insulation. Dens are rarely re-used but Grizzly bears will often return to the same vicinity to dig new dens.
Foraging Habitat Features	Habitat selection is strongly influenced by meeting nutritional requirements, access to mates, thermal cover (i.e., dens), social interactions and the presence and activities of people. Habitat requirements vary greatly as some bears are more transient while others are more resident. Both residents and transients select patches or complexes of habitats within landscapes.
Structural Stage	Generally, foraging is more abundant in non-forested sites, sites with partial forest or sites with many tree gaps in older forest. Closed forest sites near quality habitat may be used for security and day bedding areas. Many or all structural stages can be used seasonally or for specific needs and as such, forage type is not necessarily tied to one particular structural stage.
Elevation	All elevations from sea level estuaries to high alpine meadows and talus slopes.

3) Pacific Water Shrew (*Sorex bendirii*)

Amount:

1. 50 ha not exceeding an impact to the mature timber harvesting landbase of 25 ha.

Distribution:

1. The amount of habitat referenced above must be distributed to provide:
 - areas of suitable habitat of the size and spatial distribution identified in the species account for Pacific Water Shrew in the *Accounts and Measures for Managing Identified Wildlife* (Identified Wildlife Management Strategy Version 2004).
2. The areas described above are located within the biogeoclimatic units and preferred elevations identified in the species account for Pacific Water Shrew in the *Accounts and Measures for Managing Identified Wildlife* in the Identified Wildlife Management Strategy Version 2004.

Attributes:

**Species:
Pacific Water Shrew**

Attribute	Characteristics
Size	Generally between 5 and 45 ha in size depending on area of suitable habitat. Area should extend entire length of the stream or wetland and include a 30 m core with a 45 m management zone on each side of the stream or around wetland complex.
Habitat Features	Moist, coastal forests that border streams and skunk-cabbage marshes with an abundance of shrubs and coarse woody debris and extensive canopy closure. Maintain 70% basal area within the management zone. Partial harvesting within the management zone will promote microhabitat and structural elements such as multi-layered canopies, wildlife trees and coarse woody debris. The area should include suitable riparian and terrestrial habitat; wetlands, streams or other suitable habitat should reside within 1 km whenever possible.
Structural Stage	4 (pole/sapling), 5 (young forest), 6 (mature forest), 7(old forest).
Elevation	Up to 850 m (generally below 850m).

4) Tall Bugbane (*Actaea elata*)

Amount:

1. 200 ha not exceeding an impact to the mature timber harvesting landbase of 75 ha.

Distribution:

1. The amount of habitat referenced above must be distributed to provide:
 - areas of suitable habitat of the size, spatial distribution and connectivity identified in the species account for Tall Bugbane in the *Accounts and Measures for Managing Identified Wildlife* (Identified Wildlife Management Strategy Version 2004).
2. The areas described above are located within the biogeoclimatic units and preferred elevations identified in the species account for Tall Bugbane in the *Accounts and Measures for Managing Identified Wildlife* in the Identified Wildlife Management Strategy Version 2004.

Attributes:

**Species:
Tall Bugbane**

Attribute	Characteristics
Size	Typically between 20 and 40 ha but depends on site-specific conditions (i.e., size of population and area covered by population). The area should include a core area (defined by the perimeter of the population plus a 30-50m band around the population) plus a management zone (typically 150-200 m - should be large enough to preserve the ambient conditions and be windfirm).

Tree Species	Tree species that occur with tall bugbane include big-leaf maple, Douglas maple and vine maple.
Habitat Features	Shady, moist, mature (70-150 yrs) western red cedar forest commonly in Thuja Plicata - Polystichum munitum - Achlys triphylla communities. It is almost always associated with big-leaf maple. The deciduous component of mixed forest is important in maintaining optimal light conditions. Known to occur on 15-35 degree slopes with north, southwest and south aspects.
Structural Stage	1-3: non-vegetated to small shrub (<15yrs), 4-6: pole/sapling to mature forest (70-150yrs).
Elevation	300 - 1300 m.

5) Coastal Tailed Frog (*Ascaphus truei*)

Amount:

1. 60 ha not exceeding an impact to the mature timber harvesting landbase of 30 ha.

Distribution:

1. The amount of habitat referenced above must be distributed to provide:
 - areas of suitable habitat of the size and spatial distribution identified in the species account for Coastal Tailed Frog in the *Accounts and Measures for Managing Identified Wildlife* (Identified Wildlife Management Strategy Version 2004).
2. The areas described above are located within occupied streams in the biogeoclimatic units and preferred elevations identified in the species account for Coastal Tailed Frog in the *Accounts and Measures for Managing Identified Wildlife* in the Identified Wildlife Management Strategy Version 2004.

Attributes:

Species: Coastal Tailed Frog

Attribute	Characteristics
Size	Approximately 20 ha (depending on number and length of suitable stream reaches). Larger areas may be appropriate in watersheds with unstable terrain (class 4-5). Areas should include at least two streams or stream reaches (i.e., S4 to S6) with previous detections of tailed frogs. The area should include a 30 m core area buffered by a 20m management zone on both sides of occupied stream reaches.
Habitat Attributes	Tailed frog aquatic habitats are generally characterised by year round flow, non fish bearing (S4-S6), intermediate gradient (>2.5%), coarse substrates (>6.4 cm), stable channel beds and forest cover (generally associated with structural stage S6 or S7). Retain 100% of forest cover within the core area. Within the management zone maintain 70% basal area with appropriate structure to maintain riparian forest, important structural elements (e.g., coarse wood debris,) water quality and temperature (5 to 18 degrees), and naturally dispersed water flows.
Elevation	From sea level to 2140 m.

6) Spotted Owl (*Strix occidentalis*)

Amount:

An amount of area consistent with the area contained within Special Resource Management Zone and Matrix Activity Centre boundaries in the Chilliwack Forest District as identified in the 1997 *Spotted Owl Management Plan*, with the exception of the area noted below:

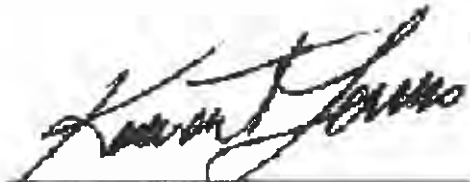
- As of September 30, 2007 this Notice will not apply to the portion of LTAC 12B, within SRMZ 12, found west of Big Silver River, as shown in the map *Big Silver Cattermole Tincup LTAC Replacement Area – Contributing Forest Land Base* (June 8, 2007). The Notice will continue to apply to the portion of LTAC 12B east of Big Silver River
- The area removed from LTAC 12B is to be exchanged for the protection of Spotted Owls and their habitat in the Tincup Creek area of upper Nahatlatch River. The amount distribution and attributes (to be defined by September 30, 2007) will be consistent with the provisions of the 1997 SOMP and will be established to result in a no-net loss of THLB and Spotted Owl habitat.

Distribution:

The amount referenced above must be distributed consistent with Special Resource Management Zones and Matrix Activity Centres boundaries in the Chilliwack Forest District as identified in the 1997 *Spotted Owl Management Plan*, with the above noted exception and addition.

Attributes:

Attributes consistent with those identified for Long Term Activity Centres (LTACs) in the 1999 *Spotted Owl Management Plan – Resource Management Plans* and attributes consistent with those identified for Matrix Activity Centres in the 1997 *Spotted Owl Management Plan* for the Chilliwack Forest District, with the above noted exemption and addition.



Signed this 3rd day of August, 2007
Kaaren Lewis, Director Ecosystems Branch
Ministry of Environment

August 18, 2009

**NOTICE- INDICATORS OF THE AMOUNT, DISTRIBUTION AND
ATTRIBUTES OF WILDLIFE HABITAT REQUIRED FOR THE
SURVIVAL OF SPOTTED OWL IN THE CHILLIWACK FOREST
DISTRICT**

This notice is given consistent with the provisions of section 7(2) of the *Forest Planning and Practices Regulation* (BC Reg. 14/04) and 9(3) of the *Woodlot Licence Planning and Practices Regulation* (BC Reg. 21/04)

The following Notice includes indicators of the amount, distribution and attributes of wildlife habitat required for the survival of Spotted Owl as outlined in Schedule 1.

Approved Wildlife Habitat Areas for Spotted Owl are not included in the indicators of amount, distribution and attributes for Spotted Owls. As per section 7(3) of the *Forest Planning and Practices Regulation*, forest tenure holders are exempt from the obligation to specify a result or strategy in relation to the objectives set out in section 7(1) of the *Forest Planning and Practices Regulation*, for approved Wildlife Habitat Areas.

This Notice applies to the Chilliwack Forest District.

This Notice replaces the amount, distribution and attributes provided for Spotted Owl in the Notice for the Chilliwack Forest District dated August 3, 2007. The August 3, 2007 Notice remains in effect for the other species at risk.

Schedule 1

1) Spotted Owl (*Strix occidentalis*)

Amount:

An amount of area consistent with the area spatially defined as Long Term Owl Habitat (LTOH) Areas and Managed Forest Habitat Areas (MFHA) in the Chilliwack Forest District as identified on the *Chilliwack Forest District Spotted Owl Management Plan Map and the Spotted Owl LTOH and MFHA Area Summary Table* – dated May 22, 2009.

Distribution:

The amount referenced above must be distributed consistent with Long Term Owl Habitat Areas and Managed Forest Habitat Areas as identified in the *Chilliwack Forest District Spotted Owl Management Plan Map* –dated May 22, 2009.

Attributes:

Attributes consistent with those contained in the *Best Management Practices for Managing Spotted Owl Habitat: A component of the Spotted Owl Management Plan 2, Chilliwack and Squamish Forest Districts* dated July 7, 2009, with the exception of:

1. blocks: Sowaqua Block 1, Depot Creek 101 and Cantelon Creek 8710, where the attributes will be consistent with the *1997 Spotted Owl Management Plan* and the *1999 Spotted Owl Management Plan—Resource Management Plans*.
2. blocks: Ford Mountain 2003, 2004, 2005, 2006, where the attributes will be consistent with either:
 - a. the *1997 Spotted Owl Management Plan* and the *1999 Spotted Owl Management Plan—Resource Management Plans*; or
 - b. *Best Management Practices for Managing Spotted Owl Habitat: A component of the Spotted Owl Management Plan 2, Chilliwack and Squamish Forest Districts* dated July 7, 2009



Signed this 18th day of August, 2009

for Kaaren Lewis, Director Ecosystems Branch
Ministry of Environment

October 2010

**NOTICE – INDICATORS OF THE AMOUNT, DISTRIBUTION AND ATTRIBUTES OF
WILDLIFE HABITAT REQUIRED FOR THE SURVIVAL OF GRIZZLY BEAR IN
THE CHILLIWACK FOREST DISTRICT**
Amendment

This Notice is given under the authority of section 7(2) of the *Forest Planning and Practices Regulation* (B.C. Reg. 14/04) and 9(3) of the *Woodlot Licence Planning and Practices Regulation* (B.C. Reg. 21/04).

The following Notice includes indicators of the amount, distribution and attributes of wildlife habitat required for the survival of the species at risk outlined in Schedule 1.

Approved Wildlife Habitat Areas for Grizzly Bear are not included in the indicators of amount, distribution and attributes for Grizzly Bear. As per section 7(3) of the *Forest Planning and Practices Regulation*, forest tenure holders are exempt from the obligation to specify a result or strategy in relation to the objectives set out in section 7(1) of the *Forest Planning and Practices Regulation*, for approved Wildlife Habitat Areas

This Notice applies to the Chilliwack Forest District.

This Notice replaces the amount, distribution and attributes provided for Grizzly Bear in the Notice for the Chilliwack Forest District dated August 3, 2007. The August 3, 2007 Notice remains in effect for the other species at risk.

Schedule 1

1) Grizzly Bear (*Ursus arctos*)

Amount:

1. 4928 ha not exceeding an impact to the mature timber harvesting landbase of 234 ha.

Distribution:

1. The amount of habitat referenced above must be distributed to provide:
 - areas of suitable foraging and security habitat of the size and spatial distribution identified in the species account for Grizzly Bear in the *Accounts and Measures for Managing Identified Wildlife* (Identified Wildlife Management Strategy Version 2004).
2. The areas described above are located within the biogeoclimatic units and preferred elevations identified in the species account for Grizzly Bear in the *Accounts and Measures for Managing Identified Wildlife* (Identified Wildlife Management Strategy Version 2004).

Attributes:

Stein-Nahatlatch Grizzly Bear Population Unit

Species:
Grizzly Bear

Attribute	Characteristics
Size	1-500 ha, depending on the area of use, extent of seasonal habitat and buffer size required.
Critical patch habitats	Critical patch habitats include, estuaries, rich non-forested fens, the edges of forested and non-forested bogs, herb-dominated patches on avalanche chutes with adjacent forest (particularly south-facing ones), herb-dominated subalpine parkland meadows, skunk cabbage swamps, floodplain ecosystems, white bark pine forage areas, and areas where bears fish for spawning salmon. Den cavities and surrounding stands are also considered critical. Non-forested critical habitats include a core area and buffer of forested cover. Forested critical habitats are not buffered.
Denning Habitat Features	Hibernating habitats tend to be high elevation areas that are sloped with dry, stable soil conditions that remain frozen throughout the winter. Dens are typically located on steep north-facing slopes, areas where vegetation will stabilize the den roof and where snow will accumulate for insulation. Dens are rarely re-used but Grizzly bears will often return to the same vicinity to dig new dens.
Foraging Habitat Features	Habitat selection is strongly influenced by meeting nutritional requirements, access to mates, thermal cover (i.e., dens), social interactions and the presence and activities of people. Habitat requirements vary greatly as some bears are more transient while others are more resident. Both residents and transients select patches or complexes of habitats within landscapes.
Structural Stage	Generally, foraging is more abundant in non-forested sites, sites with partial forest or sites with many tree gaps in older forest. Closed forest sites near quality habitat may be used for security and day bedding areas. Many or all structural stages can be used seasonally or for specific needs and as such, forage type is not necessarily tied to one particular structural stage.
Elevation	All elevations from sea level estuaries to high alpine meadows and talus slopes.



Signed this 4th day of October, 2010

Kaaren Lewis, Director Ecosystems Protection and Sustainability Branch
Ministry of Environment



NOTICE – INDICATORS OF THE AMOUNT, DISTRIBUTION AND ATTRIBUTES OF WILDLIFE HABITAT REQUIRED FOR THE WINTER SURVIVAL OF UNGULATE SPECIES IN THE FRASER TIMBER SUPPLY AREA

This notice is given under the authority of section 7(2) of the *Forest Planning and Practices Regulation* (B.C. Reg. 14/04) and 9 (3) of the *Woodlot License Planning and Practices Regulation* (B.C. Reg. 21/04).

The following notice includes indicators of the amount, distribution and attributes of wildlife habitat required for the winter survival of the ungulate species outlined in Schedule 1.

This notice applies as specified within the Fraser Timber Supply Area.

WLAP staff will provide assistance to all licensees in the Fraser TSA when these licensees develop results and strategies for FSP. WLAP will help to spatially locate habitat suitable for the winter survival of ungulate species to ensure that results or strategies are biologically appropriate and wherever possible, overlap with existing and proposed Old Growth Management Areas, riparian reserves and other areas that have been removed from timber harvesting, and areas subject to other operational constraints (example: terrain challenges, SPOW areas, scenic areas with VQO).

Schedule 1

Fraser Timber Supply Area

I) Ungulate Species:

Mountain Goat (*Oreamnos americanus*)

Amount:

1500 ha of timber harvesting landbase.

Distribution:

The amount of habitat referenced above must be distributed to provide:

1. Individual winter range areas for Mountain Goats in the Fraser TSA which exhibit Coastal, Interior and/or Transitional behavioural ecotypes. Individual winter range areas must be > 50 ha in size.
2. Areas exhibiting current use by mountain goats during critical winter conditions (generally December through February).

Attributes:

1. Escape terrain: aspects ranging from east, through south, to west consisting of rock outcrops, cliffs or bluff complexes; slopes $>26.5^\circ$ (50%) and $<51.3^\circ$ (125%); and elevations ranging from 200m to 2500m.
2. Accessible and abundant forage in close proximity to escape terrain: areas of low snow-loading that allow goats to access available forage: forest canopies with high snow interception characteristics, and/or warm, southerly aspects with high melt and snow-shedding characteristics; areas that provide high quality forage (i.e., rooted forage and arboreal litterfall, including lichens).
3. Critical stand structure features: mature and old growth (ideally old growth [>250 years] but can include stands >100 years of age) stands, typically Douglas-fir (*Pseudotsuga menziesii*) dominated, with large, well-developed crowns. Stands can be distributed as: larger forested patches surrounding escape terrain; smaller scattered patches within and adjacent escape terrain; and as small groups of trees located on bluff complexes and along cliffs within the escape terrain.
4. Snow interception and thermal cover: Douglas-fir (*Pseudotsuga menziesii*) dominated coniferous stands at least 12 m in height with large, well-developed crowns and a canopy closure exceeding 70%.

II) Ungulate Species:

Black-tailed & Mule Deer (*Odocoileus hemionus sp.*)

Amount:

3500 ha of timber harvesting landbase.

Distribution:

The amount of habitat referenced above must be distributed to provide:

1. Individual winter range areas for Black-tailed & Mule Deer with a minimum size of 50 ha, distributed across the Timber Supply Area. In drainages where, due to past forest harvest, no stands larger than 50 ha which contain the attributes listed below currently exist, selection of winter range areas greater than 20ha can be considered as adequate; and
2. Areas exhibiting use by deer during critical winter conditions (generally December through February).

Attributes:

1. Critical stand structure features (including snow interception and thermal cover): mature and old growth (ideally old growth [>250 years] but can include stands >100 years of age) Douglas-fir (*Pseudotsuga menziesii*) dominated stands with large, well-developed crowns that provide canopy closures ranging from 65-90%, and preferably greater than 12 m in height.
2. Topographic features: south east, through south, to west aspects; moderate to steep slopes (40-100%); lower to moderate elevations (>200 m and $< 1,000$ m); minimal shading from adjacent mountains; and presence of open rock bluffs with southerly

aspects. Locate winter ranges in the moderate and deep snow zones. Thermal cover requirements in the low and the very deep snow zones.

3. Important winter forage species include: Douglas-fir (*Pseudotsuga menziesii*) (primarily from litterfall); Salal (*Gaultheria shallon*); saskatoon (*Amelanchier alnifolia*); Douglas maple (*Acer glabrum*); willow (*Salix* spp.); falsebox (*Pachistima myrsinites*); rose (*Rosa* spp.); snowbush (*Ceanothus velutinus*); red-stemmed ceanothus (*Ceanothus sanguineus*); red-osier dogwood (*Cornus sericea*); high-bush cranberry (*Viburnum edule*); huckleberry (*Vaccinium* spp.); beaked hazelnut (*Corylus cornuta*); thimbleberry (*Rubus parviflorus*); Oregon-grape (*Mahonia aquifolium* spp.); raspberry (*Rubus* spp.); and Arboreal lichens, specifically *Alectoria* spp., *Bryoria* spp., and *Usnea* spp..



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Appendix 2a

Wildlife: Pacific Giant Salamander



ORDER – Wildlife Habitat Areas
2-120 to 2-128, 2-130 to 2-138, 2-148 and 2-149
Pacific Giant Salamander - Chilliwack Forest District

This order is given under the authority of sections 9(2) and 10(1) of the *Government Actions Regulation* (B.C. Reg. 582/04).

The Deputy Minister of Environment orders that:

1. the wildlife habitat areas (WHAs) shown in the map set out in the attached Schedule A (2-120 to 2-128, 2-130 to 2-138, 2-148 to 2-149) and boundaries contained in the GIS file *twha_bc* are established for Pacific Giant Salamander (also known as the Coastal Giant Salamander) (*Dicamptodon tenebrosus*);
2. the general wildlife measures outlined in Schedule 1, of this order, are established for the WHAs in the attached Schedule A and boundaries contained in the GIS file *twha_bc*;
3. for the purposes of section 2(3)(a) of the *Government Actions Regulation*, these General Wildlife Measures apply to minor tenures;
4. where there is discrepancy between the WHA boundaries as shown in the attached Schedule A and the GIS file *twha_bc*, the boundaries as detailed in the GIS file will take precedent. The centre point of the line on the map denoting the WHA is what establishes the boundary; and
5. pursuant to section 7(3) of the *Forest Planning and Practices Regulation* the person(s) required to prepare a forest stewardship plan are hereby exempted from the obligation to prepare results or strategies in relation to the objective set out in section 7(1) of the *Forest Planning and Practices Regulation* for Coastal Giant Salamander in the Notice for the Chilliwack Forest District.

Schedule 1 – General Wildlife Measures

Access:

- Do not construct roads, trails, landings or stream crossings in the WHA, except where an exemption has been granted under section 92(1) of the *Forest Planning and Practices Regulation*. An exemption is not required to construct road WL1000 through WHA 2-124.
- Where roads, trails, landings or stream crossings are authorized in the WHA, they should be temporary wherever possible and constructed with minimum road bed and right-of-way widths. During construction near streams, ensure that water quality is maintained by controlling erosion and sediment sources and prevent water diversion (e.g. re-vegetate exposed soil with native grasses).
- When no longer in use, roads, trails, landings or stream crossings should be deactivated using methods that minimize risk of water diversion, stream sedimentation and erosion.
- Ensure road maintenance activities, including activities to address safety concerns, use methods that minimize risk of water diversion, stream sedimentation and erosion.
- Where road construction options are present, whenever practicable construct roads downslope of WHAs. If constructed upslope, implement sediment and erosion control measures to maintain water quality, and prevent water diversion.
- Approved stream crossings must use open-bottom structures to ensure unimpeded upstream and downstream movement for salamanders (i.e. bridges or open-bottom culverts).

Harvesting:

- Do not harvest in the core area of the WHA, except in the right-of-way, where road construction has been authorized.
- Within all riparian areas in the management zone, use partial harvesting systems that maintain 70% basal area, ensure the core area is wind firm and maintain forest structure and cover by retention of multi-layered canopy, snags and coarse woody debris.
- Within all upland areas in the management zone, ensure harvesting maintains shade and microclimatic conditions by retaining non-merchantable conifers and understory deciduous trees, shrubs, herbaceous vegetation, and at least 30% of merchantable trees. Retain wildlife trees where safe. Also maintain all coarse woody debris and ground structure (i.e. small mammal burrows, root channels, shrubs) to facilitate salamander dispersal between streams.
- Do not salvage timber anywhere within the WHA.
- Fall and yard away from all streams in the core area or riparian management zone. Retain those trees that cannot be safely felled away from streams as either part of the basal area retention percent or in wildlife tree patches.
- Remove slash and debris that inadvertently enters the stream, unless it will destabilize the bank or channel. Place slash and debris well above the high water mark in a stable manner.
- Avoid burning in the WHA, except debris piles on landings.
- Use equipment that minimizes ground disturbance (e.g. consider operating on frozen ground or using systems that require less road).

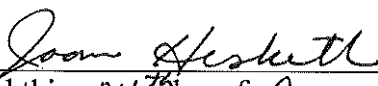
- If the WHA is overlapped by another WHA for a different species, ensure partial harvest strategy is coordinated between the general wildlife measures. The most conservative measure must apply to the overlapped area.

Silviculture & Pesticides:

- Use silviculture strategies that minimize ground disturbance.
- Do not use pesticides.

Recreation:

- Do not establish recreational sites, trails, facilities, or structures within the WHA.


Signed this 24th day of August, 2007
Joan Hesketh, Deputy Minister
Ministry of Environment

Appendix 1:

The following information is intended to provide background information and support to the legal order establishing these WHAs. This appendix is not part of the legal order.

1. Authority to consider an exemption from these general wildlife measures is provided in Section 92(1) of the *Forest Planning and Practices Regulation*. In instances where it is not practicable to comply with these measures, a person proposing to conduct forestry activities should consider seeking an exemption from the requirements to comply with the applicable General Wildlife Measures.
2. An exemption application should be submitted to the Minister's delegate (Regional Manager – Ministry of Environment, for the Region that the WHA is located) with a rationale describing the nature of the problem and options to integrate WHA conservation with proposed forest practices. This submission will assist in timely consideration of the matter, and will inform the conditions, if any, of the exemption that may be granted prior to commencement of activities. Upon receipt of a complete exemption application, a determination will normally be made within 30 days of arrival. Incomplete packages will be returned to the proponent for resubmission.



**ORDER – WILDLIFE HABITAT AREAS 2-580 to 2-587, 2-589 to 2-592, 2-594, 2-595,
2-656 to 2-661 & 2-663 to 2-666**
Pacific Giant Salamander – Chilliwack Forest District

This Order is given under the authority of sections 9(2) and 10(1) of the *Government Actions Regulation* (B.C. Reg. 582/2004) (GAR).

1. The delegated decision maker, being satisfied that the following area contains habitat that is necessary to meet the habitat requirements of a species at risk – Pacific Giant Salamander (*Dicamptodon tenebrosus*) orders that
 - a) the areas shown in the map set out in the attached Schedule A (2-580 to 2-587, 2-589 to 2-592, 2-594, 2-595, 2-656 to 2-661 & 2-663 to 2-666) and contained in the wildlife habitat area (WHA) spatial layer stored in the Geographic Warehouse (WHSE_WILDLIFE_MANAGEMENT.WCP_WILDLIFE_HABITAT_AREA_POLY) are established as wildlife habitat areas 2-580 to 2-587, 2-589 to 2-592, 2-594, 2-595, 2-656 to 2-661 & 2-663 to 2-666 for Pacific Giant Salamander. The centre point of the line on the attached Schedule A is what establishes the WHAs; and
 - b) if there is a discrepancy between the areas shown in the map set out in the attached Schedule A and the WHA spatial layer stored in the Geographic Warehouse (WHSE_WILDLIFE_MANAGEMENT.WCP_WILDLIFE_HABITAT_AREA_POLY), the areas as detailed in the WHA spatial layer will take precedent.
2. The delegated decision maker, being satisfied that
 - i. the general wildlife measures (GWMs) described below are necessary to protect and conserve the WHAs being established for Pacific Giant Salamander; and
 - ii. GAR or another enactment does not otherwise provide for that protection or conservation;orders that
 - a) the GWMs outlined in Schedule 1 are established for WHAs 2-580 to 2-587, 2-589 to 2-592, 2-594, 2-595, 2-656 to 2-661 & 2-663 to 2-666.

Definitions:

Words and expressions not defined in this Order have the meaning given to them in the *Forest and Range Practices Act* (FRPA) and the regulations made under it, unless context indicates otherwise.

Traditional and cultural activities are as defined in the *Free Use Permit Regulation* of the *Forest Act*.

Schedule 1 – General Wildlife Measures:

Access:

- 1) Do not construct roads, trails, landings or stream crossings in the Core Area or Riparian Management Zone.
- 2) GWM 1 does not apply if:
 - a) road construction of road G and associated stream crossings are required through WHA 2-587 to access timber in cut block MP2B; or
 - b) road construction of branch BR724 and associated stream crossings are required through WHA 2-664 to access adjacent timber.
- 3) Do not construct roads, trails, landings, or stream crossings in the Upland Management Zone, unless no other practicable option exists:
 - a) where roads, trails or landings are determined necessary and are constructed in the Upland Management Zone, they are to be:
 - i) designed as temporary roads wherever practicable, and when temporary, deactivated within one year after regeneration date if practicable; or otherwise within one year after the last silviculture treatment performed to achieve free to grow;
 - ii) constructed to result in minimum road bed and right-of-way clearing widths;
 - iii) designed to result in no sediment entering any nearby streams, which includes re-vegetating all exposed soils using native grasses; and
 - iv) designed to result in no diversion to water features from their natural source.
 - b) where stream crossings are determined necessary and are constructed in the Upland Management Zone, they are to be:
 - i) designed as temporary wherever practicable, and when temporary, deactivated within one year after regeneration date if practicable; or otherwise within one year after the last silviculture treatment performed to achieve free to grow;
 - ii) designed as clear span or open bottom structures of sufficient size to result in no encroachment on the stream channel width and no potential to divert water from its natural source; and
 - iii) designed to result in no sediment, associated with the crossing structure, entering the stream, which includes re-vegetating all exposed soils using native grasses.

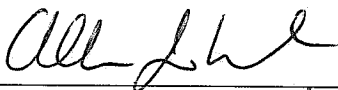
Harvesting:

- 4) Do not harvest timber in the Core Area.
- 5) GWM 4 does not apply if:
 - a) timber harvesting occurs in block CV702 within WHA 2-594, and in block MP2B within WHA 2-587;
 - b) it is necessary to create guyline tiebacks (anchors or tailholds) in the Core Area for timber harvesting associated with landings/cut blocks outside the Core Area;
 - c) trees felled in accordance with GWM 5 (b) are retained on-site to function as coarse woody debris, unless the felled tree poses a forest health risk; or
 - d) cutting of trees is for the purposes of traditional and cultural activities, as authorized under a Free Use Permit issued under the *Forest Act*.

- 6) For timber harvesting within the Riparian Management Zone:
 - a) use partial harvesting systems that result in maintaining at least 70% basal area;
 - b) partial harvesting is to be planned to result in windfirmness of the Core Area;
 - c) partial harvesting is to result in maintaining pre-harvest forest structure by retaining a multi-layered canopy, all safe snags/wildlife trees, and coarse woody debris;
 - d) GWM 6 a), b) and c) do not apply to harvesting in:
 - i) Block VE118 in WHA 2-660;
 - ii) Block CV702 in WHA 2-594; and
 - iii) Block MP2B in WHA 2-587.
- 7) For timber harvesting within the Upland Management Zone, ensure harvesting results in:
 - a) maintaining shade and microclimatic conditions by retaining at least 30% of basal area, and all safe non-merchantable conifers and understory deciduous trees, shrubs and herbaceous vegetation;
 - b) retaining all safe snags/wildlife trees;
 - c) falling and yarding away from streams wherever practicable; and
 - d) protecting all coarse woody debris and ground structure (i.e. small mammal burrows, root channels, shrubs) to facilitate Pacific Giant Salamander dispersal between streams.
- 8) Do not salvage timber within the WHA.
- 9) Fall and yard away from all streams in the Core Area and Riparian Management Zone. Retain those trees that cannot be safely felled away from streams as either part of the basal area retention or in wildlife tree patches.
- 10) Remove slash and debris that inadvertently enters a stream in the shortest time frame possible, and use removal methods that minimize stream bank and channel disturbance. Leave slash and debris that enters a stream only if removing it will destabilize the bank or stream channel. When slash and debris is removed, place it well above the high water mark in a safe and stable manner.
- 11) Do not broadcast burn in the Core Area and Riparian Management Zone. Burning debris piles on landings in the Upland Management Zone is permitted.

Pesticides:

- 12) Do not use pesticides, except for:
 - a) *Bacillus thuringiensis* var *kurstaki* for the control of western spruce budworm;
 - b) beetle pheromones for the control of bark beetles; or
 - c) herbicides to control invasive plants or noxious weeds, if applied by:
 - i) stem injection, cut and paint, foliar wipe or other direct plant application; or
 - ii) spot spraying individual plants or a cluster of plants if direct plant application is not practicable.



Signed this 21 day of August, 2017

Allan Johnsrude, Regional Executive Director
South Coast Natural Resource Region

Ministry of Forests, Lands, Natural Resource Operations and Rural Development

Appendix 1:

The following information is provided as background information and support to the Order establishing WHAs 2-580 to 2-587, 2-589 to 2-592, 2-594, 2-595, 2-656 to 2-661 & 2-663 to 2-666. This appendix is not part of the Order.

1. **Activities to which the Order does not apply:** Section 2(2) of the *Government Actions Regulation* states

An Order under any of sections 5 to 15 does not apply in respect of

- (a) any of the following entered into before the Order takes effect:
 - (i) a cutting permit;
 - (ii) a road permit;
 - (iii) a timber sale licence that does not provide for cutting permits;
 - (iv) a forestry licence to cut issued by a timber sales manager under section 47.6 (3) of the *Forest Act*;
 - (v) subject to subsection (3), a minor tenure,
- (b) a declared area,
- (c) areas described in section 196 (1) of the Act, and
- (d) areas referred to in section 110 of the *Forest Planning and Practices Regulation* (FPPR).

2. Authority to consider an exemption from these GWMs is provided in section 92(1) of the FPPR, and section 79(1) of the *Woodlot License Planning and Practices Regulation*. An exemption may be provided if the Minister's delegate is satisfied that the intent of the GWM will be achieved or that compliance with the provision is not practicable, given the circumstances or conditions applicable to a particular area.

An exemption application should be submitted to the Minister's delegate (FLNR, Director of Resource Management) with a rationale describing the nature of the problem and options to integrate Pacific Giant Salamander conservation with proposed forest and/or range practices. This submission will assist in timely consideration of the matter, and will inform the conditions, if any, of the exemption that may be granted prior to commencement of activities. Upon receipt of a complete exemption application, a determination will normally be made within 14 calendar days of arrival at the FLNR regional office. Incomplete packages will be returned to the proponent for re-submission. A template for exemption requests is available at:
<http://www.env.gov.bc.ca/wld/frpa/index.html>

3. GWMs 1 and 3 do not apply to road or stream crossing maintenance, deactivation or brushing within the right-of-way on existing roads or stream crossings in the WHA. These activities should use methods that minimize risk of water diversion, stream sedimentation and erosion or slope failure. All work should be carried out in a manner that will not affect the intent or integrity of the WHA.
4. Regarding GWM 1, this access prohibition applies to the Core Area (30m wide) and Riparian Management Zone (20m wide). However, in situations where there is no other practicable option and it is determined that roads, trails, landings or stream crossings may be necessary they may be approved via exemption. The exemption conditions will usually state:

- a) that roads and stream crossings are to be temporary, except if required as mainline roads or bridges, and are to be designed and constructed with minimum road bed and right-of-way clearing widths;
 - b) that landings and trails are to be temporary;
 - c) during any design, construction, or maintenance activity near water features, ensure that water quality is maintained by avoiding slope failures, controlling erosion and sediment sources (e.g. revegetate exposed soil with native grasses), and prevent water diversion;
 - d) all roads, trails, landings or stream crossings, except mainline roads or mainline stream crossings, are to be deactivated within one year after regeneration date if practicable; or otherwise within one year after the last silviculture treatment performed to achieve free to grow. Deactivation methods are to minimize risk of water diversion, slope failure, stream sedimentation and erosion; and
 - e) stream crossings, either temporary or permanent, must use open-bottom or clear span structures of sufficient size to ensure the structure does not encroach on the stream channel width, and maintains unimpeded upstream and downstream movement for Pacific Giant Salamander (i.e. use bridges of sufficient length or open-bottom culverts).
5. Specific to GWM 2, the expectations for these exempted roads and stream crossings is that they will be designed, constructed and managed wherever possible in keeping with the same conditions as those specified in Appendix clause #4 above.
 6. In regards to exemptions provided in GWM 2, 5 and 6 for roads, stream crossings and/or cutblocks, the exemptions are based on maps or emails provided to FLNR as follows:
 - a) For Ts'elxwéyeqw Tribe Management Limited Road G, stream crossings and block MP2B in WHA 2-587, the map referred to is dated May 26, 2015;
 - b) For BC Timber Sales block VE118 in WHA 2-660, the map referred to is dated October 1, 2015;
 - c) For Western Canadian Timber Products (WCTP) block CV702 in WHA 2-594, the map referred to is dated February 22, 2016;
 - d) For WCTP road BR724 and stream crossings in WHA 2-664, the map referred to is from an email dated August 11, 2016 (from Greg Peterson, WCTP to Greg George, FLNR). The road switchbacks off of the mainline, just east of and avoids, the WHA Core Area. In this situation, it has been determined by a qualified person that there is no other practicable option for the road location.
 7. For block MP2B in WHA 2-587, it is understood that road G and the various stream crossings are temporary and will be deactivated within one year after regeneration date if practicable; or otherwise within one year after the last silviculture treatment performed to achieve free to grow. Deactivation methods are to minimize risk of water diversion, slope failure, stream sedimentation and erosion.
 8. The intent of GWMs 6 and 7 is to maintain sufficient forest structure in the two WHA Management Zones (i.e. riparian and upland) to sustain microclimate at the ground level, including temperature and moisture regime. This will provide suitable habitat conditions for connectivity and overland dispersal opportunity to Pacific Giant Salamanders, when moving through upland areas to nearby streams (maintaining dispersal habitat is described as a recovery goal in the provincial recovery strategy). Although Pacific Giant Salamanders are poor dispersers, it remains important to provide

dispersal opportunity for genetic exchange and population viability among BC salamanders since the BC population is known to be less genetically diverse than, and isolated from, populations in Washington State. To protect coarse woody debris and ground structure use equipment for harvesting and silviculture that minimizes ground disturbance or soil compaction (e.g. consider operating on frozen ground or using systems that require less skid road).

9. In regards to generally locating roads, trails or stream crossings, where options exist and wherever practicable, construct roads, trails or crossings downslope of WHAs. If constructed upslope, implement sediment and erosion (or slope failure) control measures to maintain water quality and prevent water diversion. Silt or sediment, if introduced, will fill-in cracks and crevices and reduce shelter between stream substrates that are required by Pacific Giant Salamander larvae.
10. In regards to accurately mapping WHA water features, it is acknowledged that accuracy is limited to that of the underlying map base (usually 1:20,000 TRIM). If a map error occurs between the projected map location of a stream or wetland and its actual on the ground location, the on-ground location takes precedence. Proponents that notice this map error are asked to submit the actual stream location to the Director of Resource Management, South Coast Natural Resource Region, FLNR (via ESRI shape files) so that the WHA boundary location can be corrected.
11. Proponents should notify the Director of Resource Management, South Coast Natural Resource Region, FLNR when deactivation of temporary/spur roads is complete.
12. Anyone required to implement this Order should also be aware of potential overlap between these WHAs and other Orders (mostly for Pacific Water Shrew, Tall Bugbane or Spotted Owl WHA; but also for UWR) and that there may be other GWMs that apply in each WHA. If this occurs, it will be important to follow the most conservative GWM for the overlapping area.
13. These GWMs do not apply to persons who must comply with the *Worker's Compensation Act* and the regulations under that Act (e.g. danger tree felling, OH&S Regulation part 26). Where a GWM cannot be achieved due to a safety concern, a person should consider developing a rationale related to the safety issue and keep it on file to be made available to a government official upon request. Consistent with section 2(3) of the FPPR, exemptions from these GWMs are not required to meet safety requirements.

COASTAL GIANT SALAMANDER

Dicamptodon tenebrosus

Original prepared by Barbara E. Johnston

Species Information

Taxonomy

The Coastal Giant Salamander belongs to the Dicamptodontidae family (Good 1989). This group was originally considered to be a subfamily of Ambystomatidae. However, taxonomic analysis by Edwards (1976) and Estes (1981) found *Dicamptodon* to have several unique morphological and neurological traits that warrant distinct family status. Dicamptodontidae is an ancient lineage (Peabody 1954) that first appears in the fossil record of the lower Pliocene.

Within the subfamily Dicamptodontinae, Good (1989) recognized four distinct species on the basis of allozymes: *Dicamptodon aterrimus*, *D. copei*, *D. ensatus*, and *D. tenebrosus*. Prior to this analysis, *D. tenebrosus* and *D. ensatus* were considered to be one species called *D. ensatus*. These two species are similar in appearance and life history, but geographically disjunct. There are no recognized subspecies of *D. tenebrosus*.

Description

Coastal Giant Salamander larvae are ~33–35 mm in total length at hatching (Nussbaum and Clothier 1973). They are dark dorsally with light underbellies, have shovel-shaped heads, gills, and tail fins. If larvae transform into terrestrial adults, they usually do so between the sizes of 92 and 166 mm total length (Nussbaum et al. 1983). Some adults do not transform and remain obligate streams dwellers. These neotenes can grow up to 351 mm total length (Nussbaum et al. 1983). Terrestrial adults are heavy bodied and broad headed. They are dark brown to black dorsally and usually marbled with tan or copper (Farr 1989). Larger adults are noticeably less marbled than small individuals, suggesting

these markings fade with age (B. Johnston, pers. obs.). Coastal Giant Salamanders are the only salamanders capable of true vocalization, with adults emitting bark-like cries when disturbed (Nussbaum et al. 1983).

Distribution

Global

The range of the Coastal Giant Salamander extends along the western coast of North America from southwestern British Columbia, through the Cascade and Coast Ranges, to northwestern California (Nussbaum and Clothier 1973; Nussbaum et al. 1983).

British Columbia

In British Columbia, the Coastal Giant Salamander is restricted to the Chilliwack River Valley and a few small nearby tributaries of the Fraser River. In this region, larvae have been recorded in ~60 headwater streams (Farr 1989; Haycock 1991; Richardson and Neill 1995, 1998). Their range appears to be continuous, extending from the west side of Vedder Mountain to the slopes east of Chilliwack Lake (Richardson and Neill 1995). The population on the west side of Vedder Mountain may now be isolated because of modifications to the drainage system of this area (Farr 1989).

Forest region and district

Coast: Chilliwack

Ecoprovinces and ecoregions

COM: NWC, SPR

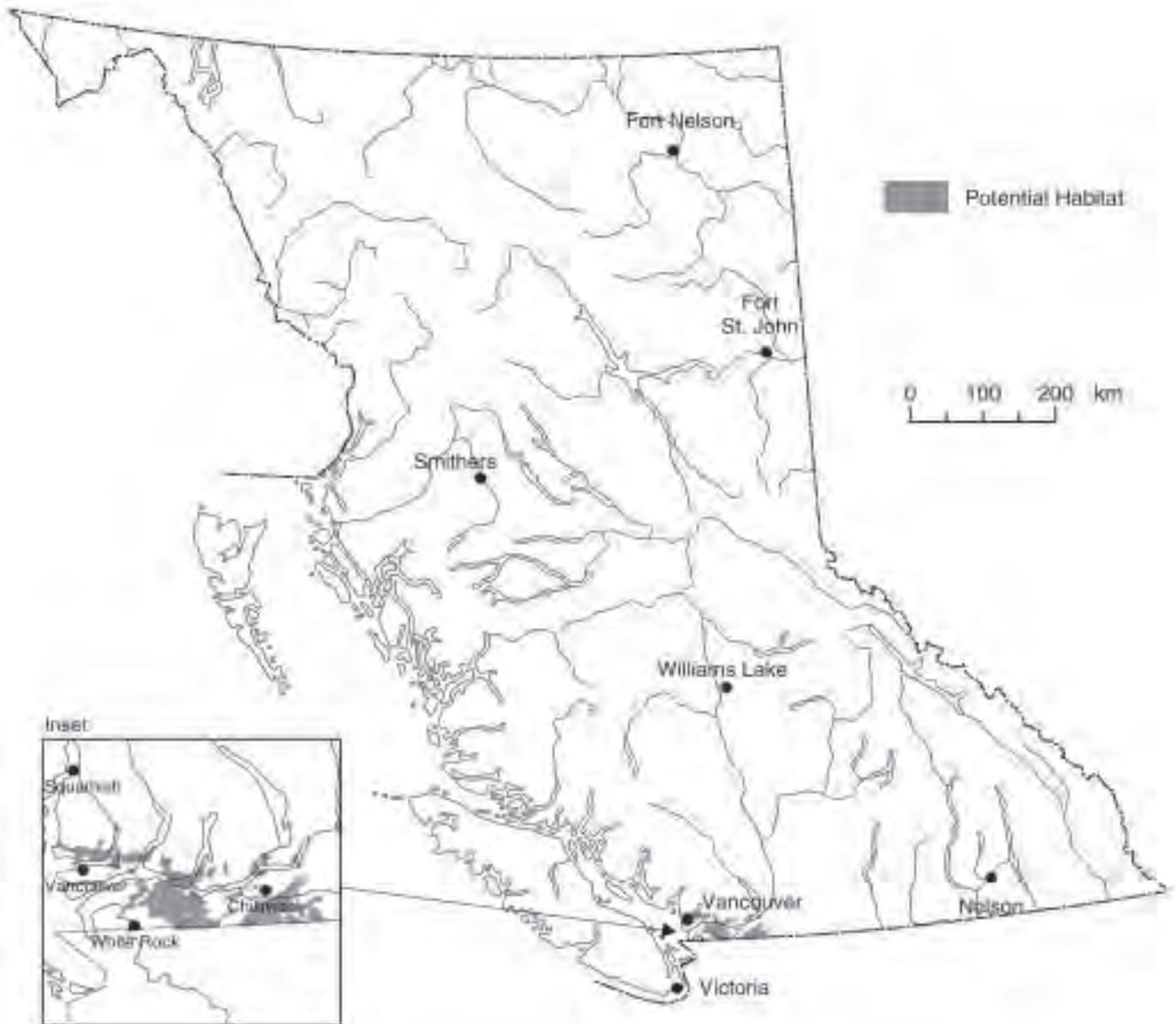
GED: FRL, GEL

Biogeoclimatic units

CWH: dm, ds1, ms1, vm2, xm1

MH: mm1, mm2

Coastal Giant Salamander (*Dicamptodon tenebrosus*)



Note: This map represents a broad view of the distribution of potential habitat used by this species. The map is based on several ecosystem classifications (Ecoregion, Biogeoclimatic and Broad Ecosystem Inventory) as well as current knowledge of the species' habitat preferences. This species may or may not occur in all areas indicated.

Broad ecosystem units

CR, CW, FR, LL, LS, MF

Elevation

Sea level to 2160 m

Life History

Diet and foraging behaviour

Both larval and adult Coastal Giant Salamanders are opportunistic feeders. The aquatic larvae feed nocturnally on aquatic insects (i.e., caddisflies, stoneflies, dipterans, and beetles), benthos, small fish, and Tailed Frog larvae (Antonelli et al. 1972; Nussbaum et al. 1983; Parker 1994). Terrestrial adults feed on land snails, slugs, beetles, caddisfly larvae, moths, flies, small mammals such as shrews, and other amphibians (Stebbins 1951). Other unusual items such as lizards, garter snakes, and feathers have been found in the stomach contents of adults (Bury 1972; Nussbaum et al. 1983). Cannibalism has been noted in both larval and adult life stages of this species (Anderson 1960; Nussbaum et al. 1983).

Reproduction

Coastal Giant Salamanders are believed to breed once every 2 years (Nussbaum 1976). In California and Oregon, breeding can occur in either spring or fall (Nussbaum et al. 1983). Preliminary evidence from British Columbia suggests the timing of breeding is variable and may occur throughout the May to October active season (Haycock 1991; Ferguson 1998). Age at first reproduction remains unknown.

Montane streams are implied as breeding habitat for this species based on the observation of very small larvae in this habitat type (Haycock 1991; Nussbaum 1969; Henry and Twitty 1940). Only four known nest sites have been described from the field, all within the United States (Jones et al. 1990). The nests were located (1) in a stable talus and earth bank adjacent to a stream (Nussbaum 1969), (2) within a rock pile at the base of a waterfall (Nussbaum 1969), (3) on a submerged piece of

lumber from a bridge crossing a fast flowing stream (Henry and Twitty 1940) and (4) on a partly rotted log in a riffle at the edge of a small stream (Jones et al. 1990).

On the basis of a few field and aquaria observations, Nussbaum et al. (1983) suggested that courtship occurs in hidden, water-filled nest chambers beneath logs and stones.

Males deposit up to 16 spermatophores. Females pick up one or two spermatophores with their cloacae and deposit a clutch of 135–200 eggs in the nest chamber (Nussbaum et al. 1983). Eggs are usually attached singly on the chamber roof.

In the field, adult salamanders have been observed near a developing clutch. This observation has been interpreted as females tending their own eggs (Farr 1989). Nussbaum et al. (1983) state a female will stay in the nest until the eggs hatch and the young abandon the nest chamber, a period of up to 200 days.

Coastal Giant Salamanders take approximately 35 days to develop to tail bud stage (Nussbaum 1969) and a further 5 months until hatching (Henry and Twitty 1940). Newly hatched larvae remain buried in the substrate and attached to their yolk sac for a further 3–4 months before appearing in streams at 45–51 mm in total length (Nussbaum and Clothier 1973). The larval period is believed to last between 2 and 6 years, averaging 3–4 years (Duellman and Trueb 1986; Ferguson 1998). Larval survivorship until adulthood is estimated at ~1–4% (Ferguson 1998), with predation and desiccation acting as the chief agents of mortality (Nussbaum and Clothier 1973).

At the end of the larval period, Coastal Giant Salamanders either transform into terrestrial salamanders or remain in their natal habitat as neotenes. The frequency of neoteny varies between populations and it is unclear whether this phenomenon is genetically or environmentally determined. The lifespan of this species is unknown. Studies of similarly sized aquatic salamanders suggest they may live up to 25 years (Duellman and Trueb 1986).

Home range

In aquaria, Coastal Giant Salamanders are reported to exhibit territorial behavior (Nussbaum et al. 1983). Terrestrial Coastal Giant Salamanders do not appear to occupy a home range. Over the course of one active season (June to September), individuals rarely returned to previously visited locations (Johnston 1998).

Site fidelity, movement, and dispersal

Coastal Giant Salamanders are highly sedentary, generally spending their entire life cycle in one creek (Farr 1989). Two mark-recapture studies conducted on larvae in the Chilliwack Valley found, respectively, that 73% of larvae remained within 10 m of their initial location of capture over 3 years (Neill 1998), and that only 10% of larvae moved farther than 20 m over 2 years (Ferguson 1998).

Terrestrial adults travel farther than larvae (commonly moving 10–50 m over a short time), but rarely move between streams (Johnston 1998). A radio-telemetry study in the Chilliwack Valley found that terrestrial adults are primarily active at night, with 70% of all movements occurring between dusk and dawn. The animals moved more frequently when it was raining. During dry periods, their movements were restricted to times of low temperatures (Johnston 1998). Based on the frequency and distance of movements, Johnston (1998) estimated that the probability of a terrestrial adult dispersing to an adjacent stream 0.5 km away was well below 1 in 1000 over the yearly active period. A genetic study conducted in the Chilliwack Valley found subpopulations to be moderately linked, indicating at least some dispersal between adjacent streams (Curtis and Taylor 2003).

The movement and dispersal patterns of juvenile Coastal Giant Salamanders (individuals recently transformed from aquatic to terrestrial phase) have not been studied. It is possible that juveniles are responsible for most of the dispersal, as is the case in many other species including some amphibians (Horn 1983; Duellman and Trueb 1986).

Habitat

Structural stage

- 4: pole/sapling
- 5: young forest
- 6: mature forest
- 7: old forest

Usually associated with structural stages 6 and 7, but have been recorded in stages 4–7. Habitat use may be more associated with specific habitat features than with structural stage.

Important habitats and habitat features

Aquatic

Suitable habitat for aquatic Coastal Giant Salamanders is generally found in clear, cool, fast-flowing and well-oxygenated streams with step-pool morphology and sufficient hiding cover (i.e., rocks, debris, and overhanging stream banks). Investigations into habitat use suggest that larvae predominantly use pocket pools (pools of small size) (Haycock 1991; Mallory 1996; Hatziantoniou 1999). Both stream depth and stream width are good predictors of larval salamander abundance, with abundance frequently decreasing with increasing wetted width (Richardson and Neill 1995) and with increasing depth (Southerland 1986; Tumlinson et al. 1990). Larval abundance has also been positively correlated with the number of substrate crevices and cover objects available (Hall et al. 1978; Murphy and Hall 1981; Conner et al. 1988; Parker 1991).

Terrestrial

Suitable terrestrial habitat is generally found in moist forested areas with ample hiding cover and in close proximity to streams. Eighty-four percent ($n = 19$) of the terrestrial adults captured using time-constrained searches in unmanaged forests in Oregon were found within 10 m of a stream (Vesely 1996). Johnston (1998) radio-tracked 18 terrestrial Coastal Giant Salamanders in old-growth and second-growth habitat in the Chilliwack and Nooksack River valleys. On average, 67% of each animal's recorded locations were within 5 m of the water's edge. The most common refuge locations

used by terrestrial adults in this study were in/under coarse woody debris (38% of recorded refuges), underground (likely in small mammal burrows and root channels) (31%), and under rocks (26%). Any structure that provides a moist microsite appears to make a suitable resting site. When using coarse woody debris, terrestrial Coastal Giant Salamanders appear to select older wood in advanced stages of decay (classes 3–5) over newly fallen wood (Johnston 1998). Overwintering habitat does not appear to be a limiting factor for terrestrial adults. They tend to overwinter in the same types of refuges used throughout the active season, most commonly in underground burrows and seeps (B. Johnston, pers. obs.).

Suitable nesting sites may be the most critical habitat attribute for Coastal Giant Salamanders (Farr 1989). Only four nest sites have been described from the field (Henry and Twitty 1940; Nussbaum 1969; Jones et al. 1990). Each was located in a secure area (under rocks or wood) in or adjacent to a stream.

Conservation and Management

Status

The Coastal Giant Salamander is on the provincial *Red List* in British Columbia. It is designated as *Threatened* in Canada (COSEWIC 2002).

Summary of ABI status in BC and adjacent jurisdictions (NatureServe Explorer 2002)

BC	CA	OR	WA	Canada	Global
S2	S7	S4	S5	N2	G5

Trends

Population trends

Population estimates for Coastal Giant Salamanders are very difficult to determine. The terrestrial life stage is primarily fossorial (only above ground and visible about 1% of the time; Neill 1998) and aquatic individuals are remarkably discrete within streams.

Roughly estimated, the population of Coastal Giant Salamanders in British Columbia is ~13 000 terrestrial adults and 4500–9000 neotenic adults (Ferguson and Johnston 2000). Coastal Giant Salamanders have been found in 15 of 20 stream systems in the Chilliwack Valley and associated areas, for a total of 75 occupied streams.

No long-term study of Coastal Giant Salamanders has been conducted to monitor the population's stability in the Chilliwack area. The Sumas Lake and the Vedder River areas may have historically supported populations of this species. In the 1920s, these populations were likely lost when Sumas Lake was drained for agricultural purposes and Vedder Creek was channeled north, becoming the Vedder Canal.

Habitat trends

Suitable habitat is declining in British Columbia. The Lower Mainland is the most populated area of the province. Since 1827, the area of coniferous forest declined from 71 to 54% in the lower Fraser Basin ecosystem, while urban and agriculture use increased by 26% (Boyle et al. 1997).

Headwater streams receive little or no protection during timber harvesting. Timber harvesting is occurring throughout the Chilliwack River Valley. In the past 15 years (since ~1985), ~2500 ha have been logged (either clearcut or partial cut) within the known range of the Coastal Giant Salamander (MOF, Chilliwack Forest District). Following an 80-year harvest rotation, much of the remaining mature second growth will likely undergo second rotation cutting beginning around 2013. Urban development also continues to progress east up the Chilliwack Valley and into surrounding hillsides. Increasing habitat fragmentation (forest and stream habitats) is further reducing the quality of the remaining habitat.

Threats

Population threats

Like all amphibians, Coastal Giant Salamanders are highly dependent on moisture for dermal

respiration. Transformed adults receive ~66% of their oxygen through the skin (Clothier 1971) and are thus sensitive to a loss of shading and cover objects. This water dependence limits the habitats they can exploit.

Studies conducted in the Chilliwack Valley suggest that both larval and terrestrial Coastal Giant Salamanders have limited dispersal tendencies. From 1996 to 1998, W.E. Neill (unpubl. data) found that fewer than 2% of marked larvae ($n > 2500$) traveled > 50 m annually. Mean annual movements were estimated at < 2 m from the site of first capture. Similarly, Ferguson (1998) found that 90% of marked larvae moved < 20 m (cumulative distance) over 1 year. In 1996 and 1997; Ferguson (2000) experimentally depleted 25–40 m reaches of four streams in the Chilliwack Valley to assess recolonization rates. One year after depletion, only 4–5% of the marked larvae from neighbouring reaches had colonized the depleted area. Ferguson (2000) estimated that full recolonization of a 400 m disturbed reach would require 8–55 years. Terrestrial Coastal Giant Salamanders also appear to have limited dispersal. Using a dispersal probability model developed from radio-telemetry data, Johnston (1998) concluded that the probability of a terrestrial adult dispersing between streams in the Chilliwack Valley was far less than 1 in 1000 over the yearly active period.

Dispersal or recolonization limitation in this species is supported by survey work conducted by Richardson and Neill (1995) in the Chilliwack Valley, where Coastal Giant Salamanders were detected in only 22 of 59 (37%) seemingly habitable streams. Results of a transplant experiment conducted in 1996 in the Chilliwack Valley, in which 53 larvae were introduced into an unoccupied stream, suggest that at least some of these uninhabited streams are able to sustain populations of aquatic giant salamanders (W.E. Neill, unpubl. data). Larval survival and growth estimates in the 2 years following introduction were indistinguishable from those at naturally occupied streams.

Several fish species have been shown to prey on giant salamander larvae, and it has been suggested that

fish stocking in the Chilliwack River may inflict significant mortality on this species (Orchard 1984).

Coastal Giant Salamanders reach the northern extent of their range 19.5 km north of the Canada–U.S. border. Populations found in the Chilliwack region may therefore be particularly vulnerable. Populations on the periphery often have lower population densities, slower growth rates, and lower fecundity than those in the centre of a species' range (Hengeveld 1990; Lawton 1993). This lower viability is presumably due to climatic, competitive, or predation gradients, which increase towards range margins and, ultimately, limit species expansion. Larval densities and growth rates in British Columbia (Ferguson 1998; W.E. Neill, unpubl. data) appear to be lower than reported in Oregon (Nussbaum and Clothier 1973), the centre of the species range. The larval phase tends to be prolonged in Canadian populations (2–3 times longer than in Oregon; Ferguson 1998). If the annual survival rate of larval Coastal Giant Salamanders is relatively consistent across the species' geographic range, the fact that Canadian salamanders take longer to reach adulthood (reproductive age) means that the average survival rate to reproductive age is lower in British Columbia than in areas farther south.

Little is known of the effects of pesticides on Coastal Giant Salamanders. A common herbicide used in the Chilliwack Valley is glyphosate. This chemical is thought to have low toxicity; however, some authors have suggested that adverse effects may be subtle (Ferguson and Johnston 2000). Ouellet et al. (1997) found a high prevalence of hindlimb deformities in some frog (*Rana* spp.) and toads (*Bufo americanus*) from agricultural sites exposed to pesticide runoff.

Habitat threats

Forest management and urban development are the main threats to the habitats of Coastal Giant Salamanders. There are several possible causes for declines in amphibian populations following forest harvesting. Some direct mortality occurs during logging operations. This has been observed at three sites in the Chilliwack Valley (K. Mallory, pers. comm.). Canopy removal results in microclimatic

changes (Chen et al. 1993, 1995; Brososfke et al. 1997) that may increase physiological stress on terrestrial amphibians, leading to reduced fitness or death. Logging and associated road building degrades stream habitat by increasing sedimentation and causing increases in summer stream temperatures (Newbold et al. 1980; Beschta et al. 1987; Hartman and Scrivener 1990). These changes may influence the growth rate of aquatic amphibians, as well as their ability to respire, find food, and take refuge from predators. Streams may become ephemeral after logging or dry up altogether. Given that many amphibian species, including Coastal Giant Salamanders, are obligate stream dwellers for a portion of their life, these changes constitute critical habitat loss.

Most studies of aquatic Coastal Giant Salamanders in the coastal Northwest have inferred logging effects by correlating larval density to the age of the surrounding forest. Results of these studies have been mixed, with some finding reduced density in logged stands (Bury 1983; Bury and Corn 1988; Connor et al. 1988; Corn and Bury 1989; Cole et al. 1997), others finding no effect (Hawkins et al. 1983; Kelsey 1995), and still others finding increased density in logged areas (Murphy et al. 1981; Murphy and Hall 1981). In their recent study conducted in Oregon, Biek et al. (2002) compared the abundance of larvae on the interface of recent clearcuts and mature forest. They found the abundance of larvae in headwater streams to be markedly lower in clearcuts than in downstream mature forest stands. Without examining demographic rates, it is difficult to interpret why abundance varies after logging, increasing at some sites and decreasing at others. Studies conducted on aquatic Coastal Giant Salamanders in the Chilliwack Valley have yielded inconsistent results (Ferguson 1998; Richardson and Neill 1998; Hatziantoniou 1999; W.E. Neill, unpubl. data).

Radio-telemetry studies of Coastal Giant Salamanders in Chilliwack and northwestern Washington suggest that the terrestrial phase of this species may be adversely affected by logging (Johnston 1998; Johnston and Frid 2003). Catch per unit effort was lower in clearcut habitat than in

forested habitat, and salamanders in clearcuts altered their behaviour in ways consistent with a water stress hypothesis. In comparison with salamanders at forested sites, animals in clearcuts remained closer to the stream, spent more time in subterranean refuges, had a more restricted range, and were more dependent on precipitation for their movement during the driest field season. These changes in behaviour could reduce the fitness of animals in clearcuts by influencing their ability to find food and mates (Johnston 1998). These findings are consistent with results of a study in Oregon, where Vesely (1996) found terrestrial Coastal Giant Salamanders at fewer logged sites (1 of 13 sites, 7%) than sites with forest cover (5 of 12 sites with riparian buffer strips, 42%).

Curtis and Taylor (2003) also found that Coastal Giant Salamander populations at eight sample streams found had lower levels of genetic variation and heterozygosity in recent clearcut sites than in second-growth or old-forest sites. These results suggest that clearcut logging is associated with low population densities or population bottlenecks.

Logging roads constructed to gain access to timber may act as dispersal barriers to aquatic Coastal Giant Salamanders. Culverts are installed to enable uninterrupted stream flow below the roads. Most culverts, however, extend beyond the road edge, creating a considerable drop to the stream below (>1 m in many instances). Waterfalls created by the culverts likely prevent upstream movements of aquatic salamanders and the effect of the downstream drop is not known.

Farr (1989) cited housing development on the north side of Vedder Mountain as a potential threat to Coastal Giant Salamanders. Urbanization continues throughout the Chilliwack Valley, including in the Vedder Mountain area. The population of the City of Chilliwack has nearly doubled in the past 10 years, and the growth rate is expected to increase as the Vancouver metropolitan area extends up the Fraser Valley. With 20% of the region's population living in rural areas, housing developments are encroaching up mountainsides and into Coastal Giant Salamander habitat.

Legal Protection and Habitat Conservation

The Coastal Giant Salamander is protected in that it cannot be killed, collected, or held in captivity without a permit, under the provincial *Wildlife Act*. In areas where salmonid habitat exists downstream, some protection may be provided by the *Canadian Fisheries Act*.

Some areas of the Chilliwack River Valley receive some level of protection as parks, recreation areas, and ecological reserves. Coastal Giant Salamanders have been detected within Chilliwack Lake Provincial Park (9122 ha). This park is contiguous with a large park (North Cascades National Park) in Washington State. There are anecdotal observations for Cultus Lake Provincial Park (656 ha), Chilliwack River Provincial Park, and Liumchen Ecological Reserve (948 ha). Numbers present are not known (M. Turner, pers. comm.).

The vast majority of this species' habitat falls on Crown land managed for forestry. The results based code may ensure habitat protection through the establishment of old growth management areas, provided these areas overlap sites inhabited by Coastal Giant Salamanders. Habitat is also protected by riparian management recommendations that recommend reserve zones along S1–S3 streams. As is the case with the *Fisheries Act*, however, this does not afford significant habitat protection because Coastal Giant Salamanders rarely occur in fish-bearing streams. Most of this species' habitat falls along small headwater streams (S5 and S6). Riparian management recommendations also recommend that forest practices in management zones adjacent to these streams be planned and implemented to meet riparian objectives such as wildlife, channel stability, and downstream water quality.

Protected areas or special resource management zones created for other species with overlapping ranges with the Coastal Giant Salamander (e.g., Spotted Owl, Pacific Water Shrew, tall bugbane) may afford additional protection.

Identified Wildlife Provisions

Sustainable resource management and planning recommendations

- ❖ Establish old growth management areas to protect suitable riparian habitats (i.e., small streams within range of species) or increase forest retention on small streams (i.e., S4–S6) and on stream reaches adjacent to Coastal Giant Salamander WHAs.
- ❖ Maximize connectivity of riparian areas.
- ❖ Maintain stream flow characteristics and water quality.
- ❖ Fall and yard away from stream channels and minimize site disturbance during harvesting to reduce risks of water diversion and stream sedimentation.
- ❖ Minimize the use of chemical applications within suitable Coastal Giant Salamander habitat.

Wildlife habitat area

Goal

Maintain and link important aquatic and riparian habitats not addressed through strategic or landscape level planning.

Feature

Establish WHAs at streams characterized by (1) presence of Coastal Giant Salamander larvae, (2) year-round flow, (3) small size (<5 m channel width), (4) intermediate gradient, (5) step-pool morphology, (6) stable channel beds, and (7) forest cover. In choosing WHA sites, priority should be given to sites that have the highest density of larvae and low levels of historical harvest, and that are adjacent to mature or old forest, closest to the headwaters, and free of fish.

Size

Typically between 20 and 100 ha depending on site-specific factors such as the number and length of streams included and whether overland connectivity is required.

Design

Wherever possible, include more than one stream or stream reach that contains Coastal Giant Salamanders within the WHA. A 30 m core area and 20 m management zone should be maintained on either side of all stream reaches with the WHA. When a WHA contains upland areas needed to connect adjacent stream reaches, include the upland area as part of the management zone. Maximize connectivity of streams and consider overland dispersal requirements of terrestrial adults in the design of the WHA.

General wildlife measures

Goals

1. Preserve the structure, flow regime, water quality and temperature of within-stream habitat.
2. Maintain microclimatic conditions in adjacent forest areas.
3. Maintain important habitat features such as cover objects (e.g., coarse woody debris), clear cold water, ample food supply, understory vegetation, and subterranean channels.
4. Maintain connectivity between streams.

Measures

Access

- Do not construct roads or crossings. Approved roads should be constructed with minimum road bed and right-of-way widths, and whenever possible, downslope of WHAs. If constructed upslope, implement sediment-control measures and prevent water diversion.
- Approved crossings should use open-bottom structures (i.e., bridges or open-bottom culverts).
- When no longer in use, roads should be deactivated using methods that minimize the risk of water diversion and stream sedimentation.

Harvesting and silviculture

- Do not harvest in the core area.
- Within all riparian areas in the management zone, use partial harvesting systems that maintain 70% basal area, ensure windfirmness, and maintain forest structure and cover by retention of multi-layered canopy and snags. Within all upland areas within the management

zone, ensure harvesting maintains shade, microclimatic conditions, coarse woody debris, and ground structure (i.e., small mammal burrows, root channels) to facilitate dispersal between streams.

- Do not salvage timber.
- Fall and yard away from streams.
- Remove slash and debris that inadvertently enters the stream (unless this will destabilize the bank or channel).
- Use silviculture strategies and equipment that minimize ground disturbance.
- Retain wildlife trees, non-merchantable conifer trees, understory deciduous trees, shrubs, herbaceous vegetation, and coarse woody debris.
- Avoid burning.

Pesticides

- Do not use pesticides.

Recreation

- Do not establish recreation sites.

Additional Management Considerations

Manage stream reaches adjacent to WHAs according to the best management practices outlined in the *Riparian Management Area Guidebook*.

At S5 and S6 streams containing Coastal Giant Salamanders, retain riparian vegetation to provide stream shading.

Minimize debris entering the stream channel from logging operations.

To maintain coarse woody debris, avoid piling or burning residue (leave it well distributed across the stand) and retain non-merchantable material on site.

Recommendations for urban and rural land development are available from the MWLAP lower mainland office.

Avoid introducing fish into waters supporting Coastal Giant Salamanders.

Information Needs

1. Demographic responses of Coastal Giant Salamanders to habitat change (i.e., reproductive success, age-class distribution).
2. Movement and dispersal patterns of juvenile (recently transformed from aquatic to terrestrial phase) Coastal Giant Salamanders.
3. Population trends (long-term monitoring at established sites in the Chilliwack Valley).

Cross References

Coastal Tailed Frog, Keen's Long-eared Myotis, Pacific Water Shrew, Red-legged Frog, Short-eared Owl, Spotted Owl, tall bugbane

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Appendix 2b

Wildlife: Grizzly Bear

ORDER – Wildlife Habitat Areas
2-097, 2-098, 2-105 to 2-107, 2-111, 2-113, 2-116, and 2-372 to 2-380
Grizzly Bear – Chilliwack Forest District

This order is given under the authority of sections 9(2)[§] and 10(1) of the *Government Actions Regulation* (B.C. Reg. 582/2004) (GAR).

1. The Deputy Minister of Environment, being satisfied that
 - i. the following area contains habitat that is necessary to meet the habitat requirements for Grizzly Bear (*Ursus arctos*);
orders that
 - a) the areas shown in the map set out in the attached Schedule As (2-097 to 2-098, 2-372, 2-374 to 2-377, 2-379; 2-105 to 2-107, 2-111, 2-113, 2-116, 2-380; 2-373 and 2-378) and contained in the wildlife habitat area (WHA) spatial layer stored in the Geographic Warehouse (WHSE_WILDLIFE_MANAGEMENT.WCP_WILDLIFE_HABITAT_AREA_POLY) are established as wildlife habitat areas 2-097, 2-098, 2-105 to 2-107, 2-111, 2-113, 2-116, and 2-372 to 2-380 for Grizzly Bear. The centre point of the line on the attached Schedule As is what establishes the WHA boundary; and
 - b) if there is a discrepancy between the areas shown in the map set out in the attached Schedule As and the WHA spatial layer stored in the Geographic Warehouse (*twha_bc*), the areas as detailed in the WHA spatial layer will take precedent; and
2. The Deputy Minister of Environment, being satisfied that
 - i. the general wildlife measures (GWMs) described below are necessary to protect or conserve the habitat of Grizzly Bear ; and
 - ii. GAR or another enactment does not otherwise provide for that protection or conservation;
orders that
 - a) the GWMs outlined in Schedule 1 are established for WHAs 2-097, 2-098, 2-105 to 2-107, 2-111, 2-113, 2-116, and 2-372 to 2-380.
3. The general wildlife measures outlined in Schedule 1 do not apply for the purposes of exploration, development and production activities when these activities have been authorized for the purpose of subsurface resource exploration, development or production by the Mineral Tenure Act, the Coal Act, the Mines Act, the Petroleum and Natural Gas Act, the Pipeline Act or the Geothermal Resources Act.

Definitions

Words and expressions not defined in this order have the meaning given to them in the *Forest and Range Practices Act* (FRPA) and the regulations made under it, unless context indicates otherwise.

incursion means timber harvesting or road construction that is located within a wildlife habitat area boundary where no harvesting or road building is otherwise permitted to occur.

productive forest area means forest included as either contributing, partial contributing or non-contributing as per Timber Supply Review 2 planning

regional manager means the Ministry of Environment Regional Manager Environmental Stewardship, South Coast

traditional and cultural activities is as defined in the *Free Use Permit Regulation*.

Schedule 1 – General Wildlife Measures:

Access, harvesting and silviculture

1. Do not harvest timber or construct roads in the WHA.
2. Provided the Regional Manager is notified prior to commencement of activities, GWM 1 does not apply if:
 - a. future temporary road reconstruction is required through WHA 2-373 to access timber beyond the WHA;
 - b. future temporary road construction is required through WHA 2-111 to access timber outside the WHA;
 - c. future temporary road reconstruction of approximately 200m of Branch 11 of the Spuzzum FSR is required through the easternmost boundary of WHA 2-376 to access timber beyond the WHA;
 - d. future temporary road reconstruction of approximately 300m of the South Emory road is required through the westernmost south finger of WHA 2-377; or
 - e. aerial harvesting of BCTS cut-block "A56234 (ABCDF)" is required in WHA 2-116.
3. GWM 1 does not apply if:
 - a) timber harvesting within the WHA is necessary to create guyline tiebacks for timber harvesting provided trees that fall within the WHA boundary are retained on site to function as coarse woody debris; or
 - b) cutting of trees is for the purposes of traditional and cultural activities, as authorized under a Free Use Permit.

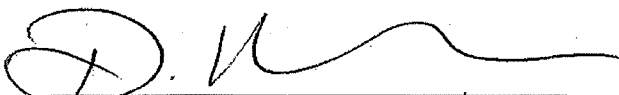
4. Where timber harvesting or road construction are planned immediately adjacent to any WHA with >30 ha productive forest area, GWM 1 or GWM 3 do not apply to the area of an incursion along the WHA boundary if:
- a. the incursion is required to provide for a logical harvesting boundary or a logical road or trail location that utilizes a physical feature or administrative boundary;
 - b. the area of the incursion, or multiple incursions cumulatively, do not exceed:
 - i. 1 ha of productive forest area in WHAs with >30 ha and ≤50 ha productive forest area; or
 - ii. 2 ha of productive forest area in WHAs with >50 ha to ≤100 ha productive forest area; or
 - iii. 3 ha or 1% of productive forest area, whichever is greater, in WHAs with >100 ha productive forest area;
 - c. the incursion exceeds 0.5 ha, and the area of the incursion is replaced with an equivalent or greater area of equal or better habitat contiguous to the WHA such that there is no net loss; and the incursion does not affect the intent or integrity of the WHA; and
 - d. the incursion as per GWM 4 a) or b), and any replacement habitat as per GWM 4 c) are provided to the Regional Manager (via ESRI shapefiles) prior to the commencement of primary forest activities associated with the incursion.

Pesticides

5. Do not use pesticides within the WHA, except for:
- a) the use of *Bacillus thuringiensis* var *kurstaki* for the control of western spruce budworm;
 - b) the use of beetle pheromones for the control of bark beetles; and
 - c) the application of herbicides to control invasive plants or noxious weeds.

Recreation

6. Do not develop recreational structures, trails, or facilities.


Signed this 16 day of Sept, 2010
Doug Konkin, Deputy Minister
Ministry of Environment

Appendix 1:

The following information is provided by the Ministry of Environment (MoE) as background information and support to the order establishing WHAs 2-097, 2-098, 2-105 to 2-107, 2-111, 2-113, 2-116, and 2-372 to 2-380. This appendix is not part of the order.

1. Activities to which the order does not apply: Section 2(2) of the *Government Actions Regulation* states

An order under any of sections 5 to 15 does not apply in respect of

(a) any of the following entered into before the order takes effect:

(i) a cutting permit;

(ii) a road permit;

(iii) a timber sale licence that does not provide for cutting permits;

(iv) a forestry licence to cut issued by a timber sales manager under section 47.6 (3) of the *Forest Act*;

(v) subject to subsection (3), a minor tenure,

(b) a declared area,

(c) areas described in section 196 (1) of the Act, and

(d) areas referred to in section 110 of the *Forest Planning and Practices Regulation*.

2. Authority to consider an exemption from these GWMs is provided in Section 92(1) of the *Forest Planning and Practices Regulation* and section 79(1) of the *Woodlot License Planning and Practices Regulation*. An exemption may be provided if the Minister's delegate is satisfied that the intent of the GWM will be achieved or that compliance with the provision is not practicable, given the circumstances or conditions applicable to a particular area.

An exemption application should be submitted to the Minister's delegate (Regional Manager for the region in which the order applies) with a rationale describing the nature of the problem and options to integrate WHA conservation with proposed forest and/or range practices. This submission will assist in timely consideration of the matter, and will inform the conditions, if any, of the exemption that may be granted prior to commencement of activities. Upon receipt of a complete exemption application, a determination will normally be made within 14 calendar days of arrival. Incomplete packages will be returned to the proponent for resubmission. A template for exemption requests is available at: <http://www.env.gov.bc.ca/wld/frpa/index.html>

3. For GWM 1, exemptions would only normally be considered to restore or enhance degraded habitat, as determined by the Regional Manager, or for roads where there are no other practicable options.
4. GWM 1 does not apply to road maintenance, road deactivation or brushing within the right-of-way on existing roads or trails in the WHA, provided these activities are carried out in a manner that will not affect the intent or integrity of the WHA.

5. For GWM 2: If reconstruction of the temporary road through WHA 2-373 occurs in the future an access control measure (e.g. gate) at the start of the road should be installed to prevent public access; and if the temporary road through WHA 2-111 is reconstructed the tenure holder should make every effort to meet the objective for "*Habitat Effectiveness at the Landscape Scale*" in the approved *North Cascades Grizzly Bear Recovery Plan*.
6. The intent of GWM 4 is to facilitate pre-authorized boundary exemptions for those WHAs with >30 ha productive forest area. Examples of incursions include a cut-block, road, trail or landing that overlaps a WHA boundary and: a) that the intent of the WHA boundary was to follow a creek/road and in some areas the boundary extends slightly beyond the creek/road due to a GIS mapping error and creates the overlap; or b) unintentional overlap occurs with an engineered primary forest activity that becomes evident when comparing map scales (e.g. 1:20000 vs 1:5000 often at final design stage); or c) *Forest Act* agreement holders can demonstrate that the block, road, trail or landing are located in a logical location and the incursion does not exceed the amount allowed.

In almost all instances the amount of incursion is anticipated to affect a small area. No replacement area is required when the discrepancy is: a) caused by GIS boundary mapping error since the intent of the WHA has not been altered; or b) the cumulative overlap is <0.5 ha. In other situations, the intended result is that where a boundary amendment is suggested by a *Forest Act* agreement holder and when the reduction is measurable (≥ 0.5 and ≤ 3 ha or <1% measured cumulatively in any WHA), it will result in no net loss to habitat in the WHA. Delineation of equal or better Grizzly Bear habitat, in quantity and quality, will be required contiguous to the WHA. Any biological assessment to replace habitat should be conducted by a qualified professional with appropriate training and experience for the work being completed. If replacement habitat is required and equal or better habitat is not available contiguous to the WHA in question then the incursion cannot proceed under this GWM.

Boundary amendments meeting the conditions identified in GWM 4 will be periodically reviewed by MoE and the WHA boundary officially amended under the *Government Actions Regulation*. In any instances where the conditions in GWM 4 cannot be met, proposed primary forest activities will require an exemption as outlined under section 2 in this Appendix.

WHAs with <30 ha of productive forest area (i.e. WHA 2-374, 2-375, 2-378, 2-379), are excluded from GWM 4 (b)(i) because of potential adverse impacts to the small amount of security cover from an incursion. An exemption request for any incursions in these WHAs should be submitted to the Regional Manager, as per Appendix item #2 above.

It is acknowledged that there are no WHAs that fit GWM 4 (b)(i), however, this clause is retained to be consistent with other orders and the intent of this GWM.

In addition to reporting incursions to the Regional Manager prior to commencement of timber harvesting or road construction as per GWM 4 (d), it is the proponent's

responsibility to keep accurate records of each occurrence. Records must also be made available to a MoE or Ministry of Forests and Range official upon request.

7. Where roads in the WHA are temporary and no longer required, they should be permanently deactivated. Proponents must notify the Regional Manager when deactivation of temporary roads is complete.
8. Upon the approval of this order the Section 7 Notice for Grizzly Bear in the Chilliwack Forest District will be amended to provide the area and amount of THLB remaining for Grizzly Bear WHAs in the Chilliwack Forest District.



ORDER – Wildlife Habitat Areas # 2-099, 2-100, 2-101, 2-102, 2-194

The following order applies to the areas shown in the maps set out in the attached Schedules A and takes effect on the 17 day of MAR, 2005.


This order is given under the authority of sections 9(2) and 10(1) of the *Government Actions Regulation* (B.C. Reg. 582/04) and section 7(3) of the *Forest Planning and Practices Regulation* (B.C. Reg. 14/04).

The Deputy Minister of Water, Land and Air Protection orders that:

1. the wildlife habitat areas shown in the maps set out in the attached Schedules A (# 2-099, 2-100, 2-101, 2-102, 2-194) are established;
2. the wildlife habitat areas in the attached Schedules A are established for Grizzly bear (*Ursus arctos*);
3. the general wildlife measures outlined in Schedule 1 are established for the wildlife habitat areas in the attached Schedules A; and
4. pursuant to section 7(3) of the *Forest Planning and Practices Regulation* the person(s) required to prepare a forest stewardship plan are hereby exempted from the obligation to prepare results or strategies in relation to the objective set out in section 7(1) of the *Forest Planning and Practices Regulation* to the extent that wildlife habitat areas ~~2-097, 2-098~~, 2-099, 2-100, 2-101, 2-102, 2-194 addresses the amount included for Grizzly bear in the Notice for the Chilliwack Forest District.

Schedule 1 – General Wildlife Measures

1. *Access* – do not construct roads, trails, or landings unless an exemption is approved by the MWLAP Delegated Decision Maker.
2. *Harvesting and Silviculture* – no forestry practices should be carried out within the WHA unless an exemption is approved by the MWLAP Delegated Decision Maker. Activities should on be only to restore or enhance degraded habitat or to ensure windfirmness.
3. *Pesticides* – do not use pesticides unless an exemption is approved by the MWLAP Delegated Decision Maker.
4. *Range* – plan livestock grazing to maintain forage value for Grizzly Bears and minimize the potential for conflicts. Do not place livestock attractants within WHA. Incorporate management strategies in the range use plan to reduce contact and competition between livestock and Grizzly Bears. Consider salt placement, alternate water development, drift fencing, or altering periods of livestock use.


Signed this 17 day of MAR, 2005
Gordon Macatee, Deputy Minister
Ministry of Water, Land and Air Protection



ORDER – Wildlife Habitat Areas # 2-109, 2-112, 2-114, 2-118, 2-119, 2-195, 2-196, 2-197, 2-198, 2-199, 2-201, 2-202, 2-203

The following order applies to the areas shown in the maps set out in the attached Schedules A and takes effect on the 17 day of MAR, 2005.

This order is given under the authority of sections 9(2) and 10(1) of the *Government Actions Regulation* (B.C. Reg. 582/04) and section 7(3) of the *Forest Planning and Practices Regulation* (B.C. Reg. 14/04).

The Deputy Minister of Water, Land and Air Protection orders that:

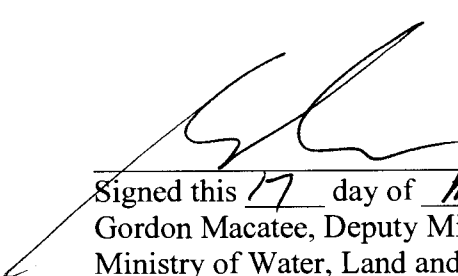
1. the wildlife habitat areas shown in the maps set out in the attached Schedules A (#2-109, 2-112, 2-114, 2-118, 2-119, 2-195, 2-196, 2-197, 2-198, 2-199, 2-201, 2-202, 2-203) are established;
2. the wildlife habitat areas in the attached Schedules A are established for Grizzly bear (*Ursus arctos*);
3. the general wildlife measures outlined in Schedule 1 are established for the wildlife habitat areas in the attached Schedules A; and
4. pursuant to section 7(3) of the *Forest Planning and Practices Regulation* the person(s) required to prepare a forest stewardship plan are hereby exempted from the obligation to prepare results or strategies in relation to the objective set out in section 7(1) of the *Forest Planning and Practices Regulation* to the extent that wildlife habitat areas 2-109, 2-112, 2-114, 2-118, 2-119, 2-195, 2-196, 2-197, 2-198, 2-199, 2-201, 2-202, 2-203 addresses the amount included for Grizzly bear in the Notice for the Chilliwack Forest District.

Schedule 1 – General Wildlife Measures

1. *Access*
 - Do not construct roads, trails, or landings unless an exemption is approved by the MWLAP Delegated Decision Maker.
 - **An exemption to allow road construction through WHA 2-199 will be accommodated to address any overlap with engineered road right-of-way upon receipt of engineered road layout and design maps. The forest tenure holder must be aware that this immediate area is seasonally important habitat for grizzly bears in the threatened North Cascades grizzly bear population unit and road access management is a concern. The tenure holder will make every effort to meet the objective for “Habitat Effectiveness at the Landscape Scale” in the approved North Cascades Grizzly Bear Recovery Plan.**
2. *Harvesting and Silviculture*
 - No forestry practices should be carried out within the WHA unless an exemption is approved by the MWLAP Delegated Decision Maker. Activities should only be only to restore or enhance degraded habitat or to ensure windfirmness.
3. *Pesticides*
 - Do not use pesticides unless an exemption is approved by the MWLAP Delegated Decision Maker.

4. *Range*

- Plan livestock grazing to maintain forage value for Grizzly Bears and minimize the potential for conflicts. Do not place livestock attractants within WHA. Incorporate management strategies in the range use plan to reduce contact and competition between livestock and Grizzly Bears. Consider salt placement, alternate water development, drift fencing, or altering periods of livestock use.



Signed this 17 day of MAR, 2005
Gordon Macatee, Deputy Minister
Ministry of Water, Land and Air Protection

ORDER – WILDLIFE HABITAT AREAS
2-407 to 2-434
Grizzly Bear – Chilliwack Forest District

This order is given under the authority of sections 9(2) and 10(1) of the *Government Actions Regulation* (B.C. Reg. 582/2004) (GAR).

1. The Deputy Minister of Natural Resource Operations, being satisfied that
 - i. the following area contains habitat that is necessary to meet the habitat requirements for Grizzly Bear (*Ursus arctos*);orders that
 - a) the areas shown in the map set out in the attached Schedule A (2-407 to 2-434) and contained in the wildlife habitat area (WHA) spatial layer stored in the Geographic Warehouse (WHSE_WILDLIFE_MANAGEMENT.WCP_WILDLIFE_HABITAT_AREA_POLY) are established as wildlife habitat areas 2-407 to 2-434 for Grizzly Bear. The centre point of the line on the attached Schedule A is what establishes the WHA boundary;
 - b) if there is a discrepancy between the areas shown in the map set out in the attached Schedule A and the WHA spatial layer stored in the Geographic Warehouse (WHSE_WILDLIFE_MANAGEMENT.WCP_WILDLIFE_HABITAT_AREA_POLY), the areas as detailed in the WHA spatial layer will take precedent; and
 - c) pursuant to section 7(3) of the *Forest Planning and Practices Regulation* the person(s) required to prepare a forest stewardship plan are hereby exempted from the obligation to prepare results or strategies in relation to the objective set out in section 7(1) of the *Forest Planning and Practices Regulation* for Grizzly Bear in the Chilliwack Forest District.

2. The Deputy Minister of Natural Resource Operations, being satisfied that
 - i. the general wildlife measures (GWMs) described below are necessary to protect and conserve the habitat of Grizzly Bear; and
 - ii. GAR or another enactment does not otherwise provide for that protection or conservation;orders that
 - a) the GWMs outlined in Schedule 1 are established for WHAs 2-407 to 2-434.

3. The general wildlife measures outlined in Schedule 1 do not apply for the purposes of exploration, development and production activities when these activities have been authorized for the purpose of subsurface resource exploration, development or production by the *Mineral Tenure Act*, the *Coal Act*, or the *Geothermal Resources Act*.

Definitions:

Words and expressions not defined in this order have the meaning given to them in the *Forest and Range Practices Act* (FRPA) and the regulations made under it, unless context indicates otherwise.

incursion means new timber harvesting or road construction that is located within a wildlife habitat area boundary where no harvesting or road building is otherwise permitted to occur.

productive forest area means forest included as either contributing, partial contributing or non-contributing as per Timber Supply Review 2 planning

director means the Director, Resource Management, South Coast Region of the Ministry of Natural Resource Operations

traditional and cultural activities is as defined in the *Free Use Permit Regulation*.

Schedule 1 – General Wildlife Measures:*Access, harvesting and silviculture*

1. Do not harvest timber or construct roads in the WHA.
2. Provided the Director is notified prior to the commencement of activities, GWM 1 does not apply if future road reconstruction and road extension is required through WHA 2-429 to access timber beyond the WHA.
3. GWM 1 does not apply if:
 - a) timber harvesting within the WHA is necessary to create guyline tiebacks for timber harvesting associated with landings/cutblocks adjacent to the WHA boundary, provided trees that fall within the WHA boundary are retained on-site to function as coarse woody debris; or
 - b) cutting of trees is for the purposes of traditional and cultural activities, as authorized under a Free Use Permit.
4. Where timber harvesting or road construction are planned immediately adjacent to any WHA with >30 ha productive forest area, GWM 1 does not apply to the area of an incursion along the WHA boundary if:
 - a) the incursion is required to provide for a logical harvesting boundary or a logical road or trail location that utilizes a physical feature or administrative boundary;
 - b) the area of the incursion, or multiple incursions cumulatively, do not exceed:
 - i. 1 ha of productive forest area in WHAs with >30 ha and ≤50 ha productive forest area; or

- ii. 2 ha of productive forest area in WHAs with >50 ha to ≤100 ha productive forest area; or
 - iii. 3 ha or 1% of productive forest area, whichever is greater, in WHAs with >100 ha productive forest area;
- c) the incursion exceeds 0.5 ha, and the area of the incursion is replaced with an equivalent or greater area of equal or better habitat contiguous to the WHA such that there is no net loss; and the incursion does not affect the intent or integrity of the WHA; and
 - d) the incursion as per GWM 4 a) or b), and any replacement habitat as per GWM 4 c) are provided to the Director (via ESRI shape files) prior to the commencement of primary forest activities associated with the incursion.

Pesticides

- 5. Do not use pesticides in the WHA, except for:
 - a) the use of *Bacillus thuringiensis* var *kurstaki* for the control of western spruce budworm;
 - b) the use of beetle pheromones for the control of bark beetles; and
 - c) the application of herbicides to control invasive plants or noxious weeds.

Recreation

- 6. Do not develop recreational structures, trails, or facilities.



Signed this 8 day of March, 2011
Doug Konkin, Deputy Minister
Ministry of Natural Resource Operations

Appendix 1:

The following information is provided by the Ministry of Natural Resource Operations and Ministry of Environment (MoE) as background information and support to the order establishing WHAs 2-407 to 2-434. This appendix is not part of the order.

1. **Activities to which the order does not apply:** Section 2(2) of the *Government Actions Regulation* states

An order under any of sections 5 to 15 does not apply in respect of

(a) any of the following entered into before the order takes effect:

(i) a cutting permit;

(ii) a road permit;

(iii) a timber sale licence that does not provide for cutting permits;

(iv) a forestry licence to cut issued by a timber sales manager under section 47.6 (3) of the *Forest Act*;

(v) subject to subsection (3), a minor tenure,

(b) a declared area,

(c) areas described in section 196 (1) of the Act, and

(d) areas referred to in section 110 of the *Forest Planning and Practices Regulation* (FPPR).

2. Authority to consider an exemption from these GWMs is provided in section 92(1) of the FPPR, and section 79(1) of the *Woodlot License Planning and Practices Regulation*. An exemption may be provided if the Minister's delegate is satisfied that the intent of the GWM will be achieved or that compliance with the provision is not practicable, given the circumstances or conditions applicable to a particular area.

An exemption application should be submitted to the Minister's delegate with a rationale describing the nature of the problem and options to integrate WHA conservation with proposed forest and/or range practices. This submission will assist in timely consideration of the matter, and will inform the conditions, if any, of the exemption that may be granted prior to commencement of activities. Upon receipt of a complete exemption application, a determination will normally be made within 14 calendar days of arrival. Incomplete packages will be returned to the proponent for re-submission. A template for exemption requests is available at:

<http://www.env.gov.bc.ca/wld/frpa/index.html>

3. For GWM 1, exemptions would only normally be considered to restore or enhance degraded habitat, as determined by the Director, or for roads or trails where there are no other practicable options.
4. GWM 1 does not apply to road maintenance, road deactivation or brushing within the right-of-way on existing roads or trails in the WHA, provided these activities are carried out in a manner that will not affect the intent or integrity of the WHA.
5. The intent of GWM 4 is to facilitate pre-authorized boundary exemptions for those WHAs with >30 ha productive forest area provided that MOE is notified prior to the incursion taking place. Examples of incursions include a cut-block, road, trail or landing that overlaps a WHA boundary

and: a) that the intent of the WHA boundary was to follow a creek/road and in some areas the boundary extends slightly beyond the creek/road due to a GIS mapping error and creates the overlap; or b) unintentional overlap occurs with an engineered primary forest activity that becomes evident when comparing map scales (e.g. 1:20000 vs 1:5000 often at final design stage); or c) *Forest Act* agreement holders can demonstrate that the block, road, trail or landing are located in a logical location and the incursion does not exceed the amount allowed.

In almost all instances the amount of incursion is anticipated to affect a small area. No replacement area is required when the discrepancy is: a) caused by GIS boundary mapping error since the intent of the WHA has not been altered; or b) the cumulative overlap is <0.5 ha. In other situations, the intended result is that where a boundary amendment is suggested by a *Forest Act* agreement holder and when the reduction is measurable (≥ 0.5 and ≤ 3 ha or <1% measured cumulatively in any WHA), it will result in no net loss to habitat in the WHA. Delineation of equal or better grizzly bear habitat, in quantity and quality, will be required contiguous to the WHA. Any biological assessment to replace habitat should be conducted by a qualified professional with appropriate training and experience for the work being completed. If replacement habitat is required and equal or better habitat is not available contiguous to the WHA in question then the incursion cannot proceed under this GWM.

Boundary amendments meeting the conditions identified in GWM 4 will be periodically reviewed by MoE and the WHA boundary officially amended under the *Government Actions Regulation*. In any instances where the conditions in GWM 4 cannot be met, proposed primary forest activities will require an exemption as outlined under section 2 in this Appendix.

WHAs with <30 ha of productive forest area (i.e. WHA 2-410, 2-411, 2-414, 2-418, 2-421, 2-425, 2-430), are excluded from GWM 4 (b)(i) because of potential adverse impacts to the small amount of security cover from an incursion. An exemption request for any incursions in these WHAs should be submitted to the Regional Manager, as outlined under section 2 in this Appendix.

In addition to reporting incursions to the Director prior to commencement of timber harvesting or road construction as per GWM 4 (d), it is the proponent's responsibility to keep accurate records of each occurrence. Records must also be made available to a MoE, Ministry of Forests, Mines & Lands or Ministry of Natural Resource Operations official upon request.

6. Where roads in the WHA are temporary and no longer required, they should be permanently deactivated. Proponents must notify the Director when deactivation of temporary roads is complete.
7. When reforesting areas within the WHA reduced stocking standards should be used as outlined in the document titled: *Grizzly Bear Habitat in Managed Forests - Silviculture Treatments to Meet Habitat and Timber Objectives*.
8. These GWMs do not apply to persons who must comply with the *Worker's Compensation Act* and the regulations under that Act (e.g. danger tree felling).

GRIZZLY BEAR

Ursus arctos

*Original prepared by Les Gyug,
Tony Hamilton, and Matt Austin*

Species Information

Taxonomy

The Grizzly Bear, *Ursus arctos*, is one of eight species of the bear family, Ursidae. There are currently two recognized North American subspecies: *U. arctos horribilis*, the common subspecies, and *U. arctos middendorffi*, the Kodiak bear, found on a few Alaskan coastal islands.

Description

Bears are different from other carnivores by their greatly enlarged molar teeth with surfaces that have lost their shearing function and are adapted to crushing, in keeping with their omnivorous diets. The forelimbs are strongly built and the feet are plantigrade and have five toes. Forefeet have long, non-retractile claws. The ears are small and the tail is extremely short.

The Grizzly Bear is the second largest member of the bear family next only to the polar bear (*U. maritimus*). Grizzlies are large, heavy-bodied bears that can attain weights of up to 500 kg (average range 270–360 kg). Exceptionally large bears have been recorded at 680 kg. Adult grizzlies reach nose-to-tail lengths of 1.8 m on average but have been recorded as long as 2.7 m. The long, outer guard hairs of the Grizzly Bear are often tipped with white, silver, or cream giving the bear a grizzled appearance. Coat colour is quite variable, usually brown but ranging from black to almost white. Coat colour is not a good characteristic for distinguishing between Grizzly Bears and Black Bears (*Ursus americanus*). Grizzly Bear facial profiles are usually “dished-in” and a hump of muscle is normally present on the shoulders. The front claws on a

Grizzly Bear are longer than on Black Bears, being as long as 10 cm. The long front claws and hump of muscle on the shoulders are adaptations for digging.

Distribution

Global

The Grizzly Bear has a circumpolar distribution once covering most of North America, Europe, and the northern part of Asia. In many of these areas it has been exterminated or its numbers have been greatly reduced. Most of the world’s Grizzly Bears now occur in northwestern North America and Russia.

In North America, Grizzly Bears once ranged over most of the west, from Alaska south to Mexico, and from the Pacific coast east to Manitoba, and the Missouri River (Banci 1991). In the wake of westward development and settlement, especially in the plains, the range of the grizzly shrank to its present distribution of Alaska, the Yukon Territory, and British Columbia, with small populations in Alberta, the Northwest Territories, Montana, Idaho, and Wyoming.

British Columbia

Grizzly Bears historically occurred throughout British Columbia, with the exception of some coastal islands (e.g., Vancouver Island, Queen Charlotte Islands, and others). Populations are considered extirpated from much of south and southcentral British Columbia (e.g., lower elevations of the Okanagan, the Lower Mainland, and parts of the Cariboo). However, Grizzly Bear are occasionally sighted in the southern interior plateaus and other areas from which their populations are considered effectively extirpated.

Forest regions and districts

Grizzly Bears occur in all forest regions and almost all forest districts **except** South Island, and Queen Charlotte Islands, and only in the mainland portions of the Campbell River and North Island forest districts.

Ecoprovinces and ecosections

Grizzly Bears occur in most ecoprovinces and ecosections in mainland British Columbia but are absent from Vancouver Island and Queen Charlotte Islands. The following are mainland ecosections within which Grizzly Bear populations are considered **extirpated**:

BOP: PEL, and parts of CLH, HAP, KIP

CEI: CAB, FRB, and parts of CAP, CHP, NAU, QUL

COM: NWC, and parts of EPR, SPR

GED: GEL, FRL

SOI: SOB, SOH, NOB, THB and parts of NOH, NTU, OKR, PAR, STU

Biogeoclimatic units

Grizzly Bears occur in all biogeoclimatic units except BG and CDF.

Broad ecosystem units

Grizzly Bears are wide ranging, and can occur in most broad ecosystem units.

Elevation

All elevations from sea level estuaries to high alpine meadows and talus slopes.

Life History

Diet and foraging behaviour

In British Columbia, Grizzly Bears are efficient predators and scavengers but rely more on a vegetative diet. Grizzly Bears consume a wide variety of foods, including roots and green vegetation, small and large mammals, fish, and insects. A huge variety of plant, animal, fish, and insect food sources are regionally important. Grizzly Bears are omnivorous and opportunistic in their feeding habitats. Habitat

selection is governed by forage availability during the growing season. Grizzly Bear diet also changes with the seasons to make use of the most digestible foods. For example, Grizzly Bears will take advantage of palatable early spring forage. Feeding on ungulates is important during early spring, and for many bears, salmon comprises a significant fall diet item.

In general, the largest differences in the feeding patterns are between coastal and interior Grizzly Bears. On the coast (MacHutchon et al. 1993; Hamilton 1987), beginning in the spring, Grizzly Bears feed on early green vegetation such as skunk cabbage (*Lysichiton americanus*) and sedges located in the estuaries and seepage sites that become snow-free first. As the season advances, the bears follow the receding snow up the avalanche chutes feeding on emerging vegetation and roots. Ripe berries attract the grizzlies down onto the floodplain and lower slopes where they eat devil's-club (*Oplopanax horridus*), salmonberry (*Rubus spectabilis*), raspberry (*Rubus* spp.), black twinberry (*Lonicera involucreta*), elderberry (*Sambucus* spp.), and a variety of blueberries (*Vaccinium* spp.). They begin to feed on salmon (*Oncorhynchus* spp.) as they become available in the spawning channels and continue to do so until late fall, feeding on live and eventually dead salmon. Once salmon supplies dwindle, grizzlies return to feeding on skunk cabbage and other vegetation. Grizzlies will feed on insects and grubs when the opportunity arises, as well as molluscs and other animals of the intertidal zone.

In the interior (Simpson 1987; McLellan and Hovey 1995; Ciarniello et al. 2001) beginning in the spring, grizzlies feed mainly on the roots of *Hedysarum* spp., spring beauty (*Claytonia lacneolata*), and/or avalanche lily (*Erythronium grandiflorum*) depending on local abundance, and on carrion. They may also opportunistically prey on winter-weakened ungulates. As the green vegetation emerges the bears begin to graze on grasses, horsetails, rushes, and sedges. During this time, they also prey on ungulates on their calving grounds. In summer, bears follow the green-up to obtain nutritious young spring growth including locally important food sources such as cow-parsnip (*Heracleum* spp.). They also

obtain early ripening fruits beginning in mid-July mainly in riparian forests and productive low elevation seral forests, such as pine-soopolallie terraces. In late-summer and fall (August–October) high elevation berries become the major food source, mainly soopolallie (*Shepherdia canadensis*), blueberries, and huckleberries. Late fall feeding focuses mainly on harder berries such as mountain ash (*Sorbus* spp.) or kinnickinnick (*Arctostaphylos uva-ursi*) that persist past the *Vaccinium* fruiting season, and on the roots of *Hedysarum* in areas where it occurs. Throughout the active season, interior grizzlies will prey on small mammals, especially ground squirrels (*Spermophilus* spp.) Fish, roots, pine nuts, or bulbs, and insects are important whenever they are available and sufficiently abundant. Army cutworm moths (Noctuidae) in high elevation alpine talus slopes and boulder fields may be locally important (White et al. 1998a).

Reproduction

Breeding occurs between the end of April and end of June. Cubs are born in the den between January and March. The average age of first reproduction for females in southeastern British Columbia is 6 years, the time period between litters is 2.7 years, and the mean number of cubs per litter is 2.3 (McLellan 1989a). In southern grizzly populations, cubs tend to stay with the mother for approximately 2.5 years. Females remain in estrus throughout the breeding season until mating occurs and do not ovulate again for at least 2 (usually 3 or 4) years after giving birth. Two offspring are generally born per litter, and young are born blind and without fur. They are weaned at 5 months of age but remain with the mother until at least their second spring (and usually until the third or fourth).

Site fidelity

Many telemetry studies have shown that Grizzly Bears are creatures of habit and will usually return to the same seasonal food sources and areas throughout their lifetimes. Foraging strategies are somewhat flexible; individuals adapt to annual variation in food supply and can learn to exploit newly available food sources. However, many of a

Grizzly Bear's movements, habitat selection, and foraging patterns are learned as a cub and are reinforced throughout their lives (20–30 yr). Home range fidelity may be strong as a result, especially for females.

Home range

Home range sizes are proportionate to food quality, quantity, and distribution. Generally Grizzly Bear home ranges in productive coastal habitats near salmon stream are smaller than ranges in interior mountains, which are again smaller than ranges in interior plateau habitats. For coastal British Columbia, average minimum single year home range size was 137 km² for males, and 52 km² for females (Khutzeymateen: MacHutchon et al. 1993). For wet interior mountains, average home range size was 187 km² for males and 103 km² for females (Parsnip: Ciarniello et al. 2001; Revelstoke: Simpson 1987). For drier interior mountains or plateau areas, average home range size was 804 km² for males and 222 km² for females (Parsnip: Ciarniello et al. 2001; Flathead: McLellan 1981; Jasper: Russell et al. 1979; Kananaskis: Wielgos 1986).

Grizzly Bears, except females with cubs, and sibling groups, are solitary for most of the year except during the mating season. Mothers, daughters, and even granddaughters tend to have overlapping home ranges, while male home ranges are large and overlap with several adult females (Bunnell and McCann 1993). Habitat use and food habits studies have shown that the areas occupied by male grizzlies (200–300 km²) are much larger than what would be required simply to obtain food. The smaller range sizes of females with young (100 km²), which have greater energy needs than males, may provide the best estimate of the minimum feeding habitat requirements of individual bears. The large range sizes of male Grizzly Bears are probably related more to breeding than to food availability, while females may use small ranges where they can improve security of the young while still obtaining adequate food. Social intolerance and security needs of young bears probably act to distribute grizzlies widely over the available range. In many areas, adult females may inhabit marginal ranges or disturbed areas, such as

road margins, where human activities exclude most larger males (McLellan and Shackleton 1988). The size of individual home ranges varies annually in response to variation in quality and abundance of food (Picton et al. 1985). Grizzly Bear habitat use is strongly influenced by intraspecific social interactions (e.g., male predation on cubs) and the presence and activities of people.

Movements and dispersal

Grizzly Bears have low dispersal capabilities relative to other carnivores (Weaver et al. 1996). This is especially true for subadult female Grizzly Bears, which usually establish their home range within or adjacent to the maternal range (e.g., McLellan and Hovey 2001). On average, male Grizzly Bears only dispersed 30 km from the ranges used as cubs with their mothers, and female Grizzly Bears only 10 km (McLellan and Hovey 2001). This inherent fidelity, particularly of female Grizzly Bears, to their maternal home ranges may reduce the rate of recolonization of areas where breeding populations have been depleted.

Habitat

Structural stage

In general terms, Grizzly Bear forage tends to be more abundant in non-forested sites, or sites with partial forest, or sites with many tree gaps in older forest. However, security habitat and day bedding areas (for heat relief, rain interception, or warmth) tend to be closed forest sites near higher quality foraging sites. Some types of forage (e.g., salmon in streams, ants in logs, ungulates) can be found within many structural stages and the forage is not necessarily tied to any particular structural stage. (Refer to Table 1 on following page.)

Important habitats and habitat elements

Denning

Denning sites are generally used from November through March and usually to mid-April in the northern areas of British Columbia. Hibernating habitats tend to be high elevation areas that are sloped, and have dry, stable soil conditions that remain

frozen during the winter (Bunnell and McCann 1993). Dens are usually on steep north-facing slopes, with soils suitable for digging and where vegetation will stabilize the roof of the den and snow will accumulate for insulation (Vroom et al. 1977). Wet or seepage areas and areas with shallow soils or many boulders are avoided. Bears seldom reuse an excavated den but will often come back to the same vicinity to dig their new den (Ciarniello et al. 2001).

On the coast, dens are often dug under large old trees. The tree's root mass creates a stable roof for the den. Coastal grizzlies may also use very large tree cavities much like coastal Black Bears.

Foraging

Grizzly Bears in British Columbia have such an enormous range of learned behavioural adaptations to diverse regional ecosystems that generalization about habitat requirements is difficult. Even within a region, individual bears may have vastly different approaches to meeting their requirements. Some bears, particularly males, adopt a highly mobile, seasonally "transient" strategy, whereas other bears are more "resident." Some bears rely more heavily on predation than others, and some use higher elevation annual home ranges as opposed to migrating to lower elevations on a seasonal basis.

Although meeting nutritional requirements is the primary factor in habitat choice, selection is also based on thermal cover (e.g., dens/bedding sites), security (e.g., females protecting cubs), or access to potential mates during the breeding season. Habitat selection is also strongly influenced by intra-specific (social) interactions and the presence and activities of people.

Grizzly Bear habitat requirements must be viewed at several spatial scales. Transients deliberately travel to specific landscapes in a sub-region on a seasonal basis. Both residents and transients select specific patches of habitat or complexes of habitats within landscapes. Within patches, they may only require specific food-producing microsites. Habitat requirements must also be viewed at various temporal scales; continually shifting seasonal food supplies, annual food variance (e.g., berry crop failure), and

Table 1. Forage values by structural stage

Stage	Value
1a	Forage value for army cutworm moths in alpine rockfields or intertidal marine molluscs in estuaries. Otherwise generally nil forage value except in the presence of human foods or garbage. Seasonal use of small mammals (marmots and ground squirrels).
1b	Forage value for army cutworm moths in alpine rockfields. Forage value for intertidal marine molluscs in estuaries. Otherwise generally nil forage value except in the presence of human foods or garbage.
2	Forage value can be very high on bulbs, corms, grasses, horsetails, and other herbs. These values can be found variously in wet meadows, marshes, avalanche slopes, or alpine/subalpine meadows.
3a	Forage value can be very high, particularly in recovering burned or clearcut sites where <i>Vaccinium</i> berries are abundant.
3b	Forage value can be very high, particularly in recovering burned or clearcut sites where <i>Vaccinium</i> berries are abundant. Forage value can be high in skunk cabbage swamps, which are usually a mixture of structural stages because the typical skunk cabbage swamp is often partially treed, and contains tall alder or willow shrubs as well. Similarly typical avalanche slopes are mixtures of herb, low shrub, and tall shrub stages, all of which can provide high forage values for Grizzly Bears.
4	Typical value of densely forested sites, which preclude most herb or shrub forage values, are as day bedding sites for security and heat relief in areas near other types of foraging sites. Forests that are not as densely forested may continue to support berry patches (soopolallie or <i>Vaccinium</i>) in forests beyond the open shrub stage.
5	Typical value of densely forested sites, which preclude most herb or shrub forage values, are as day bedding sites for security and heat relief in areas near other types of foraging sites. Forests that are not as densely forested may continue to support berry patches (soopolallie or <i>Vaccinium</i>) in forests beyond the open shrub stage.
6	Typical value of densely forested sites, which preclude most herb or shrub forage values, are as day bedding sites for security and heat relief in areas near other types of foraging sites. Forests that are not as densely forested may continue to support berry patches (soopolallie or <i>Vaccinium</i>) in forests beyond the open shrub stage.
7	Value of forest (beyond security and heat relief) will depend on amount of openings in forest. Forests that remain dense in stage 7 will have little value beyond that found in stages 4, 5, and 6. Forests that become patchy with numerous gaps or dying canopies may support various amounts of berries or herbs for foraging in the canopy gaps.

long-term influences on habitat quality such as fire suppression must all be considered. Concurrent attention must be given to meeting the spatial requirements of individuals within and across landscapes and examining population level habitat supply.

Conservation and Management

Status

Grizzly Bears are on the provincial *Blue List* in British Columbia. In Canada, Grizzly Bears are considered of *Special Concern* in British Columbia and *Extirpated* in part of Alberta, Saskatchewan, and Manitoba (COSEWIC 2002). (See Summary of ABI status in BC and adjacent jurisdictions at bottom of page.)

Trends

Population trends

The provincial population estimate from the B.C. Ministry of Water, Land and Air Protection for Grizzly Bears is estimated at a minimum of 13 800, which is ~50% of the Canadian Grizzly Bear population. Overall, the population in British Columbia currently appears stable, but local population declines have occurred in the past in many areas of the province. Grizzly Bears are considered threatened in 8% of their historic range in British Columbia and effectively extirpated in ~10% (Figure 1). Grizzly bear populations are believed to be increasing in some areas of the province.

Habitat trends

Habitat effectiveness for Grizzly Bears has decreased in British Columbia and can be expected to continue to decrease in British Columbia (MELP 1995b). Habitat effectiveness considers the habitat suitability of the area and further accounts for impacts such as habitat displacement and fragmentation that reduce the ability or willingness of Grizzly Bears to use the habitat. While some of this is due to direct loss to agriculture and settlement, increasing road access is now more important. Road access leads to direct mortality through increased human–bear conflicts, hunting, and poaching, and an avoidance of habitats near roads and areas heavily used by people for recreation, resource extraction, or other reasons.

Threats

Population threats

Historic reductions in Grizzly Bear populations were a result of extensive agricultural land conversion, extermination campaigns often related to livestock protection, and unrestricted killing (IGBC 1987). Today, the primary limiting factors for Grizzly Bears in the Canadian portion of their range appear to be human-caused mortality from a variety of factors, and habitat loss, alienation, and fragmentation (McLellan et al. 2000; Kansas 2002).

Currently, throughout the Grizzly Bear’s range in North America, sources of area-concentrated mortality include hunting, poaching, and control kills associated with inadequate garbage management or other types of human-bear encounters including protection of livestock or perceived threats to human safety (IGBC 1987). In southern British Columbia,

Summary of ABI status in BC and adjacent jurisdictions (NatureServe Explorer 2002)

AB	AK	BC	ID	MT	YK	NWT	WA	Canada	Global
S3	S?	S3	S1	S1S2	S?	S?	S1	N3	G4T3T4

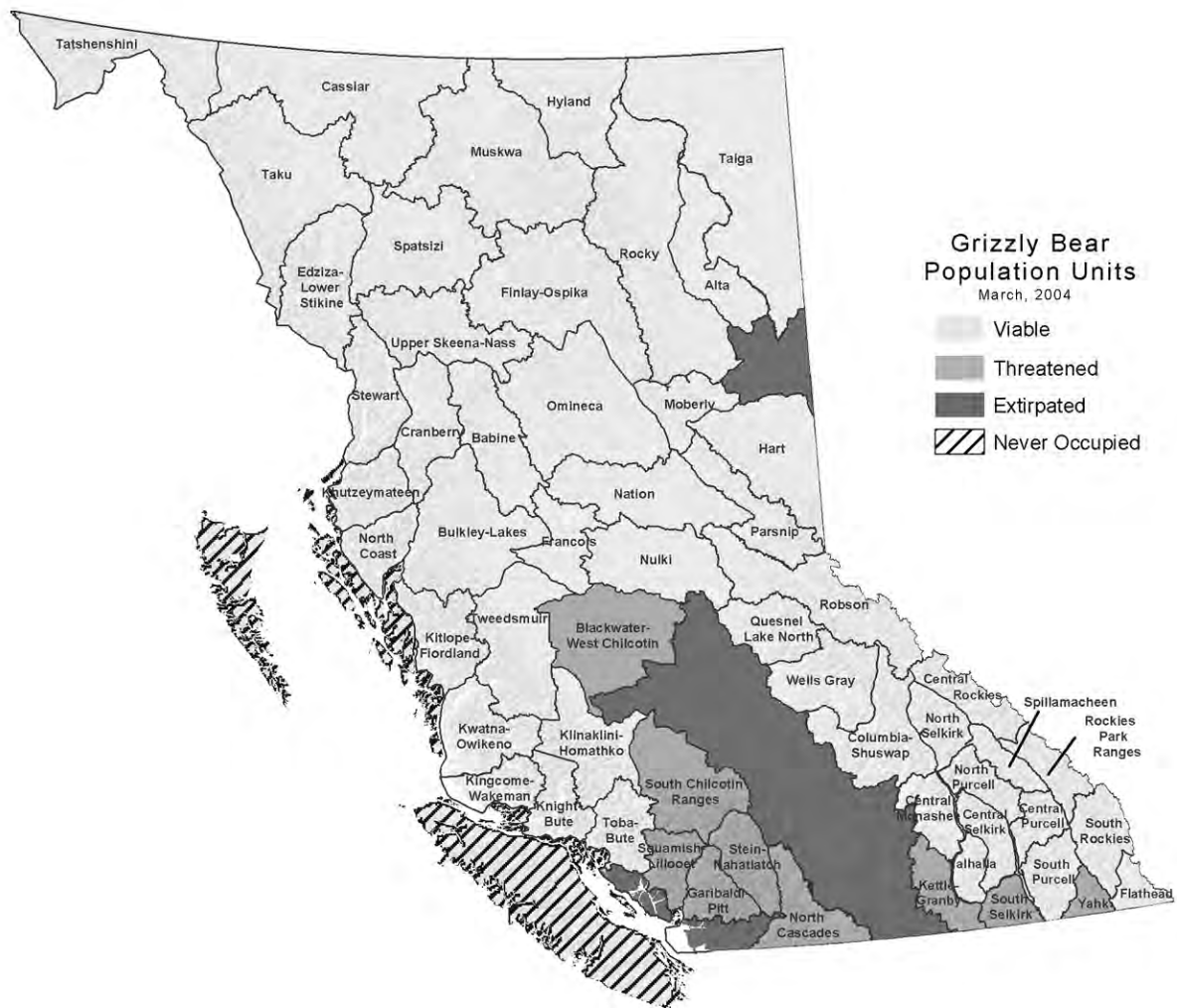


Figure 1. Status of Grizzly Bear Population Units (MWLAP). Population conservation status is based on the percentage the current population estimate represents of the capability of the habitat to support Grizzly Bears. The conservation status categories are: Viable $\geq 50\%$; Threatened $< 50\%$.

and adjacent areas of the interior mountains, people killed 77–85% of 99 radio-collared bears known or suspected to have died during 13 radio-collaring studies in a 22-year period (McLellan et al. 2000). In British Columbia where Grizzly Bear hunting was permitted, legal harvest accounted for 39–44% of the mortality. The next leading cause of grizzly mortality was killing by people in self-defence or in defence of property or livestock. Similar extensive data to estimate mortality rates is not available for northern British Columbia where fewer radio-collaring studies have been undertaken.

Increased direct Grizzly Bear mortalities are often associated with increased road access (McLellan 1990). Roads result in Grizzly Bear mortalities both directly and indirectly (as well as habitat loss; see “Habitat threats”). The mechanisms in which mortality is increased include direct mortality both through collisions on major roads, and through hunting and poaching; habituation of bears to people when they come in close contact, and the eventual loss of some of these bears involved in human-bear conflicts; and social disruption of bears with other bears when bears start avoiding habitat near newly created roads (McLellan 1990). Most of the new road building in British Columbia stems from forestry, mining, and oil and gas development. Direct human-caused mortality represents a particularly significant threat when adult females are killed in small and localized populations that may have low immigration rates.

Isolation is a significant factor in long-term (100+ yr) viability of small isolated Grizzly Bear populations such as in the Yellowstone area in the northwestern United States (Mattson and Reid 1991). The low population numbers in some areas of British Columbia are so low as to make natural recovery almost impossible given that these areas can be fairly isolated from the other Grizzly Bear population and natural immigration is likely very low. The low population numbers and isolation of localized populations such as in the North Cascades (e.g., estimate of <20; Gyug 1998) may also be creating local inbreeding that may limit any population recovery in these areas in the absence of increased Grizzly Bear immigration.

By comparison to human-caused mortality, natural mortality factors seem to be relatively minor in Grizzly Bear populations (McLellan et al. 2000). There are no known diseases or parasites that appear to have impacts on natural populations of Grizzly Bears (IGBC 1987). Predation/cannibalism, particularly of young bears by older dominant male bears, appears to play a role in population regulation, but its extent is not well known. Malnutrition is a factor in cub mortality, often within the first 1–4 weeks of emergence from the den, indicating that the nutritional state of the pregnant female entering the den is important (IGBC 1987).

Habitat threats

Habitat loss, alienation (the displacement from otherwise suitable habitat), and fragmentation (the separation of previously continuous habitat into one or more disconnected pieces) occur on a broad scale as a result of expanding human settlement, increased access for forestry and other extraction industries, and forestry and fire suppression.

Human settlement

Urban and agricultural developments are concentrated in valley bottoms formerly used as spring habitats and as movement corridors between mountain ranges. These developments cause direct habitat loss as well as habitat fragmentation by isolating major protected areas, sometimes making them inadequate to maintain viable populations. The settlement patterns along major roads or highways also tend to cause habitat fragmentation. The increasing settlement patterns along the Highway 3 corridor through the Rocky Mountains in southern British Columbia is seen as one of the major population fragmentation causes preventing extensive Grizzly Bear population recovery in the northern Rocky Mountains of the United States.

Because Grizzly Bear populations are naturally found at low densities, large areas of occupied and connected habitat are required to ensure their long term viability. To sustain habitat supply for populations, individuals must be able to move freely among valued habitats, without being restricted by human-caused blockages or being attracted to mortality

sinks around human settlements. Because individuals tend to disperse very little from established populations (10–30 km; McLellan and Hovey 2001), it is necessary to maintain corridors of habitat between major protected areas that are also good habitat themselves and corridors must be “wide enough for male Grizzly Bears to live in with little risk of being killed” (McLellan and Hovey 2001).

Hydroelectric impoundments behind dams can significantly affect Grizzly Bears when lowland feeding areas, particularly important in spring, are flooded. The effect of dams, particularly on the Columbia River system, has been to stop anadromous salmon runs, which has probably significantly affected Grizzly Bear feeding opportunities over a very wide area as well.

Forest management

Before the advent of widespread fire suppression (about 1945), the primary forest disturbance regime was fire through most of the province. Currently, logging has replaced fire as the primary agent of forest succession, which can be expected to have an impact on Grizzly Bear habitat independent of any effects of increased access (Zager et al. 1983). Many post-fire habitats typically remain high productivity foraging sites (particularly for berries) for 35–70 years, and Grizzly Bears learn to rely heavily on these sites. Under current timber management and silvicultural regimes, extensive site preparation and soil disturbance by heavy machinery reduce berry productivity in clearcuts, and conifer stands are planted, managed, and tended so they close in and lose any berry foraging values within much shorter time frames than they might have had under natural wildfire regimes.

Grizzly Bears typically used forested habitats adjacent to open foraging habitats such as avalanche chutes, wet meadows, marshes and swamps, and subalpine meadows as security habitat and daytime bedding sites to avoid heat stress. Clearcutting the forests adjacent to these sites can significantly affect the suitability in these high value open sites.

Roads

Roads result in Grizzly Bear habitat alienation, (i.e., displacement from preferred habitats), as well as increased direct mortality from hunters, poachers, and management kills for bears that are not displaced (McLellan 1990; Mace et al. 1999). Vehicles on roads may harass bears, and roads tend to displace them from quality habitats (McLellan 1990). Roads also tend to result in increased human activity in areas, which increases chances for bear–human interactions that result in displacement from these habitats (as well as increases in direct mortality) (McLellan 1990).

The displacement of bears from linear habitats (i.e., roads) can also cause habitat fragmentation. In Banff National Park, the Trans-Canada Highway acts as a complete barrier to adult females, and secondary highways are only regularly crossed by female Grizzly Bears that are relatively habituated to people (Gibeau and Herrero 1998). In British Columbia, the Highway 3 corridor near Nelson/Castlegar/Trail/Salmo has been found to be a genetic barrier between southern Selkirk and central Selkirk mountain Grizzly Bear populations (Proctor 2001). Where there are still extant populations of Grizzly Bears in the northern United States, highways also cause habitat fragmentation (Servheen et al. 1998).

While the construction of access roads is not limited to forestry activities, most new roads constructed in British Columbia are to support forestry activities. The increased access allowed on even infrequently travelled roads has been shown to significantly affect habitat use by Grizzly Bears (e.g., Mace et al. 1996; Archibald et al. 1987; McLellan and Shackleton 1988). Even increases in non-motorized and non-hunting-related recreation allowed by increased access to areas can significantly affect Grizzly Bear habitat use (e.g., for mountain climbing) (White et al. 1998b). While road closures or access limitations can be implemented to reduce the effects of forest access roads on Grizzly Bears, road closures implemented in wildlife management areas on national forests in Idaho, Wyoming, Washington, and Montana were found to be relatively ineffective

(27%) at keeping all vehicles off closed roads (Havlick 1998).

Historically, conflict with ranchers and livestock grazing operations have been a major cause of Grizzly Bear population decline or local extirpation in the United States (Storer and Trevis 1978), and this impact is thought to have reduced British Columbia populations as well. Potential impacts include mortalities if ranchers shoot bears to protect livestock, competition for forage, displacement from or alteration of preferred habitats from grazing and trampling. Preferred habitats which may be impacted by grazing or trampling include wetland areas and fruit-producing areas (IGBC 1987). More information on grazing impacts on grizzly bears is provided in the IGBC (1987).

Legal Protection and Habitat Conservation

The Grizzly Bear is protected under the provincial *Wildlife Act* from unrestricted hunting. All hunting seasons on Grizzly Bears are managed through Limited Entry Hunts (LEH) open by lottery to resident hunters or by quotas granted to licensed guides. There are no LEH seasons on Grizzly Bears in any threatened Grizzly Bear Population Unit.

Within the occupied range of Grizzly Bears in British Columbia, >106 000 km² or 13.4% is protected. Some parks that are important for the conservation of Grizzly Bears include Khutzeymateen, Spatsizi, North and South Tweedsmuir provincial parks and Tatshenshini-Alsek National Park.

The Grizzly Bear Conservation Strategy (MELP 1995a) identified habitat as one of the key conservation needs for Grizzly Bears in British Columbia and established a framework for establishing Grizzly Bear management areas throughout the province. Habitat management would largely be achieved through strategic land use plans that would establish goals and objectives, and would set the means to attain those on publicly owned land in local areas throughout the province.

Strategic land use planning on publicly owned lands, either land use plans (LUP) or land and resource

management plans (LRMP), have been completed or approved in 73% of the province by area as of January 2002. LRMP processes are underway in an additional 12% of the area or the province.

Most of the strategic land use plans that have been completed or approved to date address Grizzly Bear habitat issues (Table 2), some in more detail and length than others. In particular, LRMPs such as the Okanagan-Shuswap and Kalum have addressed Grizzly Bear habitat issues at great length and in detail, while others, such as the Kootenay-Boundary LUP, appear to have treated Grizzly Bear habitat issues only in part, and the Kamloops LRMP is silent on the issue of Grizzly Bear habitat management.

Identified Wildlife Provisions

Sustainable resource management and planning recommendations

Given that Grizzly Bears have large home ranges, both the landscape and stand level requirements of Grizzly Bears should be considered during strategic or landscape level planning. Wildlife habitat areas may be established under strategic level plans to address stand level requirements, provided a timber supply budget is negotiated by the strategic level plan or under the IWMS provincial timber supply limit (see “Wildlife habitat area” below) when within a Threatened Grizzly Bear Population Unit or Grizzly Bear Management Area.

The following strategic level recommendations may be considered for translation into specific legal objectives, strategies, and general guidelines by the strategic level plan and must be clearly defined geographically at an appropriate map scale. The intent is to apply these recommendations to ensure that:

- ❖ adequate amounts of well-distributed, seasonally important habitats are available across the landscape and through time;
- ❖ these habitats can be effectively used by Grizzly Bears (i.e., areas are not unduly impacted by habitat fragmentation or displacement resulting from human activities); and
- ❖ human-caused mortality risks are minimized.

Table 2. Current approaches to Grizzly Bear habitat management within strategic land use plans in British Columbia. LRMPs are underway in the North Coast, Central Coast, Lillooet, and Sea to Sky. No LRMPs or LUPs are underway in Atlin-Taku, Dease Liard, Nass, Morice, Sunshine Coast, Merritt, or Chilliwack.

Strategic land use plan	Type of resource management zone (RMZ)	Approach to Grizzly Bear habitat management <i>General or specific objectives or area-based direction for Grizzly Bear habitat management</i>
Fort Nelson	37 area-specific RMZs	Objectives included recommendations to manage and minimize new access, to ensure industrial exploration and timber management activities are undertaken with sensitivity to Grizzly Bear habitat, and to identify and map important habitat elements incorporated into several RMZs.
Cassiar Iskut- Stikine	15 area-specific RMZs	Objectives include maintenance of large areas of high value Grizzly Bear habitat (which have been mapped) by maintaining areas of well-distributed, seasonally important habitats for Grizzly Bear across the landscape and through time. Strategies are spelled out and include managing all access to and activities in these areas, and maintaining mixes of seral stages for forage and other critical habitat features including connectivity of habitats. In addition, access management is to take into account high value Grizzly Bear habitats.
Mackenzie	72 area-specific RMZs and RM subzones	Under general directions the objectives are to identify and manage to conserve Grizzly Bear habitat to assist in sustaining viable populations; improve the management of interactions between Grizzly Bears and humans; and manage access to maintain healthy Grizzly Bear populations. Strategies to achieve these objectives are included (i.e., developing guidelines for silviculture, timing and activities in high or spring Grizzly habitats, establishment of WHAs).
Fort St. John	24 area-specific RMZs	Objectives and strategies are given for each RMZ, and include Grizzly Bear habitat management in some RMZs where Grizzly Bear management was a priority. For example, in one RMZ, an objective to “Maintain medium and high quality Grizzly Bear habitat” has strategies specified to identify and map the habitat; incorporate habitat protection criteria into landscape and stand level plans; plan and develop access to avoid habitats; incorporate habitats and connectivity corridors into landscape level plans; use WHAs, develop interagency plans where there is the potential for activities to negatively affect habitat; encourage the use of silvicultural systems that minimize negative impacts on habitat; and minimize impacts by ensuring that critical habitat areas are linked by connectivity corridors.
Dawson Creek	12 area-specific RMZs	Specific directions have been left to lower level planning initiatives. Several RMZs contain the following objective: “Manage medium and/or high capability Grizzly Bear habitat to assist in sustaining viable, healthy Grizzly Bear populations” using the strategy of identifying and mapping medium and high capability Grizzly Bear habitat, and incorporating into landscape unit level and operational planning.”

Strategic land use plan	Type of resource management zone (RMZ)	Approach to Grizzly Bear habitat management <i>General or specific objectives or area-based direction for Grizzly Bear habitat management</i>
Fort St. James	36 area-specific RMZs	Two objectives in general directions are to maintain or enhance Grizzly Bear habitat and populations, and to minimize conflicts in human–bear interactions. The strategies to achieve the first objective include completing Grizzly Bear habitat mapping in areas of concern; managing for a mosaic of habitat types and characteristics to ensure adequate seasonal foraging sites with adjacent cover; reducing habitat fragmentation by providing FENs or movement corridors; and in high Grizzly Bear habitat suitability areas, undertaking access management planning, establishing management zones around important and valuable habitats, timing development to minimize conflicts, minimizing Grizzly Bear displacement from preferred habitats, creating irregular edges and leaving cover within cutblocks and between cutblocks and roads, and locating roads to avoid valuable Grizzly Bear habitat.
Kispiox	18 area-specific RMZs (not including Protected Areas)	Extensive Grizzly Bear habitat management strategies are included in the general management directions, rather than in area-specific RMZs. Listed strategies include identifying and mapping high value habitat at the landscape planning level that will be protected through management strategies such as buffering with reserves, modifying silvicultural systems, and minimizing clearcut sizes; selection harvesting a minimum of 5% of the forested portion of high value Grizzly Bear habitat outside RMAs or WHAs; using established strategies for management of Grizzly Bear habitat in the development and review of landscape and operational plans, designation of Grizzly Bear management areas, co-ordinated access management plans and modified road construction; and restricting Grizzly Bear hunting in portions of the planning area as part of the provincial conservation strategy.
Kalum	Generic land use class RMZs	Grizzly Bear habitat importance, and objectives and strategies for management are extensively laid out at more length and with more specifics than in any other LRMP. Intent of these objectives and strategies was to maintain or restore Grizzly Bear habitats through access management and forage supply for identified watersheds; conserve, mitigate, or restore critical patch habitats at the stand level no matter where they occur; maintain current Grizzly Bear population density, distribution, and genetic diversity in each GBPU to ensure viability; and recover local Grizzly Bear population where appropriate. The Special RMZ class was divided into 9 types, one of which is “Grizzly Bear benchmark and linkages.” Three Special Grizzly Bear RMZs were created as benchmark or linkage habitats where no hunting is allowed, in addition to the general management directions.
Bulkley	Generic land use RMZs, with	12 Planning Units overlaid on RMZs Specific directions for Grizzly Bear management are given in each of 12 Planning Units (or for subunits). Directions are relatively generic, e.g., “Maintain goat and Grizzly Bear habitat. Prescriptions will focus on the importance of maintaining Grizzly Bear habitat, especially that required for travel and denning,” or “Complete Grizzly Bear interpreted ecosystem mapping and incorporate into management prescriptions as directed by the Babine Local Resource Use Plan (LRUP). Actual management of habitats defaults to lower level plans (LRUP or IWMS).

Strategic land use plan	Type of resource management zone (RMZ)	Approach to Grizzly Bear habitat management <i>General or specific objectives or area-based direction for Grizzly Bear habitat management</i>
Lakes	Established generic land use RMZs	General management direction objectives are to “maintain the diversity and a suitable abundance of wide ranging carnivore populations and the ecosystems upon which they depend.” Strategies to implement this for Grizzly Bears include upgrading capability/suitability mapping, establishing Grizzly Bear management plans and management areas in accordance with the provincial Grizzly Bear conservation strategy, and implementing Grizzly Bear management guidelines in areas of important habitat capability and known occurrence of Grizzly Bear.
Vanderhoof	20 area-specific RMZs	Under general management directions, the objective is to maintain or enhance Grizzly Bear populations and habitat by identifying and mapping of high suitability and capability Grizzly Bear habitat, by deactivating non-essential secondary roads and minimizing the amount and duration of new road access in high value habitats, and by managing for a mosaic of habitat types and characteristics. Further strategies for Grizzly Bear habitat management are made in some RMZs but are fairly generic, referring to inventory of habitats, maintenance of habitats, and “establishment of appropriate management plans.”
Prince George	54 area-specific RMZs	Addressed in each area-specific RMZ. For example, within RMZ#1, the Parsnip High Elevation RMZ in the Special Resource Management Category-Natural Habitat, the objective is to “manage Grizzly Bear habitat to provide opportunity for population levels to increase” by identifying areas of high suitability and critical habitat where there will be access management planning with the intent of deactivating non-essential roads and minimizing the amount and duration of new roaded access, where the use of sheep in vegetation management will be avoided, where a mosaic of habitat types and characteristics and stand attributes that mimic habitat most suitable for Grizzly Bears, and where disturbance will be avoided to known Grizzly Bear denning sites.
Robson Valley	23 area-specific RMZs	General objective is to “maintain or enhance habitat and/or increase numbers, genetic variability, and distribution” through 9 strategies including identifying, conserving, and managing critical habitat in medium and historically high density bear zones, encouraging land use practices that promote the long-term viability of important forage species, managing road access, establishing Grizzly Bear management areas or other land use designations that benefit Grizzly Bear populations, ensuring the continued existence of adequate seasonal foraging sites with adjacent cover, minimizing bear displacement from preferred habitat by preventing habitat fragmentation, locating roads to avoid avalanche paths, leaving forest reserves of 100 m on each side of important avalanche paths, and timing human activities to avoid conflicts with concentrated seasonal bear use areas. Within individual RMZs, the above objective is repeated for wildlife with area-specific strategies on access and on reducing conflicts between Grizzly Bears and commercial recreation use, mining development, and range use.

Strategic land use plan	Type of resource management zone (RMZ)	Approach to Grizzly Bear habitat management <i>General or specific objectives or area-based direction for Grizzly Bear habitat management</i>
Kamloops	6 land use classes with smaller RMZs	Not addressed.
Okanagan-Shuswap	Resource-Use Specific RMZs which overlap with other RMZs	RMZs established for Grizzly Bear habitat management, which overlap with RMZs for other species or other land uses. The Grizzly Bear RMZ establishes (in much more detail than most other LRMPs) the locations of areas managed as Grizzly Bear habitat; and provisions for maintaining screening, security, and thermal cover adjacent to critical habitats. It also establishes how to maintain or enhance forage availability, cover, and connectivity; how to minimize negative interactions associated with access; and how to minimize negative interactions associated with commercial tourism and recreation developments.
Kootenay-Boundary LUP	RMZs are equivalent to forest districts	Addresses land use classes within RMZs by mapping Biodiversity Emphasis Zones, Connectivity Corridors, Enhanced RD Zones (Timber), Caribou Habitat Areas, and Areas managed for mature. The KBLUP-Implementation Strategy has only one objective relating to Grizzly Bear habitat: "To maintain Grizzly Bear habitat, retain adequate amounts of mature, and/or old forests, as determined through Objective 2, adjacent to important avalanche tracks."
Cariboo-Chilcotin LUP	3 resource development zones (RDZ)	Each RDZ is subdivided into areas for which the following clause, or a very close approximation, is included as resource targets: "To manage for Grizzly Bear, moose, furbearer, species at risk, and other sensitive habitats within the areas identified as riparian buffers, recreation areas, caribou habitat, and lakeshore management zones and throughout the polygon under the biodiversity conservation strategy."

Access

Where planning tables propose a conservation objective for Grizzly Bears, they should consider application of a variety of access management measures designed to ensure habitat security, prevent population fragmentation, minimize displacement from preferred habitat, and minimize mortality risk. Access management regimes should be applied over areas roughly equivalent to an average adult female home range, and the practices directed at ensuring adult female security and survival. Access management may include complete closure of roads, seasonal closure of roads, limiting access to commercial or industrial users only, or other access regimes designed to prevent displacement of Grizzly Bears from areas near roads.

Objectives should include provisions that maximize the net amount, quality, and seasonal representation of Grizzly Bear habitat that is >500 m from an open road (i.e., roads that receive any motorized use from 1 April to 31 October). Larger roadless areas (e.g., >1000 ha) are preferred. Wherever possible, retain these areas for at least 10 years. Similarly, objectives should include minimizing the amount of areas with >0.6 km/km² of open road (i.e., a road without restriction on motorized vehicle use) where these are in Grizzly Bear habitat. Consider also the following provisions:

- ❖ Promote one-side development (i.e., road construction and harvesting on one side of a valley at a time).
- ❖ Remove ballast from roads across avalanche chutes. Close permanent roads by removing bridges. Remove bridges when permanently deactivating roads. Revegetate temporary access (e.g., excavated or bladed trails), roads, and landings with non-forage species to minimize mortality risk of attracted bears.
- ❖ Minimize the impact of open roads on Grizzly Bears.
- ❖ Schedule forestry activities to avoid displacing bears from preferred habitat during periods of seasonal use.
- ❖ Provide windfirm visual screening along roads to provide security (i.e., do not conduct vegetation management or stand tending adjacent to roads).

Seral stage distribution

- ❖ Maintain or restore Grizzly Bear foraging opportunities and habitat effectiveness across the landscape and over time.
- ❖ Determine current and future forage values and habitat effectiveness of planning area. Landscapes with extensive areas of mid-seral forest characterized by closed canopies, conifer dominance, and high stocking levels have little Grizzly Bear habitat value. Similarly, suitable foraging habitat may not be effective (i.e., useable) because of the proximity to human settlement, transportation routes, agriculture, or other human activities or development. Current forage values and habitat effectiveness at the landscape level can be determined through interpretations of ecosystem maps (e.g., TEM, PEM, BEI) or other surrogate maps using the 6-class wildlife habitat mapping system (RIC 1999). Interpretations should assess habitat effectiveness that may be reduced in areas near human settlement or developments, agricultural areas, and roads. In addition, the type of disturbance that has created early seral habitats, and likely outcome of the type of disturbance should be assessed. For instance, logging and wildfire both produce early seral habitats that may be mapped similarly by ecosystem mapping, but can be very different in the amount of foraging potential for Grizzly Bears, and in the length of time this foraging potential will be available to Grizzly Bears.
- ❖ Where developments reduce the effectiveness of habitat within a landscape, where forest succession is reducing foraging values, or where restoration is an objective, consider management of early seral stages to recover effectiveness lost to development or to forest succession. Foraging habitat can be created by creating early seral habitats, but only if managed effectively for Grizzly Bear forage, and remain useable by Grizzly Bears.
- ❖ Manage landscapes for steady levels of early seral habitat to avoid “booming” and “busting” forage supply.

Silviculture

- ❖ Lower conifer stocking levels to provide Grizzly Bear forage.

- ❖ In NDTs 1–3, retain 50% of the largest pieces (top 20% diameter and length) of coarse woody debris in decay classes 1–2 for summer foraging on ants.
- ❖ Do not use broadcast vegetation management methods in capable watersheds, except where stand establishment or re-establishment is the objective and broadcast methods are required. Vegetation management methods, listed in increasing order of impact on Grizzly Bear forage are manual, chemical, cover crops, and sheep grazing.
- ❖ Do not use sheep, domestic goats, or cattle for vegetation management in occupied Grizzly Bear habitat to reduce direct and indirect conflicts with bears.

Range

- ❖ Consider establishing zones where range permits will be gradually removed and no new permits issued to reduce direct and indirect conflicts with Grizzly Bears. Use the effectiveness classes (based on BEI or finer-scale mapping interpreted for Grizzly Bear seasonal habitats with the application of habitat effectiveness from roads and human settlement) to decide where to limit grazing.

Restoration

- ❖ Conduct controlled burning to improve berry production (e.g., in ESSF).
- ❖ Plan for extended rotations to recover mature and old-growth characteristics such as more open canopies, greater amounts of understorey forage, and/or large trees (e.g., for rain interception in bedding habitat on coastal floodplains).
- ❖ Implement thinning and/or pruning to maintain open stands.
- ❖ Commercially thin to reopen closed canopies and recover productive shrub understories. Consider uneven spacing to maximize forage benefit.

Preventing human–bear conflict

- ❖ Maintain “attractant”-free main and fly-in camps (e.g., camps for tree planters, cruisers, engineers). Ensure adequate food storage and garbage management.

Wildlife habitat area

Goals

Protect known areas of concentrated seasonal use by Grizzly Bears.

Maintain the ecological integrity of important seasonal habitats.

Ensure the security of the bears using these habitats.

Feature

Establish WHAs for provincially significant areas, or for seasonally important habitats used by Grizzly Bears on a more local basis. Areas that are of provincial significance are those areas of known, consistently high, seasonal congregations of Grizzly Bears. Areas of seasonally important habitats may include salmon spawning areas where Grizzly Bears feed, herb-dominated avalanche tracks and run-out zones on southerly and westerly aspects, and known denning areas. On the coast, important seasonal habitats may also include estuaries, skunk cabbage swamps, and non-forested fen/marsh complexes. In the interior, seasonally important units may include herbaceous riparian meadow/wetland complexes, post-fire stands dominated by *Vaccinium* spp., subalpine parkland meadows, and *Hedysarum* and glacier lily complexes. Seasonally important habitats will be evaluated by Grizzly Bear Population Unit or subpopulation unit. In general, the subpopulation units are equivalent in size to landscape units.

In the absence of higher level plan direction, WHAs established within the provincial IWMS timber supply impact limit will only be established within threatened Grizzly Bear Population Units and Grizzly Bear Management Areas designated under the *Wildlife Act*, except for sites where there is no timber supply impact or the site is considered provincially significant (i.e., areas of known, consistently high, seasonal congregations) and recommended by the Director of the Biodiversity Branch, B.C. Ministry of Water, Land and Air Protection.

Size

WHAs will range from 1 to 500 ha but will ultimately depend on area of use, extent of seasonal habitat, and buffer size required to meet goals and objectives.

Design

When the main objective is to minimize disturbance around seasonal concentrations, consider the use of the area by Grizzly Bears and ensure the WHA includes a sufficient management zone to prevent disturbance. When the main objective of the WHA is to maintain seasonally important habitats, the WHA will be based on the extent of the seasonal habitat plus ~50 m but may vary with patch characteristics and objectives.

Use 6-class seasonal Grizzly Bear habitat capability and suitability mapping, where available, to identify seasonally important habitats (see RIC 1999). This assessment should be based on applying the Grizzly Bear densities associated with each capability class at the landscape scale (see Table 3). The result will be an estimate of the number of Grizzly Bears the area could potentially support in each season based on habitat suitability and capability. The season or seasons that would potentially support the lowest number of Grizzly Bears may be limiting or restricting the ability of the area to support Grizzly Bears. The highest suitability habitats within this

limiting season(s) should then be considered priorities for protection through the establishment of WHAs depending on how restrictive the habitat “bottleneck” (i.e., limiting) may be and the habitat effectiveness of sites. Consideration should also be given to seasonal habitat effectiveness (e.g., an area may not be limited by the availability of suitable spring habitat; however, human activities disproportionately impact these habitats the area may be limited by the availability of effective spring habitat).

Otherwise use air photos, forest cover mapping, and any other appropriate sources of information combined with expert knowledge of Grizzly Bear habitat values and human impacts to qualitatively approximate the process described above.

General wildlife measures

Goals

1. Maintain ecological integrity of WHA.
2. Ensure security of Grizzly Bears within WHA by minimizing disturbance to bears within WHA.
3. Maintain Grizzly Bear forage values within WHA.
4. Minimize human-bear interactions.
5. Maintain windfirmness.

Table 3. Habitat capability and suitability classes and associated densities for Grizzly Bears*

Habitat capability or suitability class	Habitat capability or suitability range as % of provincial benchmark density	Grizzly Bear population density	
		Minimum bears/ 1000 km ²	Maximum bears/ 1000 km ²
1 – Very High	76–100	76	100
2 – High	51–75	51	75
3 – Medium	26–50	26	50
4 – Low	6–25	6	25
5 – Very Low	1–5	1	5
6 – Nil	0	0	1

* These densities are suitable to use with 1:250,000+ scale mapping; relative densities should be applied to more detailed mapping.

Measures

Access

- Do not construct roads, trails, or landings.

Harvesting and silviculture

- No forestry practices should be carried out with the exception of treatments approved by the statutory decision maker to restore or enhance degraded habitat or to ensure windfirmness.

Pesticides

- Do not use pesticides.

Range

- Plan livestock grazing to maintain forage value for Grizzly Bears and minimize the potential for conflicts.
- Do not place livestock attractants within WHA.
- Incorporate management strategies in the range use plan to reduce contact and competition between livestock and Grizzly Bears. Consider salt placement, alternate water development, drift fencing, or altering periods of livestock use.

Additional Management Considerations

Ensure that Grizzly Bears do not have access to unnatural food sources (garbage) because of the consequent mortality risk.

Development around security and foraging WHAs should be managed to prevent disruption of natural influences of above- and below-surface drainage, shade, wind, and snow movement within the WHA.

Maintain livestock health.

Do not turn livestock out onto WHAs for Grizzly Bears during calving or lambing times.

Information Needs

1. Further development and application of techniques to monitor Grizzly Bear population and habitat trends.
2. Additional research on effects of human activities on Grizzly Bear habitat use (i.e., temporal response to access management).

3. Further development of techniques for assessing the impacts of proposed developments and land uses and for setting strategic objectives for Grizzly Bear habitat conditions.

Cross References

Bull Trout, Marbled Murrelet

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Appendix 2c

Wildlife: Pacific Water Shrew



ORDER – WILDLIFE HABITAT AREAS
2-514, 2-515, 2-667 to 2-669
Pacific Water Shrew – Chilliwack Forest District

This Order is given under the authority of sections 9(2) and 10(1) of the *Government Actions Regulation* (B.C. Reg. 582/2004) (GAR).

1. The delegated decision maker, being satisfied that the following area contains habitat that is necessary to meet the habitat requirements of a species at risk – Pacific Water Shrew (*Sorex bendirii*) orders that
 - a) this Order cancels and replaces the Order associated with Wildlife Habitat Areas (WHA) 2-140, 2-144 and 2-147 for Pacific Water Shrew that became effective October 23, 2007 and is titled “Order – Wildlife Habitat Areas # 2-140, 2-144, 2-147 Pacific Water Shrew – Chilliwack Forest District”;
 - b) the areas shown in the map set out in the attached Schedule A (2-514, 2-515, 2-667 to 2-669) and contained in the WHA spatial layer stored in the Geographic Warehouse (WHSE_WILDLIFE_MANAGEMENT.WCP_WILDLIFE_HABITAT_AREA_POLY) are established as wildlife habitat areas 2-514, 2-515, 2-667 to 2-669 for Pacific Water Shrew. The centre point of the line on the attached Schedule A is what establishes the WHAs; and
 - c) if there is a discrepancy between the areas shown in the map set out in the attached Schedule A and the WHA spatial layer stored in the Geographic Warehouse (WHSE_WILDLIFE_MANAGEMENT.WCP_WILDLIFE_HABITAT_AREA_POLY), the areas as detailed in the WHA spatial layer will take precedent.
2. The delegated decision maker, being satisfied that
 - i. the general wildlife measures (GWMs) described below are necessary to protect and conserve the WHAs being established for Pacific Water Shrew; and
 - ii. GAR or another enactment does not otherwise provide for that protection or conservation;orders that
 - a) the GWMs outlined in Schedule 1 are established for WHAs 2-514, 2-515, 2-667 to 2-669.
3. Pursuant to section 7(3) of the *Forest Planning and Practices Regulation* the person(s) required to prepare a forest stewardship plan are hereby exempted from the obligation to prepare results or strategies in relation to the objective set out in section 7(1) of the *Forest Planning and Practices Regulation* for Pacific Water Shrew in the Notice for the Chilliwack Forest District.

Definitions:

Words and expressions not defined in this Order have the meaning given to them in the *Forest and Range Practices Act* (FRPA) and the regulations made under it, unless context indicates otherwise.

Traditional and cultural activities are as defined in the *Free Use Permit Regulation* of the *Forest Act*.

Schedule 1 – General Wildlife Measures:

Access:

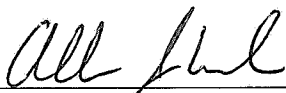
- 1) Do not construct roads, trails, landings or stream crossings in the WHA.
- 2) GWM 1 does not apply if:
 - a) road construction, road extension and/or stream crossings are required through WHA 2-515 to access timber beyond the WHA;
 - b) open bottom or clear span structures are used for all stream crossings related to roads referred to in GWM 2 (a); and road construction or stream crossings result in:
 - i) no introduced sediment to any watercourse;
 - ii) no erosion to any watercourse;
 - iii) no alteration of stream or wetland hydrology; and
 - iv) no destruction of functional habitat, wherever practicable.

Harvesting:

- 3) Do not harvest timber in the WHA.
- 4) Do not salvage timber in the WHA.
- 5) GWM 3 does not apply if:
 - a) timber harvesting occurs in an area that is not currently functional habitat, and will not reasonably become functional habitat for Pacific Water Shrew;
 - b) timber harvesting occurs in the outer 10m of the WHA to result in better management of windthrow risk or forest health issues related to maintaining functional habitat in the remainder of the WHA;
 - c) it is necessary to create guyline tiebacks (anchors or tailholds) in the WHA for timber harvesting associated with landings/cut blocks outside the WHA;
 - d) trees felled in accordance with GWM 5 (c) are retained on-site to function as coarse woody debris, unless the felled tree poses a forest health risk; or
 - e) cutting of trees is for the purposes of traditional and cultural activities, as authorized under a Free Use Permit issued under the *Forest Act*.

Pesticides:

- 6) Do not use pesticides, except for:
 - a) *Bacillus thuringiensis* var *kurstaki* for the control of western spruce budworm;
 - b) beetle pheromones for the control of bark beetles; and
 - c) herbicides to control invasive plants or noxious weeds, if applied by:
 - i) stem injection, cut and paint, foliar wipe or other direct plant application; or
 - ii) spot spraying individual plants or a cluster of plants if direct plant application is not practicable.



Signed this 21 day of August, 2017

Allan Johnsrude, Regional Executive Director

South Coast Natural Resource Region

Ministry of Forests, Lands, Natural Resource Operations and Rural Development

Appendix 1:

The following information is provided as background information and support to the Order establishing WHAs 2-514, 2-515, 2-667 to 2-669. This appendix is not part of the Order.

1. **Activities to which the Order does not apply:** Section 2(2) of the *Government Actions Regulation* states

An Order under any of sections 5 to 15 does not apply in respect of

- (a) any of the following entered into before the Order takes effect:
 - (i) a cutting permit;
 - (ii) a road permit;
 - (iii) a timber sale licence that does not provide for cutting permits;
 - (iv) a forestry licence to cut issued by a timber sales manager under section 47.6 (3) of the *Forest Act*;
 - (v) subject to subsection (3), a minor tenure,
- (b) a declared area,
- (c) areas described in section 196 (1) of the Act, and
- (d) areas referred to in section 110 of the *Forest Planning and Practices Regulation* (FPPR).

2. Authority to consider an exemption from these GWMs is provided in section 92(1) of the FPPR, and section 79(1) of the *Woodlot License Planning and Practices Regulation*. An exemption may be provided if the Minister's delegate is satisfied that the intent of the GWM will be achieved or that compliance with the provision is not practicable, given the circumstances or conditions applicable to a particular area. In this situation, the delegated decision maker may also consider if the exemption affects critical habitat since the federal Recovery Strategy has been approved and the province is expected to demonstrate effective protection of that habitat.

An exemption application should be submitted to the Minister's delegate (FLNR, Director of Resource Management) with a rationale describing the nature of the problem and options to integrate Pacific Water Shrew conservation with proposed forest and/or range practices. This submission will assist in timely consideration of the matter, and will inform the conditions, if any, of the exemption that may be granted prior to commencement of activities. Upon receipt of a complete exemption application, a determination will normally be made within 14 calendar days of arrival at the FLNR regional office. Incomplete packages will be returned to the proponent for re-submission. A template for exemption requests is available at:

<http://www.env.gov.bc.ca/wld/frpa/index.html>

3. Regarding parts of GWM 1, 3 and 5, the intent is to conserve habitat for Pacific Water Shrew that is or may become functional. However, as per GWM 5(a) it is possible that some small areas near the external WHA boundary are not functional habitat and will never function as Pacific Water Shrew habitat, and where this is determined by a qualified person, timber harvesting may occur. Further, as per GWM 5(b), it is possible that windthrow or forest health risk to functional habitat may be evaluated as significant enough to warrant windfirming techniques or tree removal to occur in the outer 10m of the WHA. A qualified person with the appropriate forest background and Pacific Water Shrew habitat expertise should make the determinations in GWM 5(a) & (b). A rationale to support the determination is to be kept on file and made available to a government official upon request.

4. Regarding GWM 1, where roads, trails, landings, or stream crossings may be necessary and are authorized in the WHA (via exemption or not covered by GWM 2) the following conditions should be expected:
 - a. that roads and stream crossings are to be temporary, except if required as mainline roads or bridges, and constructed with minimum road bed and right-of-way clearing widths;
 - b. that landings and trails are to be temporary;
 - c. during any design, construction, or maintenance activity near streams or wetlands, ensure that water quality and hydrology is maintained by controlling erosion and sediment sources (e.g. revegetate exposed soil with native grasses) and preventing water diversion;
 - d. all roads, trails, landings or stream crossings, except mainline roads or mainline stream crossings, are to be deactivated within one year after regeneration date if practicable; or otherwise within one year after the last silviculture treatment performed to achieve free to grow. Deactivation methods are to minimize risk of water diversion, stream or wetland sedimentation and erosion;
 - e. stream crossings, either temporary or permanent, must use open-bottom or clear span structures of sufficient size to ensure the structure does not encroach on the stream channel width, and maintains unimpeded upstream and downstream movement for Pacific Water Shrew (i.e. bridges or open-bottom culverts); and
 - f. wherever practicable, approved activities will not result in destruction of functional habitat.
5. GWM 1 does not apply to road or stream crossing maintenance, deactivation or brushing within the right-of-way on existing roads or stream crossings in the WHA (note: permanently altered habitats, like road surfaces, are not considered to be critical or functional habitat). These activities should use methods that minimize risk of water diversion, stream or wetland sedimentation and erosion, and altering hydrology. All work should be carried out in a manner that will not affect the intent or integrity of functional habitat in the WHA.
6. It should be understood that the WHA boundary is 100m wide on each side of a water feature or 100m in width surrounding a wetland.
7. In regards to generally locating roads, trails or stream crossings, where options exist and wherever practicable, construct roads, trails or crossings downslope of WHAs. If constructed upslope, implement sediment and erosion control measures to maintain water quality and prevent water diversion such that functional habitat is not affected.
8. In regards to accurately mapping WHA water features, it is acknowledged that accuracy is limited to that of the underlying map base (usually TRIM at 1:20,000 scale). If a map error occurs between the projected map location of a stream or wetland and its actual on the ground location, the on-ground location takes precedence. Proponents that notice this mapping accuracy error (e.g. when mapping for forest activities purposes) are asked to submit the actual stream location to the Director of Resource Management, South Coast Natural Resource Region, FLNR (via ESRI shape files) so that the WHA boundary location can be corrected.
9. Proponents should notify the Director of Resource Management, South Coast Natural Resource Region, FLNR when deactivation of temporary/spur roads is complete.

10. Anyone required to implement this Order should also be aware of potential overlap between these WHAs and other Orders (mostly for Spotted Owl or Ungulate Winter Range) and that there may be other GWMs that apply in each WHA. If this occurs, it will be important to follow the most conservative GWM for the overlapping area.
11. These GWMs do not apply to persons who must comply with the *Worker's Compensation Act* and the regulations under that Act (e.g. danger tree felling, OH&S Regulation part 26). Where a GWM cannot be achieved due to a worker safety concern, a person should consider developing a rationale related to the safety issue and keep it on file to be made available to a government official upon request. Consistent with section 2(3) of the FPPR, exemptions from these GWMs are not required to meet safety requirements.

PACIFIC WATER SHREW

Sorex bendirii

Original¹ prepared by Pontus Lindgren

Species Information

Taxonomy

Shrews belong to the Soricidae family, of which there are 13 species in Canada and nine species in British Columbia. The Pacific Water Shrew (*Sorex bendirii*), also referred to as the Marsh Shrew (Pattie 1973; Maser and Franklin 1974; Whitaker and Maser 1976; McComb et al. 1993) and Bendire's Shrew (Cowan and Guiguet 1973; Banfield 1974), has three sub-species, of which only *S. bendirii bendirii* is found in British Columbia.

Description

The Pacific Water Shrew is the largest shrew in the province (Nagorsen 1996) and the largest species of the *Sorex* genus in North America (Maser 1998). Nagorsen (1996) states that this shrew has an average length of 154 mm, of which 70 mm is tail, and weighs an average of 13.2 g. It has velvety dark chocolate brown fur that is only slightly paler on its ventral surface than its dorsal surface. The Pacific Water Shrew molts; however, the summer pelage is very similar in colour to the winter pelage (Banfield 1974). The tail is unicoloured and, like the body, is also dark brown. Adapted for its semi-aquatic lifestyle, it has a row of stiff fringe hairs on the toes of its hind feet. While submerged, this shrew maintains its body temperature with an insulating layer of air trapped within its fur, giving the shrew a silvery appearance while in the water (Calder 1969; Nagorsen 1996). In addition to being able to dive, air bubbles trapped beneath the feet provide enough buoyancy to enable this shrew to run on the surface of the water for up to 5 seconds. The Pacific Water Shrew is active during all hours of the day and throughout the year (Maser 1998).

The Common Water Shrew (*S. palustris*) is similar to the Pacific Water Shrew in several ways; it too is a large shrew, inhabits the Lower Mainland, lives close to water, has fringe hairs on its hind feet, can dive, and can run for short distances on top of water. However, within British Columbia, these shrews are often separated by elevation; the Common Water Shrew is usually found within habitats above 850 m while the Pacific Water Shrew typically inhabits areas below 850 m (Nagorsen 1996). Where these species do occur together, a Common Water Shrew can be distinguished by its bicoloured body and tail (dark above and pale below) which differs from the solid dark colouration of the Pacific Water Shrew.

Distribution

Global

The Pacific Water Shrew is found within the coastal lowlands of the Pacific Northwest, from northern California to southern British Columbia (Nagorsen 1996).

British Columbia

Within British Columbia, the Pacific Water Shrew is restricted to the extreme southwest corner, occupying the Lower Fraser Valley. It has been observed as far east as the Chilliwack River and Agassiz and as far north as the north shore of Burrard Inlet (Nagorsen 1996).

Forest regions and districts

Coast: Chilliwack, Squamish

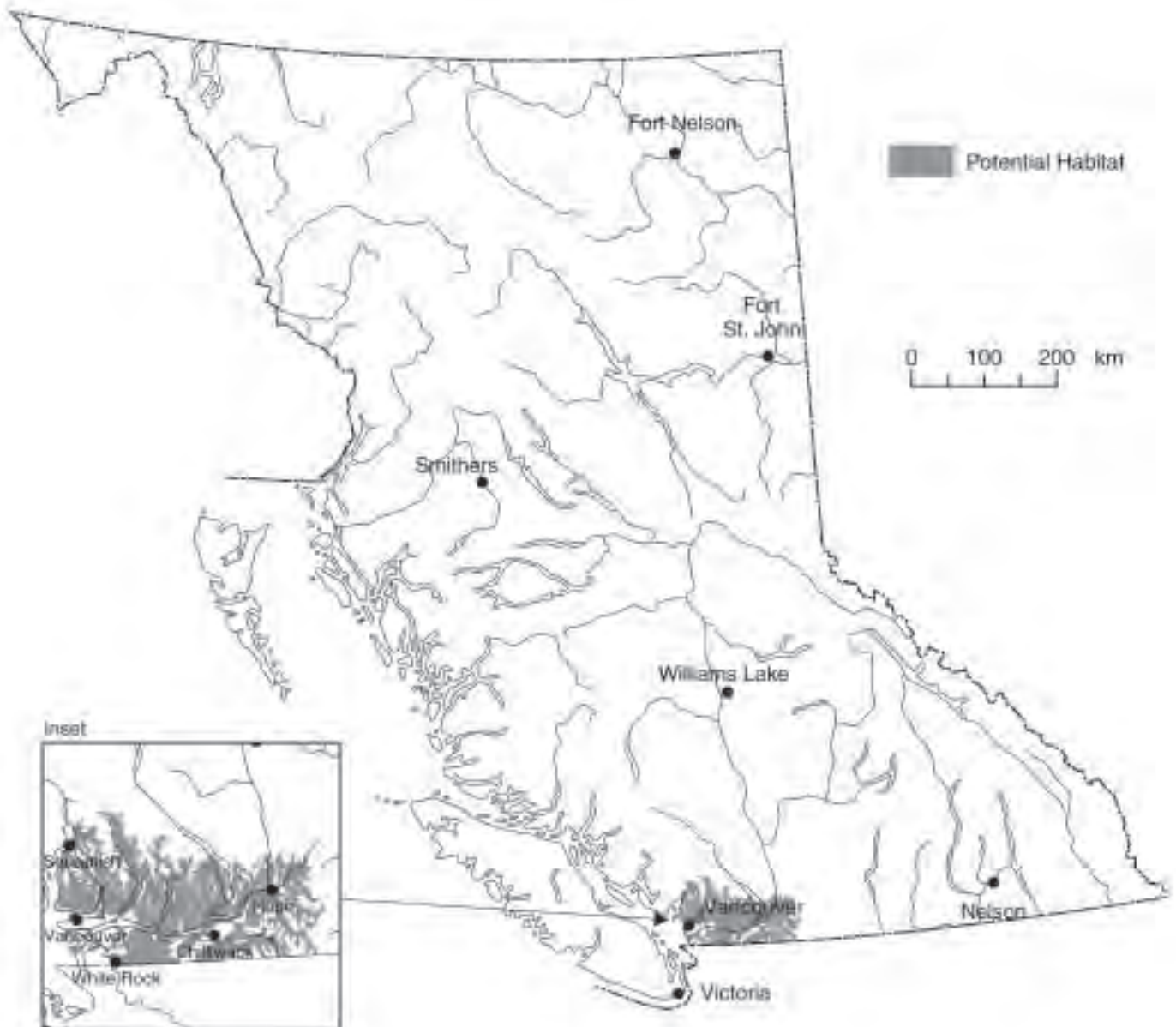
Ecoprovinces and ecoregions

COM: EPR, SPR

GED: FRL

¹ Volume 1 account prepared by L. Darling and K. Paige.

Pacific Water Shrew (*Sorex bendirii*)



Note: This map represents a broad view of the distribution of potential habitat used by this species. The map is based on several ecosystem classifications (Ecoregion, Biogeoclimatic and Broad Ecosystem Inventory) as well as current knowledge of the species' habitat preferences. This species may or may not occur in all areas indicated.

Biogeoclimatic units

CDF: mm

CWH: dm, ds1, ms1, vm1, xm1

Broad ecosystem units

CD, CH, CR, CW, FR, RS, WL

Elevation

Up to 850 m but is generally believed to inhabit areas below 600 m (Nagorsen 1996)

Life History

Diet and foraging behaviour

All shrews are insectivorous. Whitaker and Maser (1976) reported the Pacific Water Shrew as the most specialized feeder of the five species of shrews studied in western Oregon, with 25% of stomach contents consisting of aquatic prey. Unidentified insect larvae, slugs, and snails, Ephemeroptera naiads, unidentified invertebrates, and earthworms were the foods most frequently consumed by this shrew. Pattie (1969) observed that captive shrews immobilize their prey with several rapid bites along the length of the body. Prey animals appear to be located by sound and by exploring the forest floor and rotten logs with their sensitive vibrissae (whiskers) and flexible snout. These tactile senses also appear to be used when locating prey animals under water. Dives for prey can last up to several minutes (Pattie 1969). Although prey will be seized underwater, food is always consumed on land.

Reproduction

Very little is known about the breeding biology of the Pacific Water Shrew and no studies have been conducted in British Columbia. In other parts of its range, young are born in March with an average litter size of three or four (Nagorsen 1996) and a gestation period of about 3 weeks (Beneski and Stinson 1987). These shrews likely do not become sexually mature until they have overwintered; however, females may mature during their first summer. The Pacific Water Shrew is an early breeder, with pregnant females captured as early as February (Beneski and Stinson 1987). A pungent odour

originating from scent glands located on the flanks of males may function as a form of communication between sexes during the breeding season (Maser 1998). Shrews do not survive their second winter and may not survive their first (Nagorsen 1996). Pacific Water Shrews are assumed to survive only one overwinter period and have an average life expectancy of 18 months (Nagorsen 1996).

Home range

Very little is known about the home range size of the Pacific Water Shrew as removal methods used to sample this animal preclude such estimates. Harris (1984) reports a home range size of 1.09 ha; however, no sources for this estimate are provided.

Although a few Pacific Water Shrews have been captured considerable distances from water, probably related to juvenile dispersal (Maser and Franklin 1974), this shrew's affinity for slow-moving streams and marshes is well documented (Pattie 1973; Maser and Franklin 1974; Whitaker and Maser 1976; McComb et al. 1993; Zuleta and Galindo-Leal 1994; Nagorsen 1996; Maser 1998). In addition, both McComb et al. (1993) and Zuleta and Galindo-Leal (1994) report that capture rates are inversely related to distance from streams, and that most Pacific Water Shrews were found within 50 and 25 m of streams, respectively.

Movements and dispersal

Because of the removal methods used to sample the Pacific Water Shrew, very little can be said about the movements of this shrew. Young are assumed to disperse to suitable habitat after leaving the nest (Maser 1998).

Habitat

Structural stage

- 4: pole/sapling
- 5: young forest
- 6: mature forest
- 7: old forest

Important habitats and habitat features

Literature on habitat use by the Pacific Water Shrew is limited to only a few studies, most of which were conducted in Oregon and Washington. Two studies in Oregon report this shrew to be more abundant within mature and old forests (Corn and Bury 1991; Gilbert and Allwine 1991). Other studies in Washington describe this shrew to be equally, or more abundant, within young forests (Aubrey et al. 1991; West 1991). In a recent study conducted within the Lower Mainland, Zuleta and Galindo-Leal (1994) found three Pacific Water Shrews within widely separated habitats, ranging from deciduous to coniferous dominated sites with moderate to high canopy closure. It appears as though moist, coastal forests that border streams and skunk-cabbage marshes with an abundance of shrubs and coarse woody debris and extensive canopy closure are more important features than age of the forest (Nagorsen 1996). Likewise stream size may not be important but speed of water movement is likely important.

This semi-aquatic insectivore (25% of diet is aquatic invertebrates) requires access to slow-moving creeks and/or wetlands to forage. In addition to the aquatic food source, this shrew readily consumes terrestrial invertebrates found throughout the forest floor, especially within a well-developed litter layer and decomposed coarse woody debris. Forested riparian habitats typically provide both a well-developed forest floor as well as an abundant supply of coarse woody debris, making this habitat preferred foraging habitat for several species of insectivores (Nagorsen 1996).

Conservation and Management

Status

The Pacific Water Shrew is on the provincial *Red List* in British Columbia. It is considered *Threatened* in Canada (COSEWIC 2002).

Summary of ABI status in BC and adjacent jurisdictions (NatureServe Explorer 2002)

BC	WA	OR	CA	Canada	Global
S1S2	S5?	S4	S3S4	N1N2	G4

Trends

Population trends

Data on population trends of the Pacific Water Shrew are limited because of its rarity and the removal methods used for sampling this species. Although this species has probably never been abundant within any part of its global range, typically making up <1% of all small mammal captures (Aubrey et al. 1991; Corn and Bury 1991; Gilbert and Allwine 1991; West 1991), in British Columbia, fewer individuals have been documented recently than a century ago (Zuleta and Galindo-Leal 1994). Over the past 40 years, only 15 specimens have been collected and only eight extant occurrences have been identified, although more probably exist (Nagorsen 1996; CDC 2001). Because of the well-documented rarity of this shrew and the rapid degradation of critical riparian habitat resulting from urban sprawl and forestry operations throughout the Lower Mainland, the Pacific Water Shrew is undoubtedly experiencing a decline in population size within British Columbia (Galindo-Leal and Runciman 1994).

Habitat trends

Human developments, particularly urban and agricultural developments, have reduced or isolated much of the suitable riparian habitat for this shrew. During the past century, the aggregate channel length of small rivers and streams in Vancouver has been reduced from 120 to 20 km (Galindo-Leal and Runciman 1994). Approximately 15% of the streams in the Lower Fraser Valley have been lost and 71 % are considered threatened or endangered (Fisheries and Oceans Canada 1998). Additional habitat has likely been lost to industrial forest removal, although no studies have quantitatively assessed this type of development.

Threats

Population threats

Pacific Water Shrews are found in naturally low numbers (Aubrey et al. 1991; Corn and Bury 1991; Gilbert and Allwine 1991; West 1991), are habitat specialists (Nagorsen 1996), and within British Columbia, are found at their most northerly distribution (Zuleta and Galindo-Leal 1994).

Consequently, this shrew is particularly vulnerable to the loss or isolation of its preferred riparian habitat. An indirect human-caused threat to the population may be increased predation by domestic cats. The impact of the increase in coyotes over the range of this species is not known.

Habitat threats

Urban and agricultural developments pose the most significant threat to the habitat and survival of the Pacific Water Shrew in British Columbia. The limited distribution of this shrew in British Columbia coincides with the largest urban centre in the province (Lower Mainland). The dissection of the Lower Mainland by roads, highways, and power lines has created a fragmented landscape of isolated habitat patches, which may not be large enough to support a viable population of Pacific Water Shrew (Galindo-Leal and Runciman 1994). Even when patches appear to be large enough, edge effects may render the habitat unsuitable for a habitat specialist like the Pacific Water Shrew. Examples of edge effects particularly detrimental to the habitat of this shrew are loss of canopy closure resulting in decreased security cover (Galindo-Leal and Runciman 1994; Nagorsen 1996); increased human-related disturbance, which can penetrate up to 70 m from an edge (Matlack 1993); and increased predation by domestic cats on small animals, of which 80% of captures are shrews (Fitzgerald 1988). Although some studies indicate that this shrew may be able to cope with edge effects (e.g., Zuleta and Galindo-Leal [1994] captured this shrew within isolated, small habitats, and one, 20 m from a busy public street), no studies have addressed the long-term consequences of edge effects on this species.

Forest harvesting has received little attention with respect to Pacific Water Shrew because most of this species range coincides with urban areas, not Crown land. However, industrial forest removal potentially threatens Pacific Water Shrew habitat in Canada because Pacific Water Shrews have been captured in several locations on or near Crown land (Galindo-Leal and Runciman 1994). These locations include the Chilliwack River Valley (four occurrences), Sumas Mountain (eight occurrences), and several watersheds located north of the Lower Mainland and Fraser River (Coquitlam River area, one occurrence; Seymour River area, four occurrences; Alouette River area, one occurrence).

Water quality is also of concern. Because this shrew spends a considerable amount of time foraging for aquatic invertebrates (Pattie 1969; Whitaker and Maser 1976), changes in water quality caused by agricultural runoff, residential septic fields, erosion, and industrial waste can have detrimental effects on its food source as well as the habitat of the Pacific Water Shrew (Galindo-Leal and Runciman 1994).

Legal Protection and Habitat Conservation

The Pacific Water Shrew is protected, in that it cannot be killed, collected, or held in captivity without special permits, under the provincial *Wildlife Act*.

Several occurrences are protected within regional and provincial parks including Mount Seymour Provincial Park (3508 ha), Cultus Lake Provincial Park (656 ha), Aldergrove Lake Regional Park (250 ha), and Pacific Spirit Regional Park (763 ha).

The results based code recommendations for biodiversity and riparian areas may conserve several beneficial attributes of Pacific Water Shrew habitat where implemented. Where landscape level planning can address maintenance of landscape connectivity, particularly along natural features such as streams and rivers, or can address natural vegetative species composition and requirements for coarse woody debris retention, then the recommendations may partially address this species requirements.

Riparian management recommendations may in some cases partially address the requirements of this species. Current riparian management recommendations for streams and wetlands vary depending on the size and classification of the aquatic feature. General recommendations include minimizing windthrow risk; maintaining wildlife trees; and conserving stream channel shape, bank stability, water quality, as well as guidelines for minimizing detrimental effects of range, roads, and culverts. Where these recommendations are applied they may contribute to the maintenance of this species' habitat.

Protected areas or special resource management zones created for other species overlapping in distribution with the Pacific Water Shrew (i.e., Spotted Owl, tall bugbane, Coastal Giant Salamander) may afford additional protection.

Although these habitat provisions provide several beneficial recommendations for the habitats of the Pacific Water Shrew, these provisions are not sufficient to ensure the conservation of this rare taxon. In addition the range of this species overlaps with private land.

Identified Wildlife Provisions

Sustainable resource management and planning recommendations

Landscape level planning within the Chilliwack and Squamish forest districts should promote connectivity among remnant patches of suitable low elevation riparian habitat by restoring forest habitat along watercourses and wetlands. Whenever possible, large buffer widths around riparian areas should be maintained to compensate for the fragmentation that is occurring.

Wildlife habitat area

Goal

Protect current and historical habitat of the Pacific Water Shrew.

Feature

Establish WHAs at current or historical sites where suitable habitat still exists.

Size

Generally between 5 and 45 ha but ultimately depends on the area of suitable habitat.

Design

It is recommended that the WHA extend the entire length of the stream or wetland and include at a 30 m core area and a 45 m management zone on each side of the stream or around wetland/wetland complex. Measurements of slope distance should be consistent with the *Riparian Management Area Guidebook*. Where slopes exceed 60%, the WHA should extend to the top of the inner gorge

The WHA should include suitable riparian and aquatic habitats. Wetlands, streams, or other suitable riparian habitats (e.g., Skunk-Cabbage marshes) within 1 km should also be included wherever possible to increase the effectiveness of the WHA. Because of the linear shape of the species home range, the management zone is necessary to minimize potential detrimental edge effects which tend to be more pronounced within long thin habitats.

General wildlife measures

Goals

1. Maintain hydrological regime.
2. Maintain water quality and physical integrity of riparian habitat.
3. Maintain or promote microclimate and structural elements known to be preferred by this species (i.e., good ground cover of evergreen shrubs, large amount of coarse woody debris, abundance of fine litter, and moderate to high levels of canopy closure from coniferous, deciduous, or mixedwood forests).
4. Minimize edge effects.

Measures

Access

- Do not construct roads unless there is no other practical option.

Harvesting and silviculture

- Do not harvest or salvage within the core area.

- Use partial-harvesting systems in the management zone that maintain 70% basal area. Partial harvesting within the management zone should promote natural microclimate and structural elements such as multi-layered canopies, wildlife trees, and coarse woody debris.
- Restrict activities that may alter the vegetation, hydrology, stream structure, or soils, particularly the upper soil layers.

Pesticides

- Do not use pesticides.

Recreation

- Do not establish recreational trails or sites within a WHA.

Additional Management Considerations

When operating immediately adjacent to WHAs, consider the following recommendations:

- apply as many of the silviculture practices required within the WHA management zone, particularly practices that minimize edge effects and promote the retention of the forest litter layer, coarse woody debris, and wildlife trees (future coarse woody debris);
- minimize impacts of forest activities by harvesting one side of a stream at a time;
- extend green-up specifications within riparian and nearby habitats to allow this area to better recover prior to harvesting adjacent areas;
- employ partial cutting systems to reduce edge effects near riparian areas; and
- incorporate larger riparian buffers.

Because of the rapid urban development that coincides with the distribution the Pacific Water Shrew in British Columbia, much of this shrew's habitat has been destroyed or fragmented (Galindo-Leal and Runciman 1994; Zuleta and Galindo-Leal 1994; Nagorsen 1996). It is important to consider this species within urban planning and stewardship programs.

Information Needs

1. Using live-trapping methods, determine basic demographic parameters (i.e., home range size, movement patterns, ability to recolonize areas) and a better understanding of habitat preferences and limitations are needed.
2. Effects of habitat fragmentation on this shrew, and investigating the impact of domestic cat predation.

Cross References

Bull Trout, Coastal Giant Salamander, Coastal Tailed Frog, Keen's Long-eared Myotis, Marbled Murrelet, Sandhill Crane, tall bugbane

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Appendix 2d

Wildlife: Tall Bugbane



ORDER – Wildlife Habitat Areas

2-129, 2-139, 2-141 to 2-143, 2-145 and 2-146

Tall Bugbane - Chilliwack Forest District

This order is given under the authority of sections 9(2) and 10(1) of the *Government Actions Regulation* (B.C. Reg. 582/04).

The Deputy Minister of Environment orders that:

1. the wildlife habitat areas (WHA) shown in the map set out in the attached Schedule A (2-129, 2-139, 2-141 to 2-143, 2-145 to 2-146) and boundaries contained in the GIS file *twha_bc* are established, for Tall Bugbane (*Actaea elata*);
2. the general wildlife measures outlined in Schedule 1, of this order, are established for the WHAs in the attached Schedule A and boundaries contained in the GIS file *twha_bc*;
3. for the purposes of section 2(3)(a) of the *Government Actions Regulation*, these General Wildlife Measures apply to minor tenures;
4. where there is discrepancy between the WHA boundaries as shown in the attached Schedule A and the GIS file *twha_bc*, the boundaries as detailed in the GIS file will take precedent. The centre point of the line on the map denoting the WHA is what establishes the boundary; and
5. pursuant to section 7(3) of the *Forest Planning and Practices Regulation* the person(s) required to prepare a forest stewardship plan are hereby exempted from the obligation to prepare results or strategies in relation to the objective set out in section 7(1) of the *Forest Planning and Practices Regulation* for Tall Bugbane in the Notice for the Chilliwack Forest District.

Schedule 1 – General Wildlife Measures

Access:

- Do not construct roads, trails, landings or stream crossings in the core area or management zone of the WHA, particularly upslope of the population. Exemptions would only normally be considered for construction of roads, trails, landings or stream crossings in the management zone.
- Where roads, trails, landings or stream or stream crossings are determined to be necessary in the management zone of the WHA they should be temporary wherever possible.
- Where roads already exist or are determined necessary within the WHA, ensure road maintenance/deactivation practices do not damage or kill plants (e.g. do not mow or grade over roadside plants). Use methods to prevent spread of invasive species while not damaging native species.

- Wherever practicable, minimize damage to plants near the road edge when road maintenance is required to address safety concerns.

Harvesting:

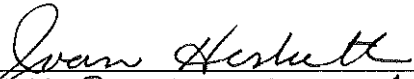
- Do not harvest, including salvage, within core area of the WHA.
- Use partial harvesting systems in the management zone that maintain at least 60% basal stem area. Remove up to 40% basal stem area in small openings ranging in size up to 0.5 ha. Small openings should be distributed throughout the management zone to maintain dispersal opportunity.
- When harvesting in the management zone, retain *Acer* species, particularly *Acer macrophyllum*. Retain at least 20-30% from inventory distribution.
- Do not salvage in the management zone unless it can be done without disturbing important structural elements (e.g. *Acer* species) or ecological conditions.
- If the WHA is overlapped by another WHA for a different species, ensure partial harvest strategy is coordinated between the general wildlife measures. The most conservative measure must apply to the overlapped area.

Silviculture & Pesticides:

- Activities to establish a free growing stand within the management zone will result in representation of deciduous species, specifically *Acer* species, in the free growing stand.
- Do not use pesticides.

Recreation:

- Do not develop recreational sites, trails, facilities, or structures within the WHA.


Signed this 24 day of August, 2007
Joan Hesketh, Deputy Minister
Ministry of Environment

Appendix 1:

The following information is intended to provide background information and support to the legal order establishing these WHAs. This appendix is not part of the legal order.

1. Authority to consider an exemption from these general wildlife measures is provided in Section 92(1) of the *Forest Planning and Practices Regulation*. In instances where it is not practicable to comply with these measures, a person proposing to conduct forestry activities should consider seeking an exemption from the requirements to comply with the applicable General Wildlife Measures.
2. An exemption application should be submitted to the Minister's delegate (Regional Manager – Ministry of Environment, for the Region that the WHA is located) with a rationale describing the nature of the problem and options to integrate WHA conservation with proposed forest practices. This submission will assist in timely consideration of the matter, and will inform the conditions, if any, of the exemption that may be granted prior to commencement of activities. Upon receipt of a complete exemption application, a determination will normally be made within 30 days of arrival. Incomplete packages will be returned to the proponent for resubmission.
3. Where existing forest recreation trails are located within the WHA, consider rerouting trails to outside the WHA.



ORDER – WILDLIFE HABITAT AREAS 2-567 to 2-579, 2-670
Tall bugbane – Chilliwack Forest District

This Order is given under the authority of sections 9(2) and 10(1) of the *Government Actions Regulation* (B.C. Reg. 582/2004) (GAR).

1. The delegated decision maker, being satisfied that the following area contains habitat that is necessary to meet the habitat requirements of a species at risk – tall bugbane (*Actaea elata* var. *elata*)
orders that
 - a) this Order cancels Wildlife Habitat Areas (WHA) 2-139, 2-141 and 2-146 for tall bugbane that became effective in the Order dated October 23, 2007 titled “Order – Wildlife Habitat Areas # 2-129, 2-139, 2-141 to 2-143, 2-145 and 2-146 Tall Bugbane – Chilliwack Forest District”, and replaces them with WHA 2-571 as described in 1 (b) directly below;
 - b) the areas shown in the map set out in the attached Schedule A (2-567 to 2-579 and 2-670) and contained in the WHA spatial layer stored in the Geographic Warehouse (WHSE_WILDLIFE_MANAGEMENT.WCP_WILDLIFE_HABITAT_AREA_POLY) are established as wildlife habitat areas 2-567 to 2-579 and 2-670 for tall bugbane. The centre point of the line on the attached Schedule A is what establishes the WHAs; and
 - c) if there is a discrepancy between the areas shown in the map set out in the attached Schedule A and the WHA spatial layer stored in the Geographic Warehouse (WHSE_WILDLIFE_MANAGEMENT.WCP_WILDLIFE_HABITAT_AREA_POLY), the areas as detailed in the WHA spatial layer will take precedent.

2. The delegated decision maker, being satisfied that
 - i. the general wildlife measures (GWMs) described below are necessary to protect and conserve the WHAs being established for tall bugbane; and
 - ii. GAR or another enactment does not otherwise provide for that protection or conservation;orders that
 - a) the GWMs outlined in Schedule 1 are established for WHAs 2-567 to 2-579 and 2-670.

Definitions:

Words and expressions not defined in this Order have the meaning given to them in the *Forest and Range Practices Act* (FRPA) and the regulations made under it, unless context indicates otherwise.

Traditional and cultural activities are as defined in the *Free Use Permit Regulation* of the *Forest Act*.

Schedule 1 – General Wildlife Measures:

Access:

1. Do not construct roads, trails, landings or stream crossings in the Core Area.
2. Do not construct roads, trails, landings or stream crossings in the Management Zone, unless there is no other practicable option.

Harvesting:

3. Do not harvest timber, including salvage, in the Core Area.
4. GWM 3 does not apply if:
 - a) it is necessary to create guyline tiebacks (anchors or tailholds) in the Core Area for timber harvesting associated with landings/cut blocks outside the Core Area;
 - b) trees felled in accordance with GWM 4 (a) are retained on-site to function as coarse woody debris, unless the felled tree poses a forest health risk; or
 - c) cutting of trees is for the purposes of traditional and cultural activities, as authorized under a Free Use Permit issued under the *Forest Act*.
5. Timber harvesting within the Management Zone will:
 - a) use partial harvesting to result in small canopy gaps up to 0.5 ha that retain at least 60% basal area; and will distribute the small gaps/openings throughout the Management Zone to provide opportunity for tall bugbane plant dispersal;
 - b) retain 20-30% of pre-harvest *Acer* species, particularly *Acer macrophyllum*;
 - c) retain, where safe, all non-merchantable trees and all understory deciduous trees and shrubs; and
 - d) use partial harvesting to result in windfirmness to the Core Area.
6. GWM 5 does not apply to BC Timber Sales Block VE118 (2 units) and Block VE119 in WHA 2-571.
7. Do not salvage timber within the Management Zone, unless it can be conducted without disturbing or damaging:
 - a) *Acer* species;
 - b) pre-harvest light conditions; and
 - c) pre-harvest soil moisture conditions.
8. Fall and yard away from Core Area. Retain those trees that cannot be safely felled away from Core Area as either part of the basal area retention or in wildlife tree patches.

Pesticides and Silviculture

9. Do not use pesticides, except for:
 - a) *Bacillus thuringiensis* var *kurstaki* for the control of western spruce budworm;
 - b) beetle pheromones for the control of bark beetles; and
 - c) herbicides to control invasive plants or noxious weeds, if applied by:
 - i. stem injection, cut and paint, foliar wipe or other direct plant application; or

- ii. spot spraying individual plants or a cluster of plants if direct plant application is not practicable; with no direct application to tall bugbane.

10. Activities to establish a free growing stand within the Management Zone will result in representation of *Acer* species.



Signed this 21 day of August, 2017

Allan Johnsrude, Regional Executive Director

South Coast Natural Resource Region

Ministry of Forests, Lands, Natural Resource Operations & Rural Development

Appendix 1:

The following information is provided as background information and support to the Order establishing WHAs 2-567 to 2-579 and 2-670. This appendix is not part of the Order.

1. **Activities to which the Order does not apply:** Section 2(2) of the *Government Actions Regulation* states

An Order under any of sections 5 to 15 does not apply in respect of

(a) any of the following entered into before the Order takes effect:

(i) a cutting permit;

(ii) a road permit;

(iii) a timber sale licence that does not provide for cutting permits;

(iv) a forestry licence to cut issued by a timber sales manager under section 47.6 (3) of the *Forest Act*;

(v) subject to subsection (3), a minor tenure,

(b) a declared area,

(c) areas described in section 196 (1) of the Act, and

(d) areas referred to in section 110 of the *Forest Planning and Practices Regulation* (FPPR).

2. Authority to consider an exemption from these GWMs is provided in section 92(1) of the FPPR, and section 79(1) of the *Woodlot License Planning and Practices Regulation*. An exemption may be provided if the Minister's delegate is satisfied that the intent of the GWM will be achieved or that compliance with the provision is not practicable, given the circumstances or conditions applicable to a particular area. In this situation, the delegated decision maker may also consider if the exemption affects critical habitat since the federal Recovery Strategy has been approved and the province is expected to demonstrate effective protection of that habitat.

An exemption application should be submitted to the Minister's delegate (FLNR, Director of Resource Management) with a rationale describing the nature of the problem and options to integrate tall bugbane conservation with proposed forest and/or range practices. This submission will assist in timely consideration of the matter, and will inform the conditions, if any, of the exemption that may be granted prior to commencement of activities. Upon receipt of a complete exemption application, a determination will normally be made within 14 calendar days of arrival at the FLNR regional office. Incomplete packages will be returned to the proponent for re-submission. A template for exemption requests is available at:

<http://www.env.gov.bc.ca/wld/frpa/index.html>

3. WHAs are designed to include a 50m Core Area surrounding the plant population, and usually a 150m to 200m Management Zone located outside of the Core Area. In a few cases, the shape of the Management Zone has been altered (skewed) to reduce timber impact by overlapping with another constraint, or to follow a logical boundary.
4. In respect of possible road or stream crossing exemptions from GWM 1, exemptions that may be granted will usually include conditions such as:

- a) roads and stream crossings are to be temporary, except if required as mainline roads or bridges, and are to be designed and constructed with minimum road bed and right-of-way clearing widths;
 - b) landings and trails are to be temporary;
 - c) during any design, construction, or maintenance activity near tall bugbane populations, ensure that activities do not damage or kill plants or negatively affect functional habitat; and
 - d) all roads, trails, landings or stream crossings, except mainline roads or mainline stream crossings, are to be deactivated within one year after regeneration date if practicable; or otherwise within one year after the last silviculture treatment performed to achieve free to grow. Deactivation methods are to minimize risk of damage to tall bugbane plants.
5. In regards to generally locating roads or stream crossings adjacent to a WHA, where location options exist, construct roads, trails or crossings downslope of WHAs. If constructed upslope, ensure activities will not damage or kill tall bugbane plants (e.g. by side-casting road material downslope into the WHA).
 6. GWM 1 does not apply to road or stream crossing maintenance, deactivation or brushing within the right-of-way on existing roads or stream crossings in the WHA. These activities should use methods that do not damage or kill tall bugbane plants (e.g. do not mow or grade over roadside plants); and use methods to prevent spread of invasive species (e.g. seed with native species). All work should be carried out in a manner that will not affect the intent or integrity of the WHA.
 7. For GWM 6 as it pertains to BC Timber Sales Blocks VE118 (2 units) and VE119, the cut block designs are as per the map dated October 1, 2015.
 8. The intent of GWMs 5, 7 & 8 is to maintain sufficient forest structure and microclimatic conditions in the WHA Management Zone to safeguard the Core Area and provide dispersal opportunity to tall bugbane.
 9. Anyone required to implement this Order should also be aware of potential overlap between these WHAs and other Orders (mostly for Pacific water shrew, Pacific giant salamander or Spotted Owl) and that there may be other GWMs that apply in each WHA. If this occurs, it will be important to follow the most conservative GWM for the overlapping area.
 10. These GWMs do not apply to persons who must comply with the *Worker's Compensation Act* and the regulations under that Act (e.g. danger tree felling, OH&S Regulation part 26). Where a GWM cannot be achieved due to a safety concern, a person should consider developing a rationale related to the safety issue and keep it on file. Consistent with section 2(3) of the FPPR, exemptions from these GWMs are not required to meet safety requirements.

TALL BUGBANE

Cimicifuga elata

Original prepared by Jenifer L. Penny

Species Information

Taxonomy

Tall bugbane is in the Ranunculaceae (buttercup) family. It is one of six *Cimicifuga* species in North America. There are no recognized infraspecific taxa. The taxonomy of the *Cimicifuga* genus is currently under review and may be included under the genus *Actaea*, in which case tall bugbane would be referred to as *Actaea elata*.

Description

Perennial, large-leafed understorey plant that stands 1–2 m tall. Stems are branched above and leaves are bi-ternate with 9–17, cordate to ovate, often palmate leaflets, which are usually three-lobed. This species has a dark, tuberous, horizontal rhizome. The inflorescence is a simple to compound raceme with 50–900 small, white, closely crowded flowers. Individual flowers are radially symmetrical and apetalous, and sepals are white or pinkish, falling off at once. Fruits are follicles, 9–12 mm long, sessile, appearing singly in the upper flowers, but in two's, and rarely, three's on the lower raceme. Follicles each contain approximately 10 red to purple-brown seeds.

Distribution

Global

Occurs from extreme southwestern British Columbia south to southwestern Oregon. It is rare throughout its entire range in the Pacific Northwest, but is particularly rare in British Columbia.

British Columbia

Only known from 10 sites near Chilliwack, British Columbia.

Forest region and district

Coast: Chilliwack

Ecoprovince and ecosection

COM: EPR, NWC

Biogeoclimatic units

CWH: dm, ms1

Broad ecosystem units

CD, FR

Elevation

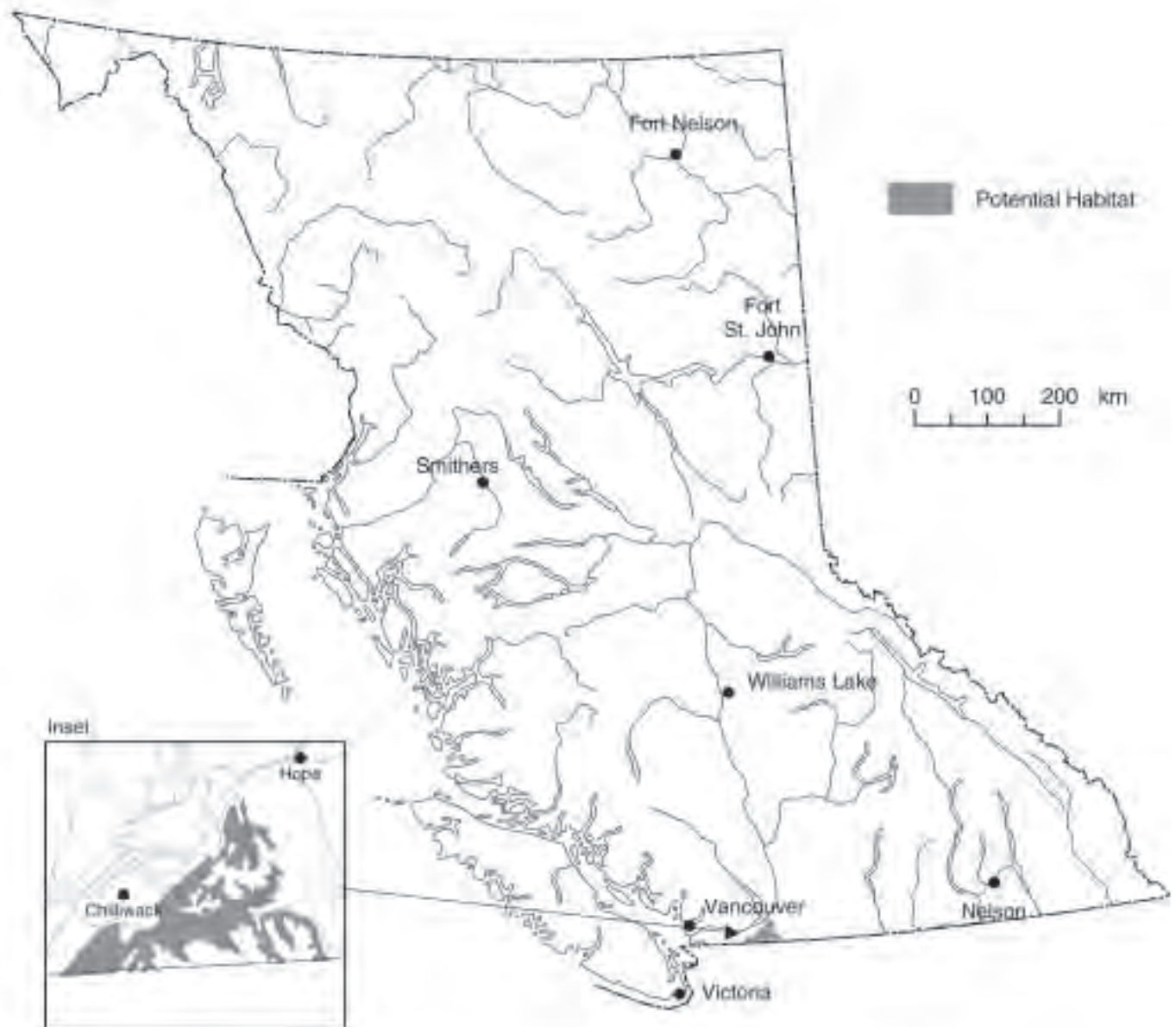
300–1300 m

Life History

Reproduction

Tall bugbane is a herbaceous long-lived perennial understorey plant. Young plants emerge in the spring, produce buds in late spring, and flower mid-June to August. In experiments, Kaye and Kirkland (1994) showed that seeds required cold-stratification for germination and that percentage germination was low. In growth experiments on tall bugbane using ample light, plants grew to reproductive size in 3 years (USDA For. Serv., USDI BLM, and U.S. Army Corps of Engineers 1996). Under less ideal conditions, time to reproductive size could be up to 6 years.

Tall Bugbane (*Cimicifuga elata*)



Note: This map represents a broad view of the distribution of potential habitat used by this species. The map is based on several ecosystem classifications (Ecoregion and Biogeoclimatic) as well as current knowledge of the species' habitat preferences. This species may or may not occur in all areas indicated.

Dispersal

Seeds are heavy, have no special dispersal mechanism, and are dispersed within a few metres of the parent plant (Kaye and Kirkland 1994; Wentworth 1996).

Habitat

Structural stages

- 1–3: non-vegetated to tall shrub (<15 yr)
- 4–6: pole/sapling to mature forest (70–150 yr)

Important habitats and habitat features

In British Columbia, this species grows in shady, moist, mature (70–150 yr) western redcedar forest, commonly in *Thuja plicata*-*Polystichum munitum*-*Achlys triphylla* communities. This species is nearly always associated with bigleaf maple (*Acer macrophyllum*). In Washington and Oregon, it generally requires a hardwood component in the canopy, subsurface moisture (often provided by creeks or rivers), and occurs on northerly slopes (Kaye and Kirkland 1994). In British Columbia, it has been found on road-cuts, in clearcuts, and in mature forests with strong deciduous components. Plants have also been observed in deciduous stands. Kaye and Kirkland (1999) describe tall bugbane as “light flexible” rather than old growth dependent and shade restricted (Collins et al. 1985).

The deciduous component of mixed forest is important in maintaining optimal light conditions for this species. Deciduous trees species that occur with tall bugbane include bigleaf maple (*Acer macrophyllum*), vine maple (*A. circinatum*), and Douglas maple (*A. glabrum* var. *douglasii*). Bigleaf maple is the most important as it occupies the forest canopy, increasing forest floor light during the spring. Natural canopy gaps provide the opportunity for flowering and establishment of progeny.

In British Columbia, known sites occur on 15–35° slopes with north, southwest, and south aspects. In southern populations (Oregon and Washington), this species nearly always occurs on northern slopes from east to west aspects. This may be an important distinction between northern and southern populations but needs to be confirmed.

Conservation and Management

Status

The tall bugbane is on the provincial *Red List* in British Columbia. It is considered *Endangered* in Canada (COSEWIC 2002).

Summary of ABI status in BC and adjacent jurisdictions (NatureServe Explorer 2002)

BC	WA	OR	Canada	Global
S1	S2	S2	N2	G2

Trends

Population trends

No long-term studies on population trends have ever been undertaken in British Columbia. However, two of the 10 populations in the Chilliwack River Valley (one of which has not been observed since 1957) appear to have been reduced due to extensive logging at the sites. One population was lost due to the development of a helicopter landing pad. All of the populations are small and sporadically distributed (Penny and Douglas 1999). The southern populations in Oregon tended to be larger (i.e., several hundred to several thousand plants) and have larger and more reproductive plants than northern populations (Kaye 2000). In British Columbia, the largest population is 63 plants (Penny and Douglas 1999).

Habitat trends

The forests of the Pacific Northwest have become increasingly fragmented due to past logging practices. A high proportion of the mature to old forest in the Chilliwack forest district have been converted to young forest, disturbing natural conditions for tall bugbane. Initially, plants respond favourably after logging (clearcuts), but there are several risks to its continued persistence following the initial disturbance.

Threats

Population threats

Populations are small, and sporadically distributed over the landscape. Small populations are susceptible to low genetic diversity and imminent extirpation. In addition, tall bugbane is relatively much less attractive to pollinators than other flowering plants, and therefore, receives less visits, and has less reproductive success. Further limiting this species is the lack of a specialized seed dispersal mechanism. Due to this species' reproductive limitations, colonization into new sites or recolonization into former sites may be limited.

Habitat threats

The main threats to this species are forest harvesting, road construction, and lack of reproductive potential and recruitment (Penny and Douglas 1999; Kaye 2000). This species has been found in both mature forest and clearcuts, but it likely naturally grows in mature to old forest with canopy gaps (Kaye and Kirkland 1994). Clearcuts can provide the necessary conditions for seedling establishment, but the early stages of forest growth may overcome the plants due to intense competition. Thus, although tall bugbane responds favourably to removal of the forest canopy (Kaye and Kirkland 1999), the longer term impacts are unknown.

Plants may also grow on road cuts due to the favourable conditions for seedling germination but these plants may be threatened by roadside maintenance activities such as mowing and spraying which could kill adult plants, reduce seed production, or cause mortality of new seedlings (Kaye and Kirkland 1999).

Tall bugbane has reproductive limitations that make colonization into new sites difficult. It is relatively much less attractive to pollinators than other flowering plants, and lacks any effective seed dispersal mechanism.

Other potential threats include competition with invasive species.

Legal Protection and Habitat Conservation

There is currently no legislation that specifically protects tall bugbane in British Columbia. None of the populations are found in protected areas. However, one population on Vedder Mountain is partially protected within a small wildlife tree retention area and a visual landscape reserve.

Old growth management areas are unlikely to be located in the appropriate locations to meet the needs of this species. Riparian reserves will likewise not be important in protecting this species. This species does not typically grow along watercourses.

Identified Wildlife Provisions

Wildlife habitat area

Goal

Maintain the population and provide adequate space for population to persist as well as maintain a seed source for colonization or recolonization into nearby suitable habitat.

Feature

Establish WHAs at known or historical populations. A population is considered to be a cluster of individuals that are likely interbreeding, that is, they are not separated by any barrier that would restrict reproduction. Large distances could be a barrier, so populations are generally defined by polygons with a radius of no more than 500 m.

Size

Typically between 20 and 40 ha but will depend on site-specific conditions such as size of the population and area covered by population.

Design

The WHA should include a core area and a management zone. The core area is defined using the perimeter of the population plus a 30–50 m band surrounding the population. The management zone should be 150–200 m depending on site-specific characteristics but should be large enough to

preserve the ambient conditions and be windfirm. In some cases a wider management zone may be required on the upslope side of the population to maintain hydrological conditions.

General wildlife measure

Goals

1. Prevent direct mortality from road construction or maintenance activities.
2. Maintain core area as suitable habitat to allow population stability or growth.
3. Maintain microclimatic conditions (i.e., light conditions, soil moisture).
4. Minimize introduction and spread of invasive species.
5. Maintain the diverse stand structural components (e.g., *Acer* spp., canopy gaps).
6. Maintain an open canopy.
7. Maintain hydrological characteristics of core area.

Measures

Access

- Do not construct roads, trails, or stream crossings, particularly upslope of the population.
- Rehabilitate temporary access structures where possible.
- Where roads are determined to be necessary or already exist within WHA, ensure road maintenance practices do not damage or kill plants (i.e., do not mow plants) and use methods to prevent spread of invasive species (i.e., use control measures and seed with native species).

Harvesting and silviculture

- Do not harvest within core area except for treatments aimed at maintaining or improving stand characteristics for this species.
- Use partial harvesting systems in the management zone that maintain 60% basal stem area. Remove 40% basal stem area in small openings with a minimum of only a few crowns per gap.
- Retain *Acer* species, particularly *Acer macrophyllum*. Retain at least 20–30% from inventory distribution.

- Do not salvage unless it can be done without disturbing important structural elements (e.g., *Acer* species).
- Include deciduous species specifically *Acer* species, in the Free Growing standards.
- Use stand tending activities to promote canopy gaps around identified individuals of tall bugbane.

Pesticides

- Do not use pesticides.

Recreation

- Do not develop recreational trails, facilities, or structures within core area.

Additional Management Considerations

Avoid seeding with non-native species within the stand in which the WHA is found.

Avoid foliar or broadcast spraying of herbicides within the stand in which the WHA is found.

Promote persistence of deciduous species, in particular *Acer*, during stand tending activities.

Information Needs

1. Baseline biological and ecological data on tall bugbane in British Columbia.
2. Response of populations of tall bugbane to different logging treatments (i.e., population structure, inflorescence production, and average reproductive plant size) following treatments (done on more southerly populations, but not on Canadian populations).
3. Long-term viability of tall bugbane in managed forests in British Columbia.

Cross References

Coastal Tailed Frog, Marbled Murrelet, Pacific Water Shrew

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Appendix 2e

Wildlife: Pacific (Coastal) Tailed Frog



ORDER – WILDLIFE HABITAT AREAS 2-511 to 2-513

This Order is given under the authority of sections 9(2) and 10(1) of the *Government Actions Regulation* (B.C. Reg. 582/2004) (GAR).

1. The delegated decision maker, being satisfied that
 - i. the following area contains habitat that is necessary to meet the habitat requirements for Pacific Tailed Frog (*Ascaphus truei*); and
 - ii. the habitat requires special management that is not otherwise provided for under GAR or another enactment;

orders that

- a) the areas shown in the map set out in the attached Schedule A (2-511 to 2-513) and contained in the wildlife habitat areas (WHAs) spatial layer stored in the Geographic Warehouse (WHSE_WILDLIFE_MANAGEMENT.WCP_WILDLIFE_HABITAT_AREA_POLY) are established as wildlife habitat areas for Pacific Tailed Frog. The centre point of the line on the attached Schedule A is what establishes the WHAs; and
- b) if there is a discrepancy between the areas shown in the map set out in the attached Schedule A and the WHA spatial layer stored in the Geographic Warehouse (WHSE_WILDLIFE_MANAGEMENT.WCP_WILDLIFE_HABITAT_AREA_POLY), the areas as detailed in the WHA spatial layer will take precedent.

2. The delegated decision maker, being satisfied that
 - i. the general wildlife measures (GWMs) described below are necessary to protect and conserve the habitat of Pacific Tailed Frog; and
 - ii. GAR or another enactment does not otherwise provide for that protection or conservation;

orders that

- a) the GWMs outlined in Schedule 1 are established for WHAs 2-511 to 2-513

3. Pursuant to section 7(3) of the *Forest Planning and Practices Regulation* a person required to prepare a forest stewardship plan is exempt from the obligation to prepare results or strategies in relation to the objective set out in section 7(1) of the *Forest Planning and Practices Regulation* for Pacific Tailed Frog in the Chilliwack Natural Resource District.

Definitions:

Words and expressions not defined in this Order have the meaning given to them in the *Forest and Range Practices Act* and the regulations made under it, unless context indicates otherwise.

Schedule 1 – General Wildlife Measures

Access

1. Do not construct roads, trails, landings or stream crossings within the core area or management area.

Timber Harvesting

2. No timber harvesting is permitted.
3. GWM 2 does not apply if:
 - a. it is necessary to create guyline tiebacks for timber harvesting adjacent to a WHA boundary;
 - b. trees felled in accordance with GWM 3 a) are retained on-site to function as coarse woody debris, unless the felled tree poses a forest health risk; or
 - c. cutting of trees is for the purposes of traditional and cultural activities, as authorized under a Free Use Permit.
4. GWM 2 does not apply to the management area if:
 - a. a minimum of 70% basal area is retained;
 - b. all high value wildlife trees are retained; and
 - c. timber harvesting is conducted in a manner that minimizes potential for future windthrow.
5. No falling or yarding across streams is permitted.
6. No salvage activities are permitted.

Range

7. Limit shrub use by livestock to no more than 10% of the current year's growth of shrubs.
8. No livestock attractants are permitted.
9. No water developments are to be constructed or located.

Pesticide

10. No pesticide use is permitted, except for:
 - a. using *Bacillus thuringiensis var kurstaki* for the control of western spruce budworm;
 - b. using beetle pheromones for the control of bark beetles; and
 - c. using herbicides to control invasive plants or noxious weeds, if applied by:
 - i. stem injection, cut and paint, foliar wipe or other direct plant application;or

- ii. spot spraying individual plants or a cluster of plants if direct plant application is not practicable.

Recreation

- 11. Do not develop sites, trails, facilities or structures for recreational purposes.



Signed this 1st day of April, 2014

Heather MacKnight, Regional Executive Director, South Coast Region
Ministry of Forests, Lands and Natural Resource Operations

Appendix 1:

The following information is provided by the Ministry of Forests, Lands & Natural Resource Operations (FLNR) and the Ministry of Environment as background information and support to the Order establishing WHAs 2-511, 2-512, 2-513. This appendix is not part of the Order.

1. Activities to which the Order does not apply: Section 2(2) of the Government Actions Regulation states

An Order under any of sections 5 to 15 does not apply in respect of

- (a) any of the following entered into before the Order takes effect:

- (i) a cutting permit;

- (ii) a road permit;

- (iii) a timber sale licence that does not provide for cutting permits;

- (iv) a forestry licence to cut issued by a timber sales manager under section 47.6 (3) of the *Forest Act*;

- (v) subject to subsection (3), a minor tenure,

- (b) a declared area,

- (c) areas described in section 196 (1) of the Act, and

- (d) areas referred to in section 110 of the *Forest Planning and Practices Regulation*.

2. Authority to consider an exemption from these GWMs is provided in Section 92(1) of the *Forest Planning and Practices Regulation*, section 79(1) of the *Woodlot Licenses Planning and Practices Regulation* and section 36(3) of the *Range Planning and Practices Regulation*. An exemption may be provided if the Minister's delegate is satisfied that the intent of the GWM will be achieved despite the activity, or that compliance with the provision is not practicable, given the circumstances or conditions applicable to a particular area.

An exemption application should be submitted to the Minister's delegate with a rationale describing the nature of the problem and options to integrate Pacific Tailed Frog habitat conservation with proposed forest and/or range practices. This submission will assist in timely consideration of the matter, and will inform the conditions, if any, of the exemption that may be granted prior to commencement of activities. Upon receipt of a complete exemption application, a determination will normally be made within 14 days of arrival at the FLNR Regional office. Incomplete packages will be returned to the proponent for re-submission. A template for exemption requests is available at: <http://www.env.gov.bc.ca/wld/frpa/index.html>

3. Where an exemption is provided to the requirements of GWM 1, consideration may be given to adding the following condition(s) to the approval of the exemption:
 - a. Use of clear span bridges or bottomless culverts for any required stream crossings
 - b. Rehabilitation of sites where temporary access structures were installed.
4. The intent of GWM 1 is to minimize impacts to Pacific Tailed Frog in-stream riparian habitats. The location, type of crossing, mitigation measures during construction, and short and long-term sediment control on roads should all be considered when submitting

exemption requests to the Director of Resource Management, South Coast Region for road construction within the WHA. It is recommended that these factors also be taken into consideration when constructing roads adjacent to the WHA. If practicable, stream crossings should be constructed downstream of the WHA.

5. GWM 1 does not apply to road maintenance, road deactivation, brushing or clearing on existing permitted roads within the WHA. These activities should be carried out in a manner that will not result in a material adverse impact on the WHA.
6. Regarding GWM 4, the objective of partial harvest in the management area should be to create or maintain old forest characteristics such as large diameter trees, multi-layered canopies, snags and coarse woody debris.
7. Regarding GWM 4(b), where safety permits the intent is to retain all high value wildlife trees in the management area, as defined in Table 1 (*from* Provincial Wildlife Tree Policy and Management Recommendations, 2000).

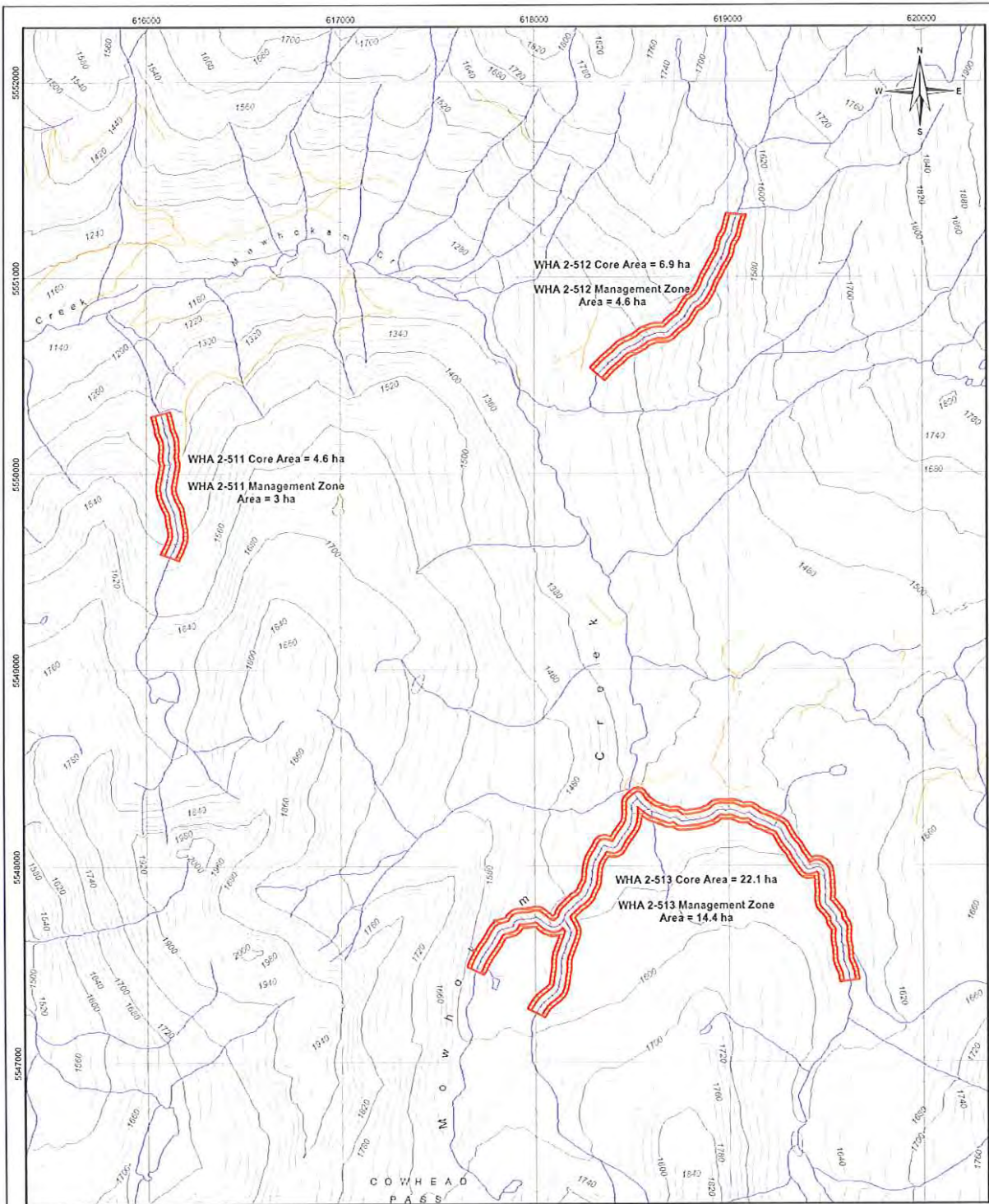
Table 1: Wildlife tree characteristics

Wildlife Tree Value	Characteristics
<p>HIGH</p> <p>A high-value wildlife tree has at least two of the characteristics listed in the adjacent column.</p>	<ul style="list-style-type: none"> • Internal decay (heart rot or natural/ excavated cavities present) • Crevices present (loose bark or cracks suitable for bats) • Large brooms present • Active or recent wildlife use • Current insect infestation • Tree structure suitable for wildlife use (e.g., large nest, hunting perch, bear den, etc.) • Largest trees on site (height and/or diameter) and/or veterans • Locally important wildlife tree species
<p>MEDIUM</p>	<ul style="list-style-type: none"> • Large, stable trees that will likely develop two or more of the above attributes for High
<p>LOW</p>	<ul style="list-style-type: none"> • Trees not covered by High or Medium

8. Regarding GWM 4(c) the intent is to minimize the risk of windthrow occurring within a WHA, particularly in the core area. FLNR recommends that any windthrow assessment follows those guidelines as prescribed under the 1994 Windthrow Handbook for BC Forests (Research Program Working Paper 9401). In addition, windthrow assessment practitioners should be familiar with the windthrow assessment course through FLNR. <http://www.for.gov.bc.ca/hfp/training/00015/resources.html>

9. The delegated decision maker may require fencing to be established along a WHA boundary to maintain riparian forest and structural elements within Pacific Tailed Frog habitat. Should it be determined that fencing is required, FLNR will work collaboratively with the range tenure holder to explore opportunities for funding assistance and to determine areas of responsibility for fence construction and maintenance.

10. These GWMs do not apply to persons who must comply with the *Worker's Compensation Act* and the regulations under that Act (e.g. danger tree felling as per OH&S Regulation Part 26). Where a GWM cannot be achieved due to a safety concern, a person should consider developing a rationale related to the safety issue. Where possible, offset retention should be considered elsewhere when meeting the safety concern reduces retention. Consistent with section 2(3) of the *Forest Planning and Practices Regulation*, exemptions from these GWMs are not required to meet safety requirements).





**Schedule A
Wildlife Habitat Area
WHA Numbers 2-511 to 2-513**

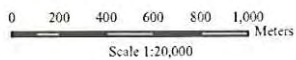
Original Signed April 1, 2014

Heather MacKnight, Regional Executive Director
South Coast Region
Ministry of Forests, Lands
and Natural Resource Operations

For more information contact
Habitat Management Section
Fish, Wildlife and Habitat Management Branch
Ministry of Forests, Lands
and Natural Resource Operations
250-356-7719

Legend

-  WHA - Core Area
-  WHA - Management Zone



Contour Interval 20 m
Projection UTM Zone 10
Datum NAD 83

Map Produced by the
Knowledge Management Branch
Ministry of Environment

COASTAL TAILED FROG

Ascaphus truei

Original¹ prepared by Agi Mallory

Species Information

Taxonomy

Phylogenetic studies have determined that tailed frogs belong in their own monotypic family, Ascaphidae (Green et al. 1989; Jamieson et al. 1993). Recent phylogeographic analysis has determined that coastal and inland assemblages of the tailed frog are sufficiently divergent as to warrant designation as two distinct species: *Ascaphus truei* (coastal) and *Ascaphus montanus* (Rocky Mountain) (Ritland et al. 2000; Nielson et al. 2001). The divergence of coastal and inland populations is likely attributable to isolation in refugia in response to the rise of the Cascade Mountains during the late Miocene to early Pliocene (Nielson et al. 2001).

The Coastal Tailed Frog and Rocky Mountain Tailed Frog are the only members of the family Ascaphidae and are considered the most primitive frogs in the world, representing the basal lineage of the anurans (Nielson et al. 2001).

Description

Tailed frogs have unique morphological adaptations to life in fast-flowing mountain streams. They are the only frog species in North America that breed in cold mountain streams. Adults and juveniles are small (2.2–5.1 cm) with a large head, a vertical pupil, and broad and flattened outer hind toes. They lack tympana (ear membranes) and the ability to vocalize, presumably adaptations to the constant sound of rushing water. The species is commonly known as the tailed frog because males have a short, conical “tail” with which to inseminate females. Adults have a grainy skin that can vary in colour from tan, to chocolate brown, to olive green (Metter 1964; L.A. Dupuis, pers. comm.); fine black speckling generally occurs on paler individuals. There is often a distinct

copper bar or triangle between the eyes and snout, with green undertones (Metter 1964).

Tadpoles are roughly 11 mm in length upon hatching, and can reach up to 65 mm long prior to metamorphosis (Brown 1990). They possess a wide flattened oral disc modified into a suction mouth for clinging to rocks in swift currents and grazing periphyton (Metter 1964, 1967; Nussbaum et al. 1983), a ventrally flattened body, and a laterally compressed tail bordered by a low dorsal fin. They are black or light brownish-grey, often with fine black speckling; lighter flecks may or may not be present (L.A. Dupuis, pers. comm.). The tadpoles usually possess a white dot (ocellus) on the tip of the tail and often have a distinct copper-coloured bar or triangle between the eyes and snout. Hatchlings lack pigmentation, and are most easily characterized by the large, conspicuous yolk sac in the abdomen.

Distribution

Global

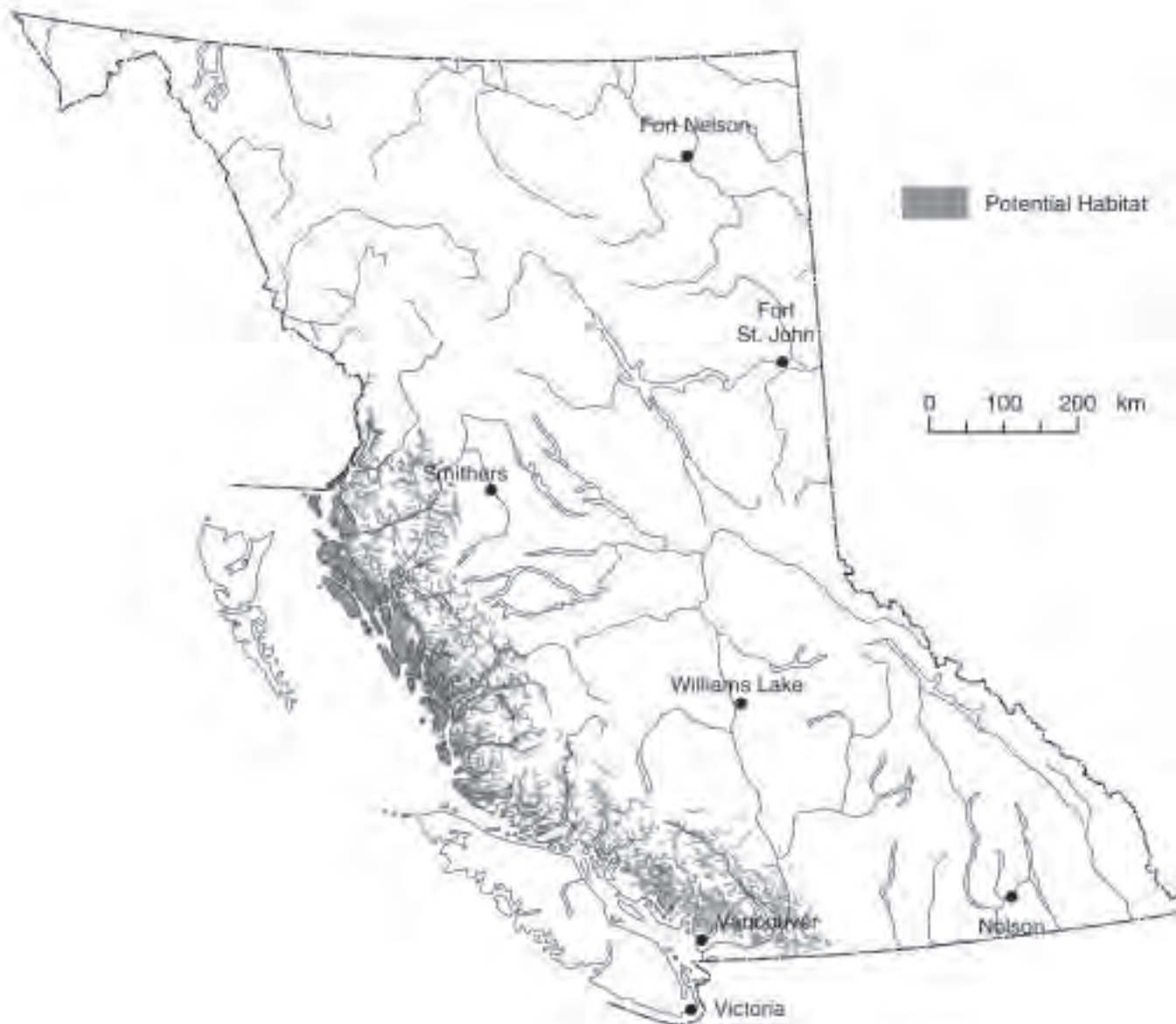
The Coastal Tailed Frog occurs from northwestern California to Portland Canal and Nass River, north of Prince Rupert, British Columbia throughout the temperate Coast Mountains (Corkran and Thoms 1996; Dupuis and Bunnell 1997).

British Columbia

In British Columbia, the Coastal Tailed Frog is restricted to cool permanent mountain streams within the windward and leeward drainages of the Coast Mountains. The distribution extends from the Lower Mainland in the Fraser Basin to Portland Canal and the Nass River on the north coast (Dupuis and Bunnell 1997; Dupuis et al. 2000). Occurrences become scattered and tadpole densities decrease

¹ Volume 1 account prepared by L. Dupuis.

Coastal Tailed Frog (*Ascaphus truei*)



Note: This map represents a broad view of the distribution of potential habitat used by this species. The map is based on several ecosystem classifications (Ecoregion, Biogeoclimatic and Broad Ecosystem Inventory) as well as current knowledge of the species' habitat preferences. This species may or may not occur in all areas indicated.

north of latitude 54° N. The most westerly occurrences are from islands on the mid- and northern coast of British Columbia, and from Namu and Boswell Inlet in the Hecate Lowlands (Dupuis et al. 2000). The most easterly occurrences are from the Cayoosh Ranges between Pemberton and Lillooet, Cathedral Provincial Park, south of Princeton, and Penticton (Dupuis et al. 2000; Gyug 2000). In the eastern portion of its range, cold creek temperatures limit distribution (Dupuis and Friele 2003).

Forest regions and districts

Coast: Campbell River (mainland), Chilliwack, North Coast, North Island (mainland), Squamish, Sunshine Coast

Northern Interior: Kalum, Skeena Stikine

Southern Interior: Cascades, Okanagan Shuswap (Penticton)

Ecoprovinces and ecosections

COM: CPR, EPR, HEL, KIM, KIR, NAM, NPR, NWC, OUF, SBR, SPR

GED: FRL, GEL

SOI: HOR, LPR, OKR, PAR, SCR, STU

Biogeoclimatic units

AT: p

CWH: dm, ds1, ds2, ms1, ms2, vh1, vh2, vm, vm1, vm2, wm, ws1, ws2, xm1

ESSF: dc2, mw, wv, xc

ICH: mc2

IDF: dk2, ww, xh1

MH: mm1, mm2

MS: dm2

Broad ecosystem units

CB, CR, FS, RR, RS, SM, SR, YB

CH, CW, FR, HS, MF – on south-facing slopes only

AV, RR, WR, (SS in IDFdk2, IDFww)

SF (into MSdm2 in OKR, STU)

Elevation

From sea level to 2140 m

Life History

Diet and foraging behaviour

Adults and juveniles forage primarily at night along the creek on a variety of items, including spiders and other terrestrial arthropods such as ticks, mites, collembolans (snow fleas), and various insects as well as snails (Metter 1964). Unlike most frogs and toads, tailed frogs do not have their tongue attached at the front of their mouth and therefore lack the ability to flip it out to catch prey (Green and Campbell 1984).

Tailed frog tadpoles are primary consumers that feed largely on diatoms that they scrape from submerged rocks (Metter 1964; Bury and Corn 1988). Other components of their diet include conifer pollen and small quantities of filamentous algae. In some streams, tailed frog tadpoles may function as the dominant herbivore (Lamberti et al. 1992).

Reproduction

Tailed frogs are the longest lived anuran species (15–20 years), and have the longest larval period and longest time to sexual maturity of all North American frogs (Brown 1975, 1989). They reach sexual maturity at 8 or 9 years of age (Daugherty and Sheldon 1982). Courtship takes place in the water in early fall (September–October). Tailed frogs are among the few frog species worldwide with internal fertilization (Green and Campbell 1984). The sperm stays viable in the female's oviducts until egg laying in June or early July. Each female produces a double strand of 44–85 colourless, pea-sized eggs that she attaches to the underside of a large rock or boulder in the stream in late summer (Metter 1964; Nussbaum et al. 1983). Although eggs are difficult to find, previous studies have shown that eggs are generally found close to headwaters (Brown 1975; Adams 1993).

The embryos emerge approximately 6 weeks after the eggs are deposited. They feed on a yolk sac which sustains them through the winter in the natal pool until their suckorial mouth is fully developed, after which they become more mobile (Metter 1964; Brown 1975). The tadpole stage lasts between 2 to 4 years prior to metamorphosis (Metter 1964; Brown 1990). However, 1-year larval cycles have

been observed for the Coastal Tailed Frog in northern California (Wallace and Diller 1998). Variation in the age at metamorphosis appears to reflect differences in climatic conditions throughout the species range (Bury and Adams 1999).

Home range

Home range is not known. A study on age-specific movement patterns of Rocky Mountain Tailed Frogs found that adults remain closely associated with their natal stream throughout their lives, often not moving more than 20 m per year and between years (Daugherty and Sheldon 1982). In the Coast Range, adults have been reported several hundred metres from a stream's edge during wet weather (Bury and Corn 1988; Dupuis et al. 1995; Gomez and Anthony 1996; Wahbe et al. 2000). Climatic conditions likely favourable for tailed frogs (e.g., high humidity, extended periods of rain) along the coast may enable adults to occupy larger home ranges or move longer distances.

Movements and dispersal

Data on movement and dispersal of Coastal Tailed Frogs for all life history stages are limited. Tadpoles are relatively sedentary but movements of up to 65 m have been recorded in old-growth streams in the Squamish area (Wahbe 1996). Given that eggs are generally deposited in the headwaters near the source of the stream (Brown 1975; Adams 1993), larval movement is thought to be primarily downstream (Wahbe et al. 2000). Tadpoles can be either nocturnal or diurnal, and may alter their behaviour to avoid detection by predators such as the Coast Giant Salamander (Feminella and Hawkins 1994).

Adults generally remain close to stream banks, and may move upstream either for refuge during the summer months or to lay eggs. A recent study in the Chilliwack Valley found Coastal Tailed Frogs in mature forests primarily within 5 m of the streamside, with a maximum distance of 45 m (Matsuda 2001). This study showed that, in clearcut sites, a higher proportion of frogs were caught at distances >45 m away, suggesting that frogs move beyond riparian zones in disturbed habitats when climatic conditions are favourable. A recent study in the

Merritt area found only adult males or immature females on streams without larvae during September, which indicates that adult females are less likely to disperse during the breeding season (Gyug 2000).

Some evidence shows that newly metamorphosed tailed frogs represent the life history stage that migrates farthest away from the stream. Preliminary results from movement studies in the Squamish area found newly metamorphosed tailed frogs 100 m from the nearest stream during the fall (Wahbe et al. 2000). Bury and Corn (1987, 1988) also captured numerous recently metamorphosed tailed frogs in pitfall traps set in forested stands, in the fall.

Habitat

Structural stage

6: mature forest (100–140 years)

7: old forest (>140 years)

Important habitats and habitat features

The presence of intrusive or metamorphic bedrock formations, moderate annual rainfall with a relatively high proportion of it occurring during the summer, and watersheds with low or moderate previous levels of harvest appear to be large-scale regional features in predicting the presence of *Ascaphus* (Wilkins and Peterson 2000).

Terrestrial

Little work has been done on post-metamorphic and adult habitat associations. Coastal Tailed Frogs are more prone to desiccation than most anuran species due to their dependence on vascularized skin for respiration (Claussen 1973b).

Forested riparian areas can benefit tailed frog larvae by moderating stream and ambient temperatures. Forested buffers also help to maintain bank stability and channel characteristics (Kelsey 1995; Dupuis and Friele 1996; Dupuis and Steventon 1999).

Aquatic

The Coastal Tailed Frog inhabits mountain streams with step-pool morphologies, and overall gradients that are not too low or excessively steep (Dupuis

et al. 2000). Larvae typically occur in creeks draining basins <50 km² but abundance is greatest in basins <10 km² (Dupuis and Friele 2003). Step-pools of cool, permanent streams adjacent to old forest with significant understorey are most suitable for this species. The species will also inhabit pool-riffle habitats characteristic of Coast Giant Salamander and fish-bearing streams.

Due to a long larval development period, tadpoles require stable perennial streams. Stable mountain streams are characterized by regularly spaced pools and interlocked cobble/boulder (or wood) steps that withstand moderate floods and sediment pulses (Chin 1998). Creeks composed of coarse substrates (boulders and large cobbles) and granodiorite bedrock that breaks down into coarse rock may maintain a higher density of tadpoles (Dupuis and Friele 1996; Diller and Wallace 1999). Coarse substrates allow for interstitial spaces that can serve as egg-laying and over-wintering sites, and cover in the event of flooding or small bedload movements. This is critical as tailed frogs have been shown to be negatively associated with the amount of fine sediments in streams (Bull and Carter 1996; Welsh and Ollivier 1998; Dupuis and Steventon 1999).

Tadpoles prefer smooth-surfaced substrates with a minimum diameter of 55 mm (Altig and Brodie 1972). Clear water is critical to allow for light penetration which stimulates algal growth, and also to minimize sedimentation which fills the interstitial spaces and results in scouring of periphyton from rocks. Tadpoles prefer rocks in turbulent water, and require interstitial spaces between rocks for both forage and cover (Altig and Brodie 1972). Juveniles and adults forage along the stream channel and in the riparian area and require riparian vegetation, boulders, and coarse woody debris for cover.

The creeks must remain cool throughout the summer as the species has a narrow temperature tolerance. However, at the northern limit of their range cold temperatures (<6°C) are considered limiting. The eggs require temperatures of 5–18°C to survive (Brown 1975). Stream temperatures and

food resources during the growing season are probably the most important environmental variables influencing tadpole growth (Brown 1990).

Conservation and Management

Status

The Coastal Tailed Frog is on the provincial *Blue List* in British Columbia. It is designated as a species of *Special Concern* in Canada (COSEWIC 2002).

Summary of ABI status in BC and adjacent jurisdictions (NatureServe Explorer 2002)

BC	CA	OR	WA	Canada	Global
S3S4	S2S3	S3	S4	N3N4	G4

Trends

Population trends

The Coastal Tailed Frog is moderately widespread and locally common. Populations are remarkably discrete within streams. There is no estimated population size for the Coastal Tailed Frog in British Columbia. A recent study showed that Coastal Tailed Frogs occurred in 40–60% of creeks surveyed on the coast of British Columbia, but only 10% near the northern limit of the range (Dupuis et al. 2000).

Habitat trends

Headwater streams have historically been viewed as less important than salmonid streams, and have received little or no protection in British Columbia. Suitable habitat for the Coastal Tailed Frog is declining in British Columbia, particularly in areas that have been clearcut at higher elevations. According to Environment Canada’s status report, about 75% of the tailed frog’s habitat in British Columbia has been at least partially developed (Environment Canada 2001).

Threats

Population threats

Factors that contribute to the vulnerability of Coastal Tailed Frog populations include its specialized habitat requirements, long larval period, potentially limited dispersal capabilities, low reproductive rates, and low tolerance of warm temperatures. Tadpoles are vulnerable to local extirpations or population declines from massive bedload (boulders, logs, and debris) movements in the creeks. Survival to the adult stage appears to be particularly low in second-growth forests, which are predominant in its range.

Habitat threats

Coastal Tailed Frogs are habitat specialists and occur only in suitable mountain streams. Due to these specialized habitat requirements, the Coastal Tailed Frog is vulnerable to habitat loss and alteration associated with logging. Logging impacts include stream exposure (e.g., Holtby 1988), increased sedimentation (e.g., Beschta 1978; Reid and Dunne 1984), bank erosion (e.g., Beschta 1978), and wind-fall, as well as reduced summer flow rates and increased peak discharges (Jones and Grant 1996). Sedimentation fills the spaces between rocks, reducing the availability of refuge sites used to escape floods, bedload movements, predation, and warm temperatures. Large-scale habitat disturbance, loss, and fragmentation through road building and timber harvesting are also likely to be detrimental to the species.

Livestock grazing may impact stream habitats where livestock grazing occurs.

Legal Protection and Habitat Conservation

The Coastal Tailed Frog is protected, in that it cannot be killed, collected or held in captivity without special permits, under the provincial *Wildlife Act*. If salmonid habitat exists downstream, some level of protection may be provided through the *Fisheries Act*.

Some populations occur in provincial parks and ecological reserves, such as Cypress Provincial Park, Pinecone Burke Provincial Park, Cathedral Provincial Park, Mount Elphinstone, Garibaldi Provincial Park, and the Kitlope Heritage Conservancy.

The results based code may provide protection through the establishment of old growth management areas (OGMAs), provided these overlap with known sites or suitable habitat. In addition, riparian management guidelines provide a measure of protection for riparian habitats, particularly for streams with game fish. However, since most populations of the Coastal Tailed Frog are found in small streams without fish, they are not protected by FRPA riparian management recommendations. These recommendations do not recommend retention of a riparian reserve zone on small streams where “game” fish are not present. However, they do recommend that forest practices in management zones adjacent to streams classified as S4–S6 (small fish or non fish bearing) be planned and implemented to meet riparian objectives. These objectives can include retaining sufficient vegetation to provide shade, reduce microclimatic changes, maintain bank stability and, where specified, may include objectives for wildlife, fish habitat, channel stability, and downstream water quality.

Finally, some additional protection of Coastal Tailed Frog habitat may come through the creation of special resource management zones (SRMZs) and protected areas for other species, such as the Spotted Owl, and Grizzly Bear.

Identified Wildlife Provisions

Sustainable resource management and planning recommendations

In landscapes or portions of landscapes documented to contain tailed frog populations, consider the following recommendations:

- ❖ Establish OGMAs to protect known tailed frog occurrences and suitable riparian habitats (see “Important habitats and habitat features”).

- ❖ Maximize connectivity of riparian habitats. Wherever possible, increase retention on streams classified as S5 or S6.
- ❖ Maintain water quality and flow characteristics (i.e., timing and quantity).
- ❖ Minimize use of chemical applications (e.g., dust-palliative polymer stabilizers and soil binders that can be sprayed within ditch lines).
- ❖ Avoid cross-stream yarding on suitable streams.

Wildlife habitat area

Goal

Maintain important streams and suitable breeding areas.

Feature

Establish WHAs on important streams and breeding areas. These streams/stream reaches are generally characterized by (1) presence of tadpoles, (2) year-round flow (perennial streams or gullies), (3) intermediate gradient (to allow formation of step-pool morphology), (4) coarse substrates, (5) stable channel beds, and (6) forest cover.

Size

Approximately 20 ha but will depend on site-specific factors including the number and length of stream reach included. Larger WHAs may be appropriate in watersheds with unstable terrain (class IV or V), or when WHAs are established to capture strategic metapopulations.

Design

A WHA should include at least two streams or stream reaches (e.g., S5 or S6) with evidence of presence of tailed frogs. The boundaries of a WHA should be designed to maintain stream conditions (substrate, temperature, macro-invertebrate, and algae communities). The WHA should include a 30 m core area and 20 m management zone on both sides or larger in areas of unstable terrain or to capture strategic metapopulations. Where slopes exceed 60%, the WHA should extend to the top of the inner gorge.

Where several streams with these characteristics occur, priority should be given to sites adjacent to

mature or old forest, sites with the greatest potential to establish and maintain mature forest connectivity, sites closest to the headwaters, or sites with high density of tadpoles. In general, WHAs should be established in watersheds with low or moderate levels of historical harvest and on several streams/stream reaches in a drainage to ensure that at least one will maintain a viable subpopulation (Sutherland 2000).

General wildlife measures

Goals

1. Maintain clean and stable cobble/boulder gravel substrates, natural step-pool channel morphology, stream temperatures within tolerance limits.
2. Maintain microclimatic, hydrological, and sedimentation regimes to (1) limit the frequency of occurrence of extreme discharge events, (2) limit the mortality rate of tailed frogs during floods, and (3) meet foraging and dispersal requirements of the adults and metamorphs.
3. Maintain riparian forest.
4. Maintain important structural elements (e.g., coarse woody debris).
5. Maintain water quality and naturally dispersed water flows.
6. Minimize risk of windthrow.

Measures

Access

- Minimize roads or stream crossings within the core area. When roads are determined to be necessary, minimize length and construct narrow roads to minimize site disturbance and reduce groundwater interception in the cutslope; use sediment-control measures in cut-and-fill slopes (e.g., grass-seeding, armouring ditch lines, and culvert outfalls); deactivate roads but minimize digging and disturbance to adjacent roadside habitat; minimize site disturbance during harvesting, especially in terrain polygons with high sediment transfer potential to natal streams; and fall and yard away from, or bridging, all other stream channels (ephemeral or perennial) within the WHA, to reduce channel disturbance and slash loading.

- Where stream crossings are required, ensure the type of crossing structure and any associated roads are designed and installed in a way that minimizes impacts to tailed frog instream and riparian habitats. Use temporary clear span bridges where practicable.

Harvesting and silviculture

- Do not harvest in the core area. Use partial harvesting systems in the management zone that maintain 70% basal area with the appropriate structure necessary to achieve the goals of the GWM.
- Where management zones exceed 20 m, develop a management plan that is consistent with the goals of the GWM.
- No salvage should be carried out.
- Avoid cross-stream yarding.
- Do not use chemical applications (e.g., dust-palliative polymer stabilizers and soil binders that can be sprayed within ditch lines).

Pesticides

- Do not use pesticides.

Range

- Where livestock grazing occurs, follow recommended target conditions for range use in stream riparian areas. Fencing may be required by the statutory decision maker to achieve goals.

Additional Management Considerations

Wherever possible and practicable, augment management zone using wildlife tree retention areas.

Manage stream reaches adjacent to WHA according to riparian management recommendations.

Prevent fish introductions and rechannelization of areas supporting tailed frog populations.

Maintain slash-free headwater creeks and forested riparian buffers, especially within fragmented areas.

Information Needs

1. Age-specific movement and dispersal patterns and home range.

2. Demographic responses of Coastal Tailed Frogs to habitat change (e.g., age-class distribution, reproductive success, movement, and dispersal).
3. Opportunity to use variable retention and partial harvesting without degrading habitat suitability.

Cross References

Coastal Giant Salamander, Marbled Murrelet, Pacific Water Shrew

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Appendix 2f

Wildlife: Spotted Owl

ORDER – WILDLIFE HABITAT AREAS 2-494 to 2-510

This order is given under the authority of sections 9(2) and 10(1) of the *Government Actions Regulation* (B.C. Reg. 582/2004) (GAR).

1. The Deputy Minister of Natural Resource Operations, being satisfied that
 - i. the following area contains habitat that is necessary to meet the habitat requirements for Spotted Owl (*Strix occidentalis*); and
 - ii. the habitat requires special management that is not otherwise provided for under GAR or another enactment;

orders that

- a) this order cancels and replaces the order established on June 13, 2006, entitled “ORDER – WILDLIFE HABITAT AREA #2-317, 2-318 and 2-319”;
- b) this order cancels and replaces a portion of the order (that portion specific to 3-037, 3-038, 3-039) established June 13, 2006, entitled “ORDER – WILDLIFE HABITAT AREA #3-034 to 3-039”;
- c) this order cancels and replaces the order established on November 6, 2006, entitled “ORDER – AMENDMENT TO WILDLIFE HABITAT AREA 3-037”;
- d) the areas shown in the map set out in the attached Schedule A (2-494 to 2-510) and contained in the wildlife habitat areas (WHAs) spatial layer stored in the Geographic Warehouse (WHSE_WILDLIFE_MANAGEMENT.WCP_WILDLIFE_HABITAT_AREA_POLY) are established as wildlife habitat areas for Spotted Owl (including Long Term Owl Habitat Area (LTOHA), and Managed Future Habitat Areas (MFHA) boundaries, as defined in the Feature Notes). The centre point of the line on the attached Schedule A is what establishes the WHAs; and
- e) if there is a discrepancy between the areas shown in the map set out in the attached Schedule A and the WHA spatial layer stored in the Geographic Warehouse (WHSE_WILDLIFE_MANAGEMENT.WCP_WILDLIFE_HABITAT_AREA_POLY), the areas as detailed in the WHA spatial layer will take precedent.

2. The Deputy Minister of Natural Resource Operations, being satisfied that
 - i. the general wildlife measures (GWMs) described below are necessary to protect and conserve the habitat of Spotted Owl; and
 - ii. GAR or another enactment does not otherwise provide for that protection or conservation;

orders that

- a) the GWMs outlined in Schedule 1 are established for WHAs 2-494 to 2-510
3. Pursuant to section 7(2) of the *Forest Planning and Practices Regulation* a person required to prepare a forest stewardship plan is exempt from the obligation to prepare results or strategies in relation to the objective set out in section 7(1) of the *Forest Planning and Practices Regulation* for Spotted Owl in the Chilliwack Forest District.
 4. The GWMs outlined in Schedule 1 do not apply for the purposes of exploration, development and production activities when these activities have been authorized for the purpose of

subsurface resource exploration, development or production by the *Mineral Tenure Act*, the *Coal Act*, or the *Geothermal Resources Act*.

Definitions:

Words and expressions not defined in this order have the meaning given to them in the *Forest and Range Practices Act* (FRPA) and the regulations made under it, unless context indicates otherwise.

drier ecosystems means the following biogeoclimatic subzones or variants: CWHds1, CWHms1, CWHms2, MHmm2, ESSFmw and IDFww.

large coarse woody debris (CWD) means fallen trees or logs (non self-supporting and a diameter at the small end >7.5cm) at an angle <45 degrees to the ground surface, stumps, or fallen large branches (>20cm in diameter).

large wildlife trees means wildlife trees, in wildlife tree classes 2 through 7-8, that are typically >75 cm dbh in wetter ecosystems; and wildlife trees, in wildlife tree classes 2 through 7-8, that are typically >50 cm dbh in drier ecosystems.

long term owl habitat area (LTOHA) means the defined areas within a WHA that are to function as current or future spotted owl habitat.

managed future habitat area (MFHA) means the defined areas within a WHA that are primarily available for timber harvesting opportunities while retaining structural attributes to maintain options for all or portions of the MFHA to become future spotted owl habitat and, if necessary, LTOHA.

nest and critical roost site reserves means a forested and conserved area, normally 80 ha of spotted owl habitat, surrounding areas that are known by the Ministry of Environment (MOE) and Ministry of Natural Resource Operations and identified by the Director, Resource Management, South Coast Region to be used for nesting and roosting by spotted owls, or those areas identified by *Forest Act* agreement holders during the course of conducting timber harvesting and road construction.

net benefit to spotted owl habitat means a stand treatment that within 20 years will create or enhance spotted owl habitat conditions by improving quality of habitat or accelerating the development of spotted owl habitat attributes.

no net loss of spotted owl habitat means that any primary forest activity occurring within LTOHA that causes a temporary or permanent loss of spotted owl habitat or habitat attributes associated with spotted owl habitat, is mitigated to provide a net benefit to spotted owls and spotted owl habitat within 20 years.

spotted owl habitat is defined in Section 2 of the document *Best Management Practices for Managing Spotted Owl Habitat: A component of the Spotted Owl Management Plan 2, Chilliwack and Squamish Forest Districts* dated July 7, 2009.

total area under prescription (TAUP) means the treatment area, timber extraction corridors, landings, natural non-productive area (e.g. rocky outcrops, slides, wetlands), wildlife tree retention areas, other reserves, and road rights-of-way but excludes the road prism (top of cut bank to toe of fill slope) of existing permanent roads.

treatment area means the area where tree removal occurs and excludes road rights-of-way (the road prism: top of cut bank to toe of fill slope), natural non-productive areas, wildlife tree retention areas and other reserves.

uniform forest stands means a forest stand lacking structural diversity where trees are of a similar age and uniform size (height and diameter), with no apparent secondary tree canopy layers.

wetter ecosystems means the following biogeoclimatic subzones or variants: CWHdm, CWHvm1, CWHvm2 and MHmm1.

Schedule 1 – General Wildlife Measures:

Access, timber harvesting and silviculture

1. Do not harvest timber or construct roads within WHA areas designated as Long Term Owl Habitat Areas (LTOHA) or Managed Future Habitat Areas (MFHA) except as provided in GWM 2 through 7.
2. GWM 1 does not apply to:
 - a) Teal-Jones block SQ1: at Sowaqua Creek, located within WHA 2-498, as engineered or designed in May 2009; and where the post harvest attributes to be maintained will be consistent with the *1997 Spotted Owl Management Plan* and the *1999 Spotted Owl Management Plan – Resource Management Plans*;
 - b) BC Timber Sales block DP101: at Depot Creek, located within WHA 2-495, as engineered or designed in May 2009 including in-block spur road construction, and provided harvesting is complete by September 30, 2014. Post harvest attributes to be maintained will be consistent with the *1997 Spotted Owl Management Plan* and the *1999 Spotted Owl Management Plan – Resource Management Plans*;
 - c) Tamihi Logging block 8710 and associated road construction: at Cantelon Creek, located within WHA 2-496, where up to 11 ha can be harvested as shown on the Tamihi map dated January 28, 2011; and where the post harvest attributes will be consistent with the *1997 Spotted Owl Management Plan* and the *1999 Spotted Owl Management Plan – Resource Management Plans*;
 - d) Tamihi Logging blocks 2009 to 2011, 2012A, 2013 to 2021 (13 in total), and associated road: at Ford Mountain and Post Creek, located within WHA 2-495, where up to 142.4 ha can be harvested as jointly agreed to in January 2011 between Tamihi Logging and Ministry of Natural Resource Operations. For all blocks, the post harvest attributes will be consistent with managed future habitat area as per GWM 5 in this order; and upon completion of harvesting, the block areas will be managed as LTOHA;

- e) Tamihi Logging blocks BS 213, BS214, BS215 and associated road: in Clear Creek located, within WHA 2-503, where up to 40 ha of the 47 ha proposed in several blocks (as per Tamihi map dated July 19, 2010) can be harvested provided that a minimum 150m buffer of mature forest is retained (as described in MOEs letter of July 30, 2010 and as shown on Map 1 attached to that letter); and where post harvest attributes will be consistent with managed future habitat area as per GWM 5 in this order. Once harvested, the block area will be managed as LTOHA;
- f) Tamihi Logging block SK4516 and associated road construction: in Silverhope Creek, located within WHA 2-496, where up to 24.4 ha can be harvested (as per Tamihi draft map dated July 19, 2010), and where post harvest attributes will be consistent with managed future habitat area as per GWM 5 in this order. After harvest the block area will be managed as LTOHA; and
- g) Tamihi Logging blocks in Karen Creek (unnamed) and associated road construction: located within WHA 2-498, where up to 44.4 ha can be harvested in several small blocks (maximum size 10 ha each) as jointly agreed between Tamihi Logging and Ministry of Natural Resource Operations in January 2011; and where post harvest attributes in all blocks will be consistent with managed future habitat area as per GWM 5 in this order. After harvest the block areas will be managed as LTOHA.

3. GWM 1 does not apply if:

- a) timber harvesting within the WHAs is necessary to create guyline tiebacks for timber harvesting provided that trees that fall within the LTOHA portion of the WHA boundary are retained on site to function as coarse woody debris;
- b) timber harvesting is for the purposes of traditional and cultural activities, as authorized under a Free Use Permit; or
- c) road maintenance, deactivation or brushing in the road right-of-way is required.

4. GWM1 does not apply where timber harvesting within LTOHA is designed to enhance or create spotted owl habitat if:

- a) timber harvesting results in a net benefit to spotted owl habitat;
- b) timber harvesting occurs outside of nest and critical roost site reserves;
- c) no greater than 40% of the stand basal area within the TAUP is harvested; of the stand basal area removed within the treatment area:
 - i. a minimum of 50% of the basal area is harvested as single stems or as small groups of trees that result in canopy gaps ≤ 50 square meters;
 - ii. no more than 25% of the basal area removed is from timber extraction corridors (e.g. linear features) and the maximum corridor width is 8 m; and
 - iii. no more than 25% of the basal area removed is from groups of trees that would result in canopy gaps between 51 and 300 square meters;
- d) in drier ecosystems a minimum average of 275 trees/ha >30 cm dbh are retained across the treatment area where tree retention density on each hectare of treatment area may vary between 240 to 310 trees >30 cm dbh;
- e) in wetter ecosystems a minimum average of 225 trees/ha >50 cm dbh are retained across the treatment area where tree retention density on each hectare of treatment area may vary between 200 to 250 trees >50 cm dbh;

- f) an average density of 100 large-diameter trees/ha are retained across the treatment area where large-diameter tree retention densities per hectare may vary between 50 and 150 trees/ha as follows:
 - i. in non-uniform forest stands, retained large-diameter trees are selected from the largest diameter 150 trees per hectare;
 - ii. in uniform forest stands, retained large-diameter trees are selected from the dominant and co-dominant canopy layer; and
 - iii. at least 10 large wildlife trees/ha, if present, are retained among the 100 largest diameter trees/ha;
- g) a minimum 10% of the TAUP is retained as untreated wildlife tree retention areas; and
- h) all pre-harvest coarse woody debris is retained, and post-harvest non-merchantable large coarse woody debris is recruited.

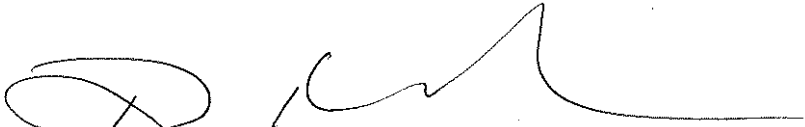
5. GWM 1 does not apply to timber harvesting within WHA areas designated as Managed Future Habitat Areas (MFHA) if:

- a) timber harvesting occurs outside of nest and critical roost site reserves;
- b) a minimum of 10% of the TAUP is retained as untreated wildlife tree retention areas;
- c) in drier ecosystems, a minimum average of 40 large-diameter trees/ha are retained across the TAUP as follows:
 - i. in non-uniform forest stands the large diameter trees are selected for retention from the diameter classes representing the 80 largest-diameter live trees/ha;
 - ii. in uniform forest stands the large-diameter trees are selected for retention from the dominant and co-dominant canopy layers;
 - iii. the number of trees retained per hectare may vary across the TAUP, however no point within the TAUP should be greater than 40 m from a retained tree;
 - iv. of the 40 large-diameter trees/ha, no more than 40% of those trees within the TAUP are retained within wildlife tree retention areas and other reserves; and
 - v. large-diameter trees are retained as single trees or groups of trees within the TAUP;
- d) in wetter ecosystems, a minimum average of 15 large-diameter trees/ha are retained across the TAUP as follows:
 - i. in non-uniform forest stands the large-diameter trees are selected for retention from the diameter classes representing the 30 largest-diameter live trees/ha;
 - ii. in uniform forest stands the large-diameter trees are selected for retention from the dominant and co-dominant canopy layers;
 - iii. the number of trees retained per hectare may vary across the TAUP, however, no point within the TAUP should be greater than 40 m from a retained tree;
 - iv. of the 15 large-diameter trees/ha, no more than 40% of those trees within the TAUP are retained within wildlife tree retention areas and other reserves; and
 - v. large-diameter trees are retained as single trees or groups of trees within the TAUP;
- e) post-harvest non-merchantable large coarse woody debris is retained over the treatment area to result in:
 - i. representative species and sizes of the pre-harvest large coarse woody debris;

- ii. a minimum average volume of 75 cubic meters/ha of large coarse woody debris; and
 - iii. where pre-harvest Western redcedar large coarse woody debris is present, a minimum average volume of 25 cubic meters/ha of Western redcedar large coarse woody debris if available, or all pre-harvest Western redcedar large coarse woody debris if the pre-harvest amount available is <25 cubic meters/ha, towards the GWM 5 (e) ii requirement; and
- f) early successional conifer species that are ecologically suitable for the site are planted with consideration for variable density planting.
6. GWM 1 does not apply to road construction within the WHA if:
- a) road construction activities occur outside of nest and critical roost site reserves;
 - b) there is no other practicable option for road construction in the LTOHA and the negative impacts of clearing road rights-of-way are offset so that there is no net loss to spotted owl habitat; and
 - c) road rights-of-way clearing widths within the LTOHA do not exceed the minimum clearing widths established under FPPR section 78.
7. GWM 1 does not apply to salvage in the MFHA if salvage activities:
- a) occur outside of nest and critical roost site reserves; and
 - b) follow the requirements in GWM 5(a) through (e).

Pesticides

8. Do not use pesticides in LTOHA, except for:
- a) the use of *Bacillus thuringiensis var kurstaki* for the control of western spruce budworm;
 - b) the use of beetle pheromones for the control of bark beetles; and
 - c) the application of herbicides for control of invasive plants or noxious weeds.



Signed this 1 day of March, 2011
Doug Konkin, Deputy Minister
Ministry of Natural Resource Operations

Appendix 1:

The following information is provided by the Ministry of Natural Resource Operations (MNRO) and Ministry of Environment (MoE) as background information and support to the order establishing Spotted Owl WHAs 2-494 to 2-510. This appendix is not part of the order.

1. These GWMs do not apply to persons that must comply with the *Worker's Compensation Act* and the regulations made under that Act (e.g. OH&S Regulation Part 26). Where a GWM cannot be achieved due to a safety concern, a person should consider developing a rationale related to the safety issue. Consistent with section 2(3) of the *Forest Planning and Practices Regulation*, exemptions from these GWMs are not required to meet safety requirements.
2. **Activities to which the order does not apply:** Section 2(2) of the *Government Actions Regulation* states
An order under any of sections 5 to 15 does not apply in respect of
 - (a) any of the following entered into before the order takes effect:
 - (i) a cutting permit;
 - (ii) a road permit;
 - (iii) a timber sale licence that does not provide for cutting permits;
 - (iv) a forestry licence to cut issued by a timber sales manager under section 47.6 (3) of the *Forest Act*;
 - (v) subject to subsection (3), a minor tenure,
 - (b) a declared area,
 - (c) areas described in section 196 (1) of the Act, and
 - (d) areas referred to in section 110 of the *Forest Planning and Practices Regulation*.
3. *Forest Act* agreement holders should be familiar with the document *Best Management Practices for Managing Spotted Owl Habitat: A component of the Spotted Owl Management Plan 2, Chilliwack and Squamish Forest Districts* dated July 7, 2009. This document was developed by the Best Management Practices Working Group and contains recommendations that are not directly reflected in this order, yet are still considered important for managing spotted owl habitat and should be considered by professionals when proposing activities in spotted owl WHAs. The document may be updated from time to time. Where a discrepancy exists between the BMPs and the GWMs, the latter takes precedence. The document is available here: <http://www.for.gov.bc.ca/ftp/DCK/external/!publish/SOMP/>
4. Authority to consider an exemption from these GWMs is provided in Section 92(1) of the *Forest Planning and Practices Regulation* and section 79(1) of the *Woodlot License Planning and Practices Regulation*. An exemption may be provided if the Minister's delegate is satisfied that the intent of the GWM will be achieved or that compliance with the provision is not practicable, given the circumstances or conditions applicable to a particular area.

An exemption application should be submitted to the Minister's delegate with a rationale describing the nature of the problem and options to integrate owl habitat conservation with proposed forest and/or range practices. This submission will assist in timely consideration of the matter, and will inform the conditions, if any, of the exemption that may be granted prior to

commencement of activities. Upon receipt of a complete exemption application, a determination will normally be handled within 14 calendar days of arrival at the MNRO Regional office. Incomplete packages will be returned to the proponent for resubmission. A template for exemption requests is available at: <http://www.env.gov.bc.ca/wld/frpa/index.html>

For GWM 1, exemptions would generally be considered when the proposed activities continue to meet the intent of the Spotted Owl Management Plan, as determined by the Ministry of Natural Resource Operations.

5. For the definition of large wildlife trees (as used in GWM 4(f)iii): see Figure 2 (classes 2 through 7-8) in *Best Management Practices for Managing Spotted Owl Habitat: A component of the Spotted Owl Management Plan 2, Chilliwack and Squamish Forest Districts* dated July 7, 2009.
6. For the LTOHA definition: The management goal is to achieve 100% spotted owl habitat conditions by conserving existing spotted owl habitats and creating additional spotted owl habitats or enhancing habitat to improve quality for foraging and/or nesting. Forestry activities within the LTOHA are only permitted with the purpose of enhancing and creating spotted owl habitat or protecting spotted owl habitat from catastrophic loss.
7. For the MFHA definition: The management goal is to allow for timber harvesting with the retention of structural attributes such as large diameter trees, snags, and large coarse woody debris to enable future recruitment as spotted owl habitat. The attributes retained are not normally present (in quality and quantity) in stands managed for timber on "normal" 60-100 year rotations. See also the section on MFHA in *Best Management Practices for Managing Spotted Owl Habitat: A component of the Spotted Owl Management Plan 2, Chilliwack and Squamish Forest Districts* dated July 7, 2009.
8. For GWM 2 (d), an agreement for mitigation harvesting at Ford Mountain and Post Creek was reached between Tamihi Logging and MNRO on January 27, 2011 where up to 142.4 ha may be harvested in 13 blocks. Most of the cutblocks have been engineered and mapped (see January 25/11 map), but it is recognized that there may be very minor amendments to these cutblock designs. A Table (dated January 27/11) referencing the mitigation plan also forms part of the agreement.
9. For GWM 2(f), it is understood that the Tamihi Logging block at Silverhope Creek is not yet engineered, and that the final design will not be the same as shown on the July 19, 2010 map; however the final block boundaries should reasonably lie within the draft map. In the event that road cannot be built to this 24.4 ha block in Silverhope Creek due to terrain stability restrictions, as assessed by a qualified professional, an equivalent area will be found in Karen Creek as jointly agreed between Tamihi Logging and Ministry of Natural Resource Operations in January 2011. This possibility is built into GWM 2(g) where the maximum allowable harvest at Karen Creek is recognized as up to 44.4 ha. This area is meant to address 2 separate agreements: 1) up to 20 ha in small cutblocks averaging about 5 ha each, which can proceed irrespective of Silverhope Creek; and 2) up to 24.4 ha in other small cutblocks which can only

proceed if terrain stability prohibits the Silverhope Creek block. If the second agreement is exercised the maximum opening size in Karen Creek is not to exceed 10 ha/block.

10. For GWM 2 exemptions specific to Tamihi Logging, an agreement to finalize mitigation was reached in January 2011, subject to First Nations consultation in respect of the blocks. If First Nations concerns preclude a mitigation block from going forward, it is agreed that alternate areas will be considered by way of normal FPPR section 92 exemptions.
11. The intent of GWM 4(b), 5(a), 6(a) and 7(a) is that *Forest Act* agreement holders contact the MNRO or MoE for locations of known nest and critical roost site reserves prior to the commencement of activities. In some cases agreement holders may, during the course of conducting timber harvesting and road construction, identify a nest or critical roost site; and if this occurs they must provide that information to the Director, Resource Management, South Coast. It must be noted that since these sites represent a 'sensitive occurrence' (masked by the BC Conservation Data Center (CDC)) they are protected from being distributed to the public. Proponents required to know of these locations may have to enter into a Confidentiality Agreement with MOE (and the BC Conservation Data Centre) before the location will be provided. There are times when the information won't be released because a planned activity will fall outside the critical nest or roost site, but this will be determined by the CDC upon reviewing the activity.
12. In GWM 4(f)(i) and (ii), and 5(c)(i) and (ii), and 5(d)(i) and (ii), retained trees should include any veteran trees present, and any trees exhibiting valuable habitat characteristics such as large, clustered or gnarled branches, or horizontal thickly moss-covered branches (e.g. wildlife trees from class 1).
13. In GWM 4(d), 4(e), 5(c) and 5(d), tree retention in general should consider:
 - a) on dry sites, Douglas-fir trees are very windfirm;
 - b) on wet sites, Western redcedar trees are considered to be more windfirm than hemlock and balsam fir because of crown characteristics and rooting habits;
 - c) stem taper may be an important factor affecting susceptibility to stem breakage;
 - d) the height-to-diameter ratio of dominant trees in even-aged stands has been found to be a good indicator of risk of stem breakage;
 - e) crown class alone is not a reliable predictor of windthrow hazard. There is some evidence to suggest that dominant, co-dominant, and veteran trees are less susceptible to windthrow than the intermediate and suppressed crown classes if they have been exposed to wind for a long time;
 - f) more information is available in the Windthrow Handbook for BC Forests, available here: <http://www.for.gov.bc.ca/hfd/pubs/Docs/Wp/Wp01.htm>
 - g) that some post harvest stem breakage is expected and acceptable since it will help create wildlife trees and coarse woody debris.
14. The intent of GWM 4 (h) is that pre-harvest coarse woody debris is retained on site as distributed across the treatment area. Coarse woody debris piled at roadside or landings has limited ecological value.

15. The intent of GWM 5 (c)(iii) and (d)(iii) is that if worker safety concerns prevent attaining the maximum tree spacing requirement of 80m, then an alternate approach is implemented to achieve the intent of the GWM. Operators should document the safety issue and how the intent of the GWM was achieved.
16. The intent of GWM 5 (e)(ii) and (iii) is to:
- a) improve the potential for restoring superior owl habitat through retention of large CWD that has a high component of fallen trees or logs >75cm in diameter and >5m in length in the wetter ecosystems; and a high component of fallen trees or logs >50cm in diameter and >5m in length in the drier ecosystems.
 - b) distribute large CWD throughout the treatment area as single pieces and/or small piles, using a variety of large CWD materials (e.g. fallen trees, logs, and large branches rather than just large branches). Logs should be processed at the stump so that non-merchantable large CWD can be left throughout the stand to avoid concentrating CWD accumulations at landings and roadsides.
 - c) not use fresh cut stumps to meet large CWD requirements where there are large fallen trees and other sources available. Fresh stumps should only be needed to meet the CWD requirements in second growth stands where alternate sources of large CWD are limited. Ideally, fresh stumps should only form a small portion of large CWD requirements.
 - d) follow best management practices on page 18 of the Best Management Practices document.
17. The intent of GWM 6 (b) is that offsets to the negative impacts of clearing road rights-of-way must be acceptable to the Director Resource Management, South Coast Region.
18. The intent of GWM 7 is to enable minor and major salvage in only the MFHA when it meets the conditions of this GWM. If a disturbance event (e.g. windthrow, fire, or forest health etc) occurs in treated MFHA which does not meet the conditions of this GWM, an exemption is required. Major salvage (operations that recover >100 cubic meters of forest products) within the LTOHA will only be considered on a site by site basis where damage within the LTOHA exceeds 30% of the stand volume; or where a natural disturbance caused by insects, disease, wildfire, windthrow or other catastrophic event results in degradation to the suitability of spotted owl habitat. Salvage proposals in the LTOHA will require an exemption. Proponents should not expect that all salvage applications in the LTOHA will be approved. It is not government's intention to accept repeated salvage requests over the same or similar area. Minor salvage (operations that recover <100 cubic meters of forest products) is not permitted in the LTOHA.
19. The Spotted Owl Management Plan 2 acknowledges the need for Adaptive Management. It is expected that the Best Management Practices document will need to adapt as the practices are implemented and tested, and as new information becomes available. For more on Adaptive Management please refer to section 7 of *Best Management Practices for Managing Spotted Owl Habitat: A component of the Spotted Owl Management Plan 2, Chilliwack and Squamish Forest Districts* dated July 7, 2009; and to the Forest Practices Branch website:

<http://www.for.gov.bc.ca/HFP/archives/amhome/AMDEFS.HTM>.

Where Adaptive Management is being considered for implementation at an operational scale, and differs from requirements in this order, the Adaptive Management proposal (that follows the 6 step process outlined in the above website) should be submitted as an exemption request. To acknowledge successful results from the adaptive management process, this order may be periodically updated.

20. Where an established WHA is subject to the operations of multiple *Forest Act* agreement holders, which may include areas under Timber Licence, Woodlot Licence, and First Nations Woodlands Licence, cooperation between licence holders should occur in order to ensure compliance with the general wildlife measures established by this order.

Replacement Designated Area Established for Spotted Owls, and Replacement Ministerial Order Made Preventing Most Logging and Road Construction

Effective March 3, 2022, through OiC 120/2022 (B.C. Reg. 54/2022), the provincial government established the Spotted Owl Designated Area No. 2 for the period ending February 28, 2023.

Effective the same date, the Minister of Forests, Lands, Natural Resource Operations and Rural Development made a related Ministerial Order M 61/2022, preventing most logging and road construction in the new Designated Area for the same period.

Background

Spotted Owl Designated Area No. 2 (“**Spotted Owl DA 2**”) replaces Spotted Owl Designated Area No. 1 (“**Spotted Owl DA 1**”).

Spotted Owl DA 1 was established on March 11, 2021 and expired February 28, 2022.

As reported in BC Forestry Legislation Update 2021:3, before the Province established DA 1, there were “...over 281,000 hectares of legally protected Spotted Owl habitat in the province of British Columbia, enough to support a population of 125 breeding pairs”.¹ According to the Federal government’s species profile, the northern spotted owl’s “historical population [i.e., pre-contact] of about 500 adult owls in Canada has been reduced to 19, and only 10 of these are in breeding pairs.”²

¹ Governments of Canada and British Columbia. News Release. February 25, 2021. *Canada and British Columbia launch development of a new Nature Agreement.*

² Government of Canada. Species Profile: Northern Spotted Owl. https://wildlife-species.canada.ca/species-risk-registry/species/speciesDetails_e.cfm?sid=33 (most recent survey 2007).

On February 25, 2021, the Governments of Canada and BC stated they were “launching the development of a new bilateral Nature Agreement to strengthen conservation province wide. As part of this effort, the two governments are announcing immediate action to support ongoing efforts for the recovery of the Spotted Owl...”³

Government Powers Regarding Designated Areas

Cabinet can establish Designated Areas under Part 13 of the *Forest Act* for a period of up to 10 years if it believes “...it is in the public interest [to do so]” (ss.169(1)(a) and (2) of the Act).

No compensation is payable to affected *Forest Act* agreement holders “during and in respect of the first 4-year period in which Crown land continues as a designated area”, but may be payable after that (ss.175.1 to 175.4 of the Act).

The Act empowers the Minister responsible for the *Forest Act* to:

1. **Suspend Existing Authorizations.** The Minister may suspend in whole or in part or vary existing cutting permits, road permits, TSLs, forest stewardship plans, management plans for TFLs, special use permits and other documents that relate to the Designated Area (s.170(2)(a));
2. **Direct No New Authorizations.** The Minister may direct persons who have a discretion under the *Forest Act*, FRPA or the Forest Practices Code to issue such documents not to issue them or to issue them with terms and conditions appropriate to take into account the Designated Area (s.170(2)(b)); and
3. **Attach Conditions.** The Minister may attach conditions to a *Forest Act* agreement or to a special use permit that relates to all or part of the Designated Area (s.171(1)).

The Spotted Owl Designated Areas

Following the 2021 bi-lateral News Release, the BC government established Spotted Owl DA 1.

DA 1 was set out on maps on file with Geo BC, Ministry of Forests, Lands, Natural Resource Operations and Rural Development (file name: Spotted_Owl_PT13_No1_20210201) (See attached maps).

Spotted Owl DA 2 is set out on maps on file with GeoBC, Ministry of Forests, Lands, Natural Resource Operations and Rural Development (file name: Spotted_Owl_PT13_No1_20210208) (See attached maps).

³ *Op cit.*, Footnote 1.

As can be seen from the attached maps, the location and area of Spotted Owl DA 2 is identical to that of Spotted Owl DA 1.

Although both Spotted Owl DA 1 and DA 2 are each for slightly less than one year, governments can and have in the past extended the periods of Designated Areas. In this case, the government has allowed Spotted Owl DA 1 to lapse and established Spotted Owl DA 2 almost immediately thereafter.

The Spotted Owl Ministerial Orders

Ministerial Order M61/2022 for DA 2 is identical to Ministerial Order M110/2021 for DA 1, except for its term.

With two exceptions, Ministerial Order M61/2022:

1. **Suspends Existing Permits.** The Order suspends the parts of all existing cutting permits, road permits, road use permits, timber sale licences, free use permits and licences to cut that are within Spotted Owl DA 2 and “pertain to a right to cut, damage or destroy standing timber”; and
2. **Directs No New Licences or Permits.** The Order directs that no new cutting permits, road permits, road use permits, timber sale licences, free use permits or licences to cut be issued to the extent to which they pertain to the cutting, damage or destruction of standing timber in Spotted Owl DA 2.

The two exceptions are:

1. **Free use permits** that are issued for a traditional and cultural activity or to a treaty first nation whose final agreement permits harvesting types of timber (*Forest Act* ss.48(1)(g) or (h)); and
2. **Road Maintenance or Deactivation:** The right to cut, damage or destroy standing timber under a road permit, occupant licence to cut or road use permit necessary to maintain or deactivate a road.

Consistent with the term of Spotted Owl DA 2, Ministerial Order M61/2022 is rescinded February 28, 2023.

Spotted Owl Protection Status Now

The provincial government is currently reporting that a total of 325,000 ha of spotted owl habitat have been protected:

- 175,000 hectares as Wildlife Habitat Areas under the *Forest and Range Practice Act*; and
- 150,000 hectares within existing protected areas such as Provincial Parks and the Metro Vancouver watersheds.⁴

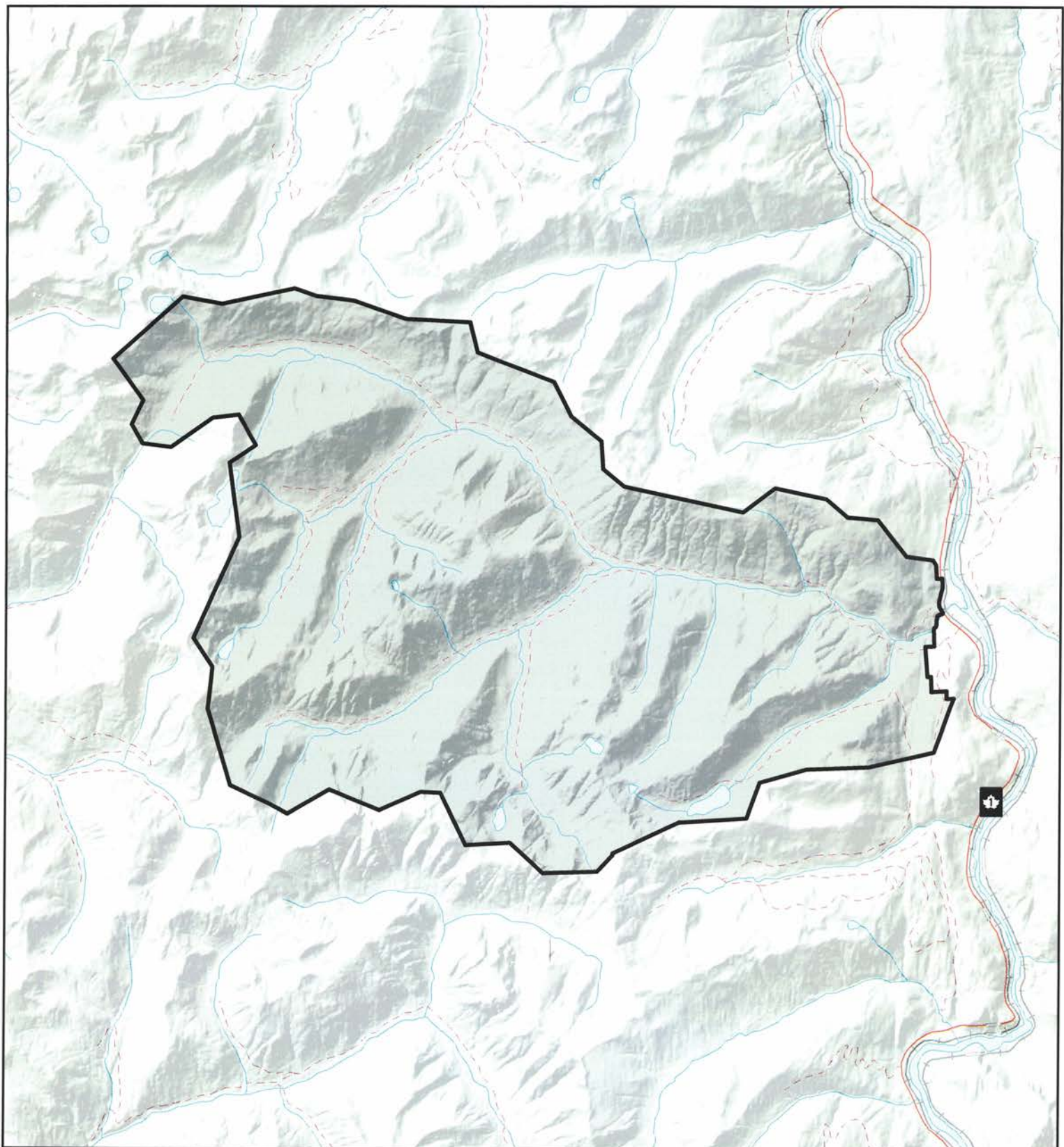
As Designated Areas are neither wildlife habitat areas nor protected areas, it would appear that, with DA 2, the total exceeds 325,000 ha.

Designated Areas in BC

Including Spotted Owl DA 2, there are nine Designated Areas in effect in BC. The current government established all but two of these areas.

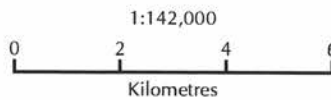
This Update provides a summary of changes for general information purposes only. It does not constitute legal advice, and should not be relied on as such. It is intended for subscribers only. Key changes are selected, so not all changes are described. Readers should refer to the legislation to identify a comprehensive list of changes and determine the actual scope and effect of those changes. E&OE. © 2022. Lawson Lundell LLP. All rights reserved. This Update may be copied or transmitted without further permission by subscribers for internal use only.

⁴ *Northern Spotted Owl Recovery & Breeding Program*. Province of British Columbia. <https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/species-ecosystems-at-risk/implementation/conservation-projects-partnerships/northern-spotted-owl#>



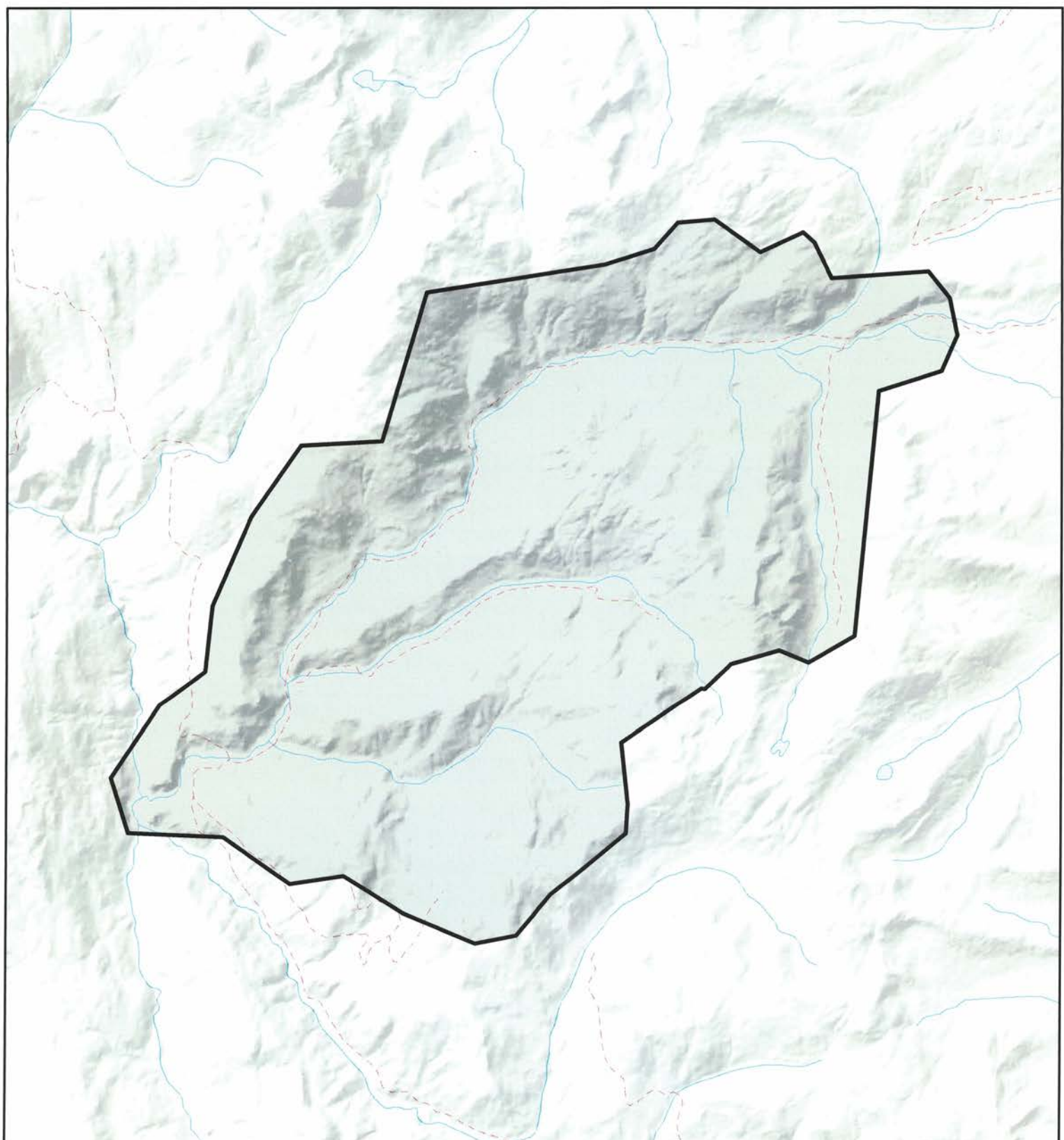
Spotted Owl
Designated Area No.1
Schedule 1 of 2
Spuzzum

 Designated Area



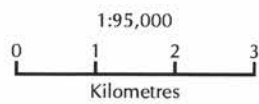
PRODUCED BY: GeoBC, Ministry of Forests,
Lands, Natural Resource Operations and Rural
Development February 9, 2021





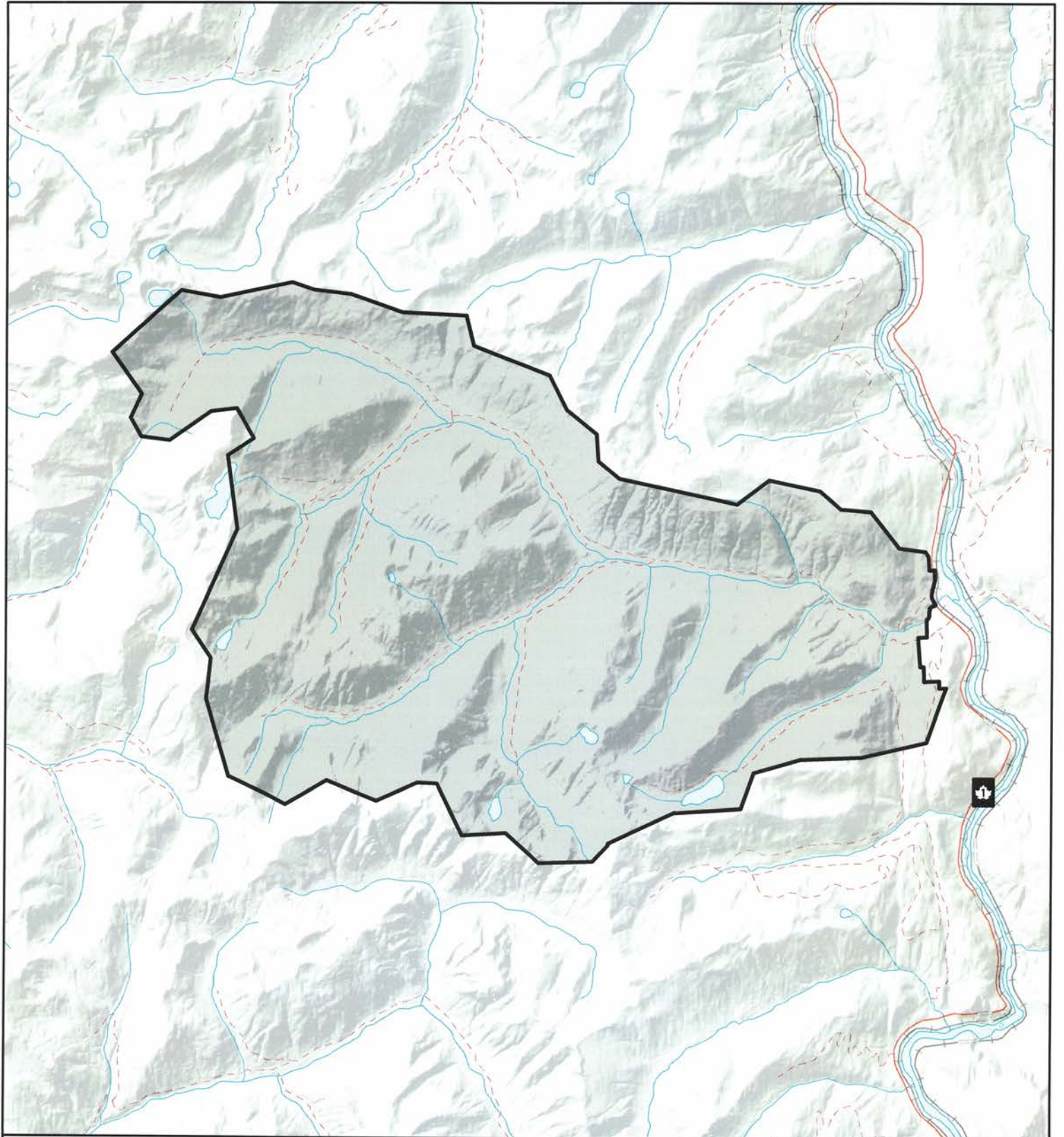
Spotted Owl
Designated Area No.1
Schedule 2 of 2
Utzlius

 Designated Area



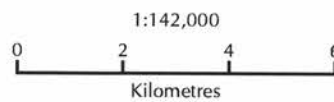
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Lands, Natural Resource Operations and Rural
Development February 9, 2021





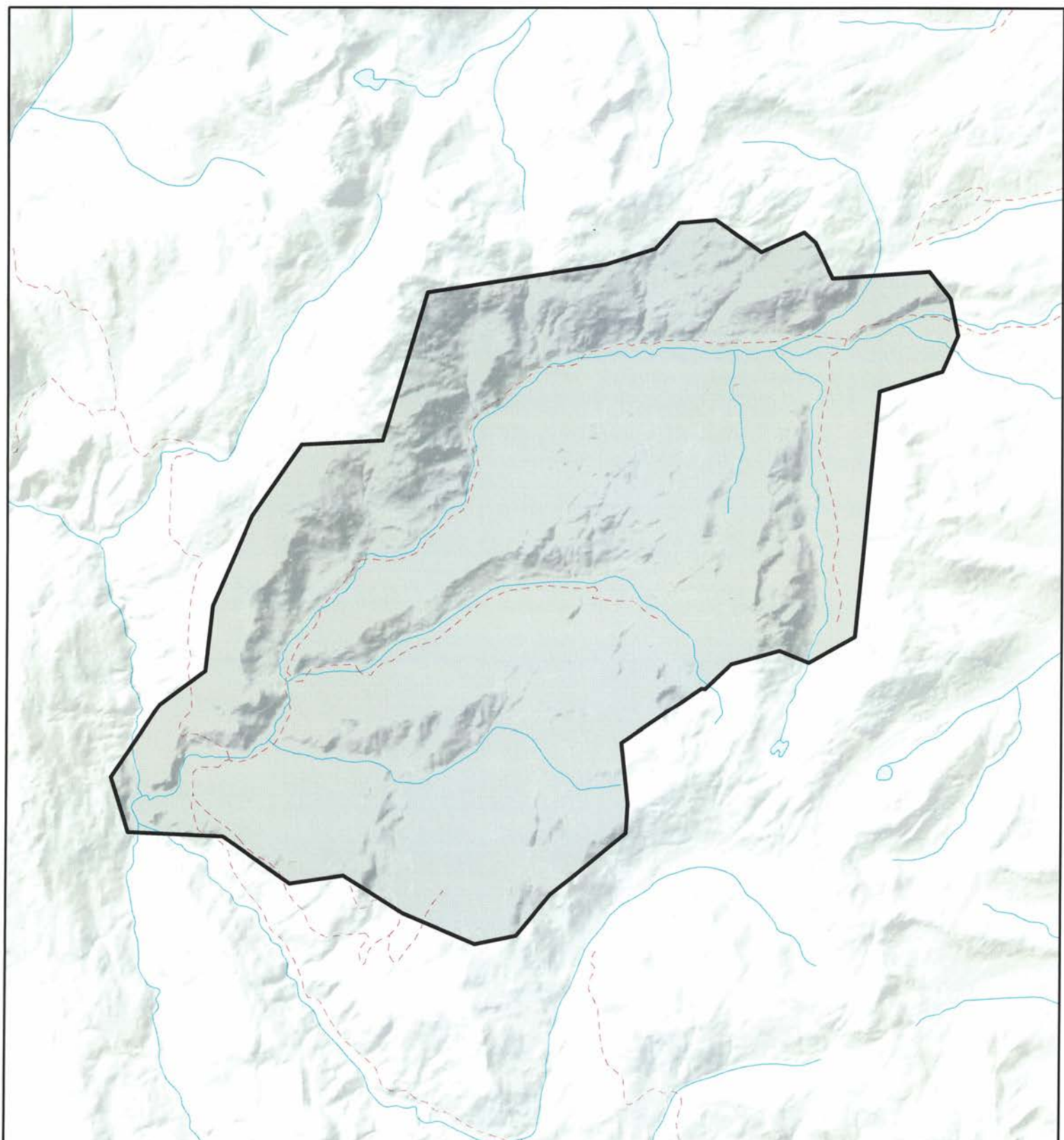
Spotted Owl
Designated Area No.2
Schedule 1 of 2
Spuzzum

 Designated Area



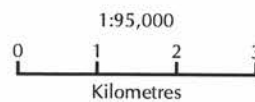
PRODUCED BY: GeoBC, Ministry of Forests,
Lands, Natural Resource Operations and Rural
Development February 8, 2022





Spotted Owl
Designated Area No.2
Schedule 2 of 2
Utzlius

 Designated Area



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SPOTTED OWL

Strix occidentalis

Original by Ian Blackburn and
Stephen Godwin

Species Information

Taxonomy

Three subspecies are recognized: Mexican Spotted Owl (*Strix occidentalis lucida*), California Spotted Owl (*S. occidentalis occidentalis*), and Northern Spotted Owl (*S. occidentalis caurina*) (Dawson et al. 1986; Wilcove 1987). Starch-gel electrophoresis was unable to detect variation between *S. occidentalis occidentalis* and *S. occidentalis caurina*; however, *S. occidentalis lucida* did show variation, suggesting the possibility of two distinct species (Barrowclough and Gutierrez 1990). In addition, two separate evolutionary histories have been demonstrated by the major allelic frequency difference between *occidentalis/caurina* and *lucida* (Barrowclough and Gutierrez 1990).

Description

The Spotted Owl is considered a medium-sized owl with an average height of about 45 cm, and average wingspan of about 90 cm. The plumage consists largely of dark brown body feathers with a regular pattern of round to elliptical white spots, white horizontal bars on the chest and tail, large dark brown eyes surrounded by tawny facial disk, and no ear tufts. Male and female Spotted Owls have similar plumage. Females may be distinguished by their comparatively larger body size (females: $n = 65$, mean = 663 g, SD = 42.8 g; males: $n = 68$, mean = 579 g, SD = 34.9 g; Blakesley et al. 1990), and higher pitch of their vocalization (Forsman et al. 1984).

Distribution

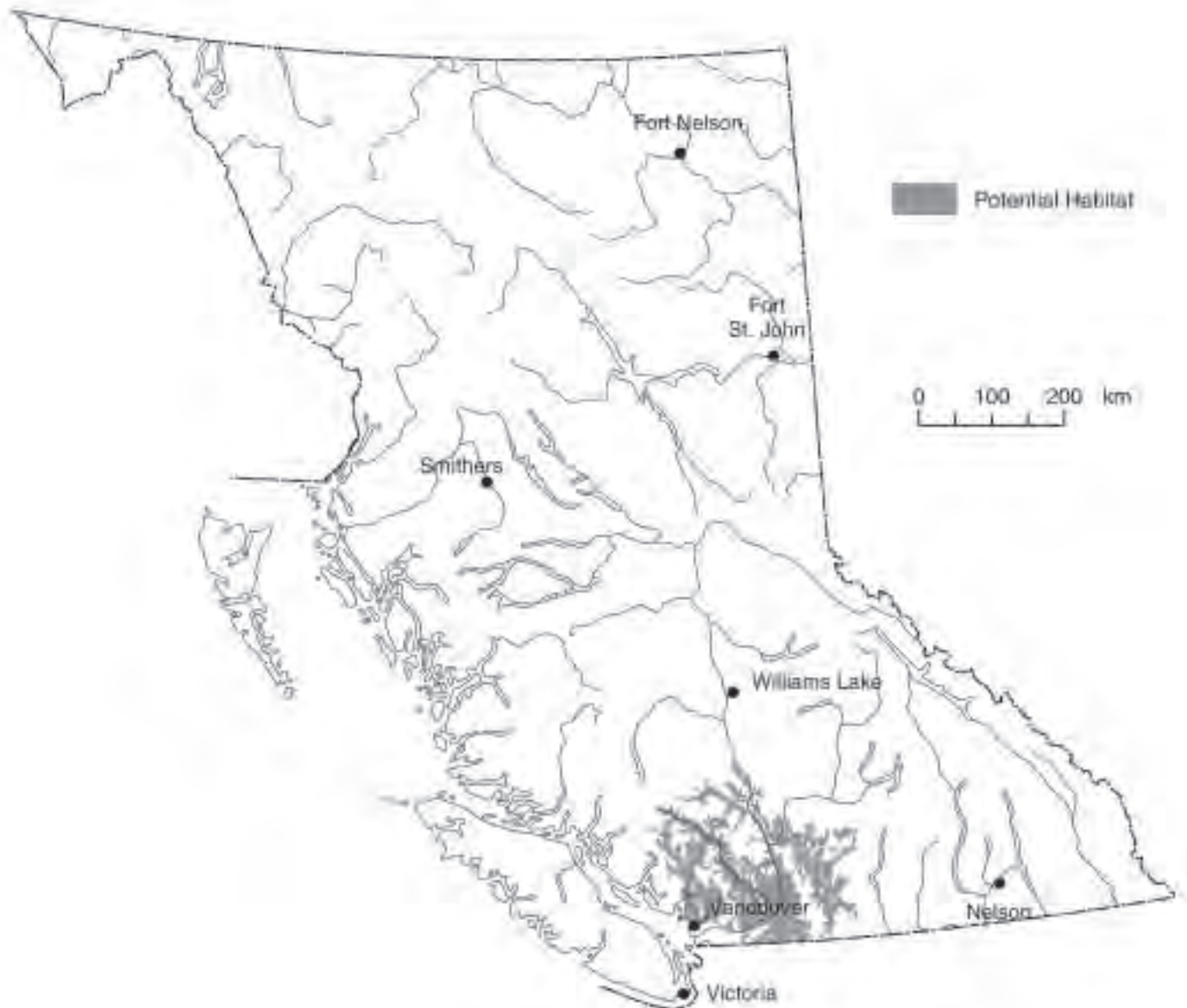
Global

The Spotted Owl occurs from southern British Columbia south to central Mexico. The Mexican Spotted Owl ranges from southern Utah and central Colorado, south through the mountainous regions of Arizona and New Mexico; Guadalupe Mountains of western Texas; mountains of northern and Central Mexico south to Michoacan and Guanajuato. The California Spotted Owl ranges from southeastern Shasta County, south through the Sierra Nevada to Kern County, through the Coast Ranges from Monterey County to San Diego County to northern Baja California (Sierra San Pedro Martir). The Northern Spotted Owl ranges from southwestern mainland British Columbia, western Washington, western Oregon, to northwestern California.

British Columbia

Based on historic (pre-1985, $n=28$) and recent ($n = 65$) records, the current known range of the Spotted Owl in British Columbia extends from the international border north about 200 km to Carpenter Lake, and from Howe Sound and Pemberton east about 160 km to the slopes of the Cascade Mountain range (MWLAP 2003). There are unconfirmed historic records occurring as far northwest as Bute Inlet in the Sunshine Coast Forest District (Laing 1942). Although the Spotted Owl occurred historically in the lowlands of the lower Fraser River Valley, the species is thought to be extirpated from this area as a result of the extensive loss of old forests due to urbanization, agriculture, and forestry. Despite relatively recent historic records, survey efforts conducted between 1992 and 1997 in the Squamish and Whistler corridor were

Spotted Owl (*Strix occidentalis*)



Note: This map represents a broad view of the distribution of potential habitat used by this species. The map is based on several classifications (Forest Cover Data and Biogeoclimatic) as well as current knowledge of the species' habitat preferences. This species may or may not occur in all areas indicated. More detailed maps are available for this species from the Ministry of Sustainable Resource Management.

unsuccessful at detecting Spotted Owls, suggesting that the species may have become locally extirpated in this area. The full extent of the range of Spotted Owls in British Columbia is still unknown. Inventories are still required to assess the western, northern, and eastern extent of the species range.

Forest region and districts

Coast: Chilliwack, Squamish

Southern Interior: Cascades

Ecoprovinces and ecoregions

COM: EPR, NWC, SPR

GED: FRL

SOI: LPR, HOR

Biogeoclimatic units

CWH: dm, ds1, mm1, ms1, ms2, vm1, vm2

ESSF: mw

IDF: dk2, ww

MH: mm1

Broad ecosystem units

AU, AV, CD, CH, CW, DE, DL, EW, FR, IH, MF, RD

Elevation

~0–1370 m

Life History

Diet and foraging behaviour

Spotted Owls are nocturnal and considered a sit and wait predator that moves from perch to perch waiting to detect prey. Spotted Owls primarily prey on small mammals, although they have been known to predate on a broad array of taxa including birds, amphibians and insects (Forsman et al. 1984). The composition of their diet varies among regions and forest types. In general, their diet includes flying squirrels, deer mice, tree voles, woodrats, red-backed voles, and hares. Pellet analysis of Spotted Owls in British Columbia revealed the largest contribution (41.2%) to the owl's diet is Northern Flying Squirrels (*Glaucomys sabrinus*) and bushy-tailed woodrats (*Neotoma cinerea*) (27.8%; Horoupian et al. 2000), which is consistent with other studies throughout the species range (Forsman et al. 1984;

Forsman et al. 2001). Flying squirrels are also nocturnal, and tend to be more abundant in old forests than in young forests; however, their density in old forests is low (Carey et al. 1992). In British Columbia, Ransome (2001) found the density of Flying Squirrels in old forest in the wet coastal ecosystem to be 1.5 ± 1.8 squirrels/ha (range 0.3–2.9) and in second-growth stands to be 1.0 ± 1.4 squirrels/ha (range 0.06–1.8). Although the densities in British Columbia were not significantly different, the results suggest densities of flying squirrels may be higher in old forests. Even a potential 0.5 squirrel/ha more in old forest than second growth could translate to significantly more squirrels within a home range and improve the owls' likelihood of survival and reproduction. Due to this low density of prey, the Spotted Owl requires large amounts of old forest for foraging (Carey et al. 1992).

Reproduction

Spotted Owls are typically monogamous, although evidence suggests a low, but frequent occurrence of separation between pairs (Forsman et al. 2002). In late winter, Spotted Owls begin roosting together near the nest 4–6 weeks prior to egg laying, with copulation generally occurring 2–3 weeks before nesting (Forsman et al. 1984). The average clutch size is two owlets \pm one owlet. The incubation period is estimated to be approximately 30 days \pm 2 days (Forsman et al. 1984). Females incubate and brood the juveniles while the males provide food for both females and juveniles (Forsman et al. 1984). Most juveniles leave the nest when they are 34–36 days old. Although the mean date when juveniles left the nest varied among years, Forsman et al. (2002) reported mean dates of June 8 ± 0.53 days in Oregon ($n = 320$ owls, range May 15 to July 1) and June 18 ± 1.67 days in Washington ($n = 77$, range May 13 to July 15). Similar to Washington, juveniles at two locations in British Columbia were observed off the nest between June 15 and June 20 (Hobbs 2002); however, juveniles have been observed off the nest in British Columbia as early as on June 7 (D. Dunbar, pers. comm.). The results support Forsman et al. (1984) that nesting typically occurs earlier in southern portions of the species range in

North America. In Washington and Oregon, re-nesting after a nest failure was rare, only occurring 1.4% of the time after an initial failure (Forsman et al. 1995).

In Washington and Oregon, Forsman et al. (2002) reported that 22% of males and 44% of females were paired at 1 year of age; however, only 1.5% of 1-year-old males and 1.6% of 1-year-old females actually bred. Typically, Spotted Owls begin breeding at 3 years of age. Franklin et al. (1999) note that fecundity appears to vary over time with evidence of a bi-annual cycle where by more young fledged in even years than odd years (even/odd effect). The cause of this cyclic pattern is unknown, but may be linked to weather or prey populations (Franklin et al. 1999).

Site fidelity

Spotted Owls typically have strong fidelity to breeding sites and tend to occupy the same geographic area for long periods of time (Forsman et al. 1984). Forsman et al. (2002) observed a minimum 6% of non-juvenile owls changed territories annually. The frequency of these non-juvenile movements was higher for female owls, younger owls, and owls without a mate or who had lost their mate through death or separation in the previous year. In the Olympic Mountain range in Washington, owl pairs changed nests in 75% of sequential nesting attempts; 40% returned to a nest used previously (Forsman and Giese 1997). The median distance between these alternate nests was 0.52 km (range 0.03–3.35 km; $n = 92$).

Home range

Home range sizes vary by geographic location, with a general increasing trend from southern to northern portions of the species range (Thomas et al. 1990). For example, home range sizes have been reported as small as 549 ha for a single owl in Oregon (Forsman et al. 1984) and as large as 11 047 ha for a pair of owls in Washington (Hanson et al. 1993). The size of an owl's home range depends on many factors including food availability; interspecific and intra-specific competition; presence of predators; and the

quantity, quality, and dispersion of suitable habitats (USDI 1992). For example, decreasing the density of suitable habitat or prey populations within the landscape may result in an increase in home range size as owls expand their foraging area to find sufficient amounts of habitat with prey.

In Washington, the median annual home range for a pair of owls for the west side and east side of the Cascade Mountain range was estimated at about 3321 ha (range 1302–7258 ha) and 2675 ha (range 1490–6305 ha), respectively, with a total suitable habitat composition of 67% and 71%, respectively (Hanson et al. 1993). In British Columbia, annual home range estimates for 3 pairs of owls in the drier ecosystem ranged from 1732 to 4644 ha, with suitable habitat compositions ranging from 60 to 66% (A. Hilton, pers. comm.). However, these home ranges for British Columbia are likely underestimated due to the small sample size and limited seasonal tracking duration. Annual home range sizes for British Columbia are likely comparable to those in Washington, if not slightly larger.

Forsman et al. (1984) observed an average 68% home range overlap between paired individuals. Despite this overlap, paired individuals used the same locations for foraging only 4–10% of the time, suggesting little competition for food between paired individuals. In contrast, adjacent, non-paired individuals overlap their home ranges by about 12% where both owls tend to spend relatively small portions of their time in the periphery of their home range (Forsman et al. 1984).

Movements and dispersal

Juveniles are obligate dispersers and typically leave their natal area by September 19 (95% CI, September 17 to 21) in Oregon and September 30 (95% CI, September 25 to October 4) in Washington (Forsman et al. 2002). In British Columbia, the latest date that juveniles owls were observed with their parents was September 28 (2 records; MWLAP 2003), suggesting that the initial date of dispersal is likely similar to Washington. The direction of dispersal appears random; however, it may be influenced by barriers such as high elevation terrain,

large bodies of water, and large open areas of unsuitable habitat (Thomas et al. 1990; Miller et al. 1997; Forsman et al. 2002). Distances between the natal area and where the owls eventually settled ranged from 0.6 to 111.2 km apart; however, the distribution of distances were skewed towards shorter distances (Forsman et al. 2002). Female juveniles typically disperse farther than males, with 50% of female and male juveniles settling within 22.9–24.5 km and 13.5–14.6 km from their natal areas, respectively (Forsman et al. 2002).

Habitat

Structural stage

- 6: mature forest
- 7: old forest

Important habitats and habitat features

Nesting

Spotted Owls do not create their owl nest structures, but use a variety of pre-formed structures that includes cavities in the side and top of trees, and platforms constructed by other birds or by natural accumulations of debris (Forsman et al. 1984; Dawson et al. 1986; Buchanan et al. 1993; Forsman and Giese 1997). Nest structures are about 50 cm in diameter, and typically do not differ in size by nest type or geographic region (Forsman and Giese 1997). However, tree species and size of nest trees (dbh) are geographically variable and selection is thought to be based largely on the availability of suitable cavities and platforms. Regardless of geographic region, cavity nests were in trees with greater diameters than platform nests (Table 1).

In wetter ecosystems, Spotted Owls primarily nest in cavities in large diameter trees typically found in old forest stands or younger stands with residual large diameter old trees (Thomas et al. 1990; Forsman and Giese 1997). In the Olympic Mountain range, nest trees averaged 136.6 cm dbh and were predominantly western hemlock (*Tsuga heterophylla*), western redcedar (*Thuja plicata*), and Douglas-fir (*Pseudotsuga menziesii*) ranging from 114 to 1189 m in elevation. In drier ecosystems, Spotted Owls nest in a wide range of forest stand ages ($n = 62$, median age = 147 yr, range 66–700 yr; Buchanan et al. 1993)

and forest structures. On the eastern slopes of the Cascade Mountain range in Washington, nest trees averaged 66.5 cm dbh and were found almost exclusively in Douglas-fir trees ranging from 381 to 1463 m in elevation (Buchanan et al. 1993, 1995). In contrast to wetter ecosystems, 84% ($n = 85$) of Spotted Owl nests were on platforms in trees created by abandoned Northern Goshawk (*Accipiter gentilis*) nests ($n = 47$) or mistletoe brooms ($n = 21$), with only 16% of nests found in cavities or tops of trees (Buchanan et al. 1993). In British Columbia, nests have been similarly found in cavities of large diameter living western redcedar, western hemlock, and Douglas-fir trees, in tops of large diameter dead Douglas-fir snags, and in abandoned Northern Goshawk nests.

Foraging

Three habitat types have been defined in Washington based on their use by Spotted Owls for nesting, roosting and foraging (Hanson et al. 1993). Superior habitats are preferred by Spotted Owls as these habitats are used by the owl in greater proportion than the availability of this habitat type in the landscape. Moderate habitats are used by Spotted Owls in equal proportion to the availability of this habitat type in the landscape. Marginal habitats are used less than this habitat type's availability in the landscape, and are considered unsuitable for sustained use by Spotted Owls. Table 2 defines the stand characteristics for superior and moderate habitats for the wetter and drier ecosystems.

Spotted owls are a sit and wait predator that usually roost within or adjacent to forest stands used for foraging. The structural diversity found in superior habitat type provides for numerous roosting and foraging perches at various heights in the canopy and understorey. The openness of these stands allow for greater maneuverability within the canopy layers and greater access to prey. These open stands tend to possess higher quantities of understorey shrubs and herbs that support higher densities of prey. The characteristics of superior habitat is predominantly found within old forest (forests >140 yr); however, some younger forests, particularly in drier ecosystems, may also possess these characteristics.

Table 1. Comparison of nest tree diameter at breast height (dbh), tree height, and nest diameter among three geographic regions in Washington and Oregon

	Cavity nests			Platform nests		
	<i>n</i>	mean	SD/SE	<i>n</i>	mean	SD/SE
Washington Olympic Mountains – (Forsman and Giese 1997)						
dbh (cm)	99	141.8	6.15 SE	11	88.7	15.74 SE
Tree height (m)	95	40.7	1.36 SE	11	39.8	3.99 SE
Nest diameter (cm)	76	45.3	1.15 SE	10	48.0	4.59 SE
Washington Eastern Slopes of Cascade Mountains – (Buchanan et al. 1993)						
dbh (cm)	14	94.7	23.1 SD	71	59.4	21.8 SD
Tree height (m)		Not reported			Not reported	
Nest diameter (cm)		Not reported			Not reported	
Oregon – (Forsman et al. 1984)						
dbh (cm)	28	135.0	6.03 SE	16	106.0	11.93 SE
Tree height (m)	28	38.1	2.37 SE	16	42.0	3.42 SE
Nest diameter (cm)	20	50.0	0.93 SE	8	62.0	1.32 SE

Table 2. Suitable Spotted Owl habitat definitions for British Columbia (SOMIT 1997)

Superior habitat (nest, roost, forage and dispersal)	Moderate habitat (roost, forage, and dispersal)
Wetter ecosystems: maritime CWH and MH biogeoclimatic zones (CWHdm, CWHvm1, CWHvm2, MHmm1)	
<ul style="list-style-type: none"> • ≥3 canopy layers, multi-species canopy dominated by large (>75 cm dbh) overstorey trees (typically 37–185 stems/ha) • moderate to high (60–80%) canopy closure • ≥5 large (>50 cm dbh) trees/ha with various deformities (e.g., large cavities, broken tops, dwarf mistletoe infections) • ≥5 large (>75 cm dbh) snags/ha. • accumulations (≥268 m³/ha) of fallen trees and other CWD on ground 	<ul style="list-style-type: none"> • ≥2 canopy layers, multi-species canopy dominated by large (>50 cm dbh) overstorey trees (typically 247–457 stems/ha, although densities as low as 86 stems/ha are possible where large diameter trees are present) • moderate to high (60–80%) canopy closure • ≥5 large trees/ha (>50 cm dbh) with various deformities (e.g., large cavities, broken tops, dwarf mistletoe infections) • ≥5 large (>50 cm dbh) snags/ha • accumulations (≥100 m³/ha) of fallen trees and other CWD on ground
Drier ecosystems: sub-maritime CWH and MH, IDF, and ESSF biogeoclimatic zones (CWHds1, CWHms1, CWHms2, MHmm2, ESSFmw, IDFww)	
<ul style="list-style-type: none"> • ≥3 canopy layers, multi-species canopy dominated by large (>50 cm dbh) overstorey trees (typically 173–247 stems/ha, although densities as low as 86 stems/ha are possible where large diameter trees are present) • moderate to high (60–85%) canopy closure • ≥5 large trees/ha (>30 cm dbh) with various deformities (e.g., large cavities, broken tops, dwarf mistletoe infections) • ≥7 large (>50 cm dbh) snags/ha. • accumulations (≥268 m³/ha) of fallen trees and other CWD on ground 	<ul style="list-style-type: none"> • ≥2 canopy layers, multi-species canopy dominated by large (>30 cm dbh) overstorey trees (typically greater than 247 stems/ha) • stands must contain 20% Fd and/or Hw in the overstorey • >50% canopy closure. • ≥5 large trees/ha (>30 cm dbh) with various deformities (e.g., large cavities, broken tops, dwarf mistletoe infections) • ≥5 large (>30 cm dbh) snags/ha • accumulations (≥100 m³/ha) of fallen trees and other CWD on ground

Conservation and Management

Status

The Spotted Owl is on the provincial *Red List* in British Columbia. It is considered *Endangered* in Canada (COSEWIC 2002). The “Northern” Spotted Owl is federally designated as Threatened throughout its entire range in the United States under the U.S. *Endangered Species Act*.

Summary of ABI status in BC and adjacent jurisdictions (NatureServe Explorer 2002)

BC	CA	OR	WA	Canada	Global
S1	S2	S3	S3	N1	G3T3

Trends

Population trends

Blackburn et al. (2002) estimated the historic (pre-European settlement) Spotted Owl population size in British Columbia as about 500 pairs of owls. Between 1992 and 2001, the Spotted Owl population declined by about 49% at an average annual rate of -7.2% ($\pm 1.7\%$ for 90% CI; Blackburn et al. 2002).

Survey results from 2002 suggest that the population declined by an additional 35% between 2001 and 2002. Combined, the Spotted Owl population has declined by about 67% since 1992 at an average rate of -10.4%/yr (Blackburn and Godwin 2003).

Applying this observed decline to the fewer than 100 pairs of owls estimated in British Columbia in the early 1990s (Dunbar et al. 1991) suggests that the current Spotted Owl population in British Columbia may be fewer than 30 pairs of owls. It is reasonable to assume that the extirpation of the Spotted Owl from British Columbia is imminent if the observed annual rate of decline continues (Blackburn et al. 2002).

The observed large decline in Spotted Owl numbers is not exclusive to British Columbia. In the United States, monitoring of Spotted Owls at 15 different demographic study areas between 1985 and 1998

suggests a range-wide annual population decline of -3.9% ($\pm 3.6\%$ for 95% C.I.; Franklin et al. 1999).

Habitat trends

Since European settlement, timber harvesting for urbanization, agriculture, and resource extraction has occurred, with almost the entire forested area in the lower Fraser River Valley converted to non-forest uses. It is estimated that suitable habitat represents about 50% of the current capable forested area in the two forest districts (Blackburn et al. 2002). Some of these habitats are currently unusable by Spotted Owl due to their small patch size, isolation from other habitat patches, or distribution in landscapes with suitable habitat densities too low to support the species. Over the next 25 years, the rate of habitat loss caused by timber harvest and natural disturbance is expected to exceed the recruitment of suitable habitat from young forests, resulting in further fragmentation and isolation of habitats available to the owl (Blackburn and Godwin 2003).

Threats

Due to their small population size and low densities, Spotted Owls in British Columbia are vulnerable to extirpation. Factors that threaten the species can be divided into primary and secondary factors (Blackburn and Godwin 2003). Primary factors cause long-term sustained effects that limit the carrying capacity, or total capable population size. Primary factors include habitat loss and fragmentation, competition with Barred Owls (*Strix varia*), and global warming. Secondary factors cause short-term effects in population size, but the population recovers from these factors relatively soon after the influence of the factor changes to a more favourable condition. Secondary factors include stochastic environmental and demographic events, genetic variability, predation, disease, parasites, and viruses. Although primary factors limit population size and may cause extirpation, secondary factors are likely the leading cause of extirpation of small populations.

Population threats

Since the 1960s, Barred Owls have invaded the range of the Spotted Owl. Although some niche segregation is evident (Hamer et al. 1989), Barred Owls likely exclude Spotted Owls from utilizing some mature and old forests found within core Barred Owl territories. As well, the presence of both species within the same geographic area may suppress prey populations. The combined competitive effect of habitat exclusion and prey suppression may cause Spotted Owls to increase their home range size to compensate for this loss, or cause the displacement of Spotted Owls as they leave their territory to find new territories with less competition (Kelly 2001). In addition to these competitive effects, the low occurrence of cross breeding between Spotted Owls and Barred Owls negatively impacts the reproductive success of the Spotted Owl population by effectively removing adult Spotted Owls from the pool of potential breeders.

Catastrophic environmental events such as fire, windstorms, and insect outbreaks may eliminate both habitat and Spotted Owls that they support (Thomas et al. 1990). As well, severe weather events may cause poor reproductive performance or high adult mortality, resulting in periodic gaps in the demographic profile. If the population cannot recover from these events, the population may continue to decline to extirpation as future stochastic events occur.

Isolated small populations are prone to decreased genetic variability caused by founder effects, increased incidence of inbreeding, and/or genetic drift. Isolated populations may have higher incidences of adult and juvenile mortality caused by pronounced deleterious recessive genes, reduced adaptability to environmental change, and/or higher susceptibility to disease. Furthermore, closely related individuals may not mate at all, thereby reducing the productivity and recruitment of the population. Decreasing population size and increasing isolation of individuals and populations places the Spotted Owl population in British Columbia at greater risk of extirpation caused by the loss of genetic variability.

Spotted Owls are incidental prey to several predators including Great Horned Owls (*Bubo virginianus*) and Northern Goshawks. Ravens are also predators, more likely preying on very young owls and eggs rather than adult owls. Some researchers also include Barred Owls as a possible predator, although evidence is limited (Kelly 2001). Most predation of individuals is thought to occur during juvenile dispersal, when young owls are inexperienced and searching for new habitats. Perhaps the increasing abundance of unsuitable habitats within the landscape has increased the exposure of dispersing Spotted Owls to predators as they move through these unsuitable habitats resulting in an increased rate of mortality. For predators to be the main cause of the population decline requires the rate of mortality to be higher than normal mortality rates caused by predation.

Spotted Owls are prone to disease, parasites, and viruses; however, these seldom result in sufficient mortality to cause population declines. Of recent concern is the range expansion of the West Nile Virus. The West Nile Virus is usually transmitted to birds through mosquitoes, where once established in a bird, mortality may follow. Those that survive may act as carriers to help spread the virus. Although the West Nile Virus does not occur within southwestern British Columbia, it likely is only a matter of time before it does. Its potential impact on the Spotted Owl is not known; however, there is a risk that it could cause further declines in Spotted Owl numbers in British Columbia.

Habitat threats

Habitat is threatened by timber harvesting, urbanization, and natural disturbances such as fire, wind, insects, and diseases. Habitat loss and fragmentation may increase the risk of mortality caused by predation and exposure of owls that must move through unsuitable habitats to reach other suitable habitats. Within an owl's territory, habitat loss and fragmentation may cause the resident owls to increase their home range size to compensate for this habitat loss and need to find sufficient prey. As well, habitat loss and fragmentation may reduce the

reproductive success and adult survivorship as adult owls must expend more energy to find food farther away from their core area. Eventually continued habitat loss and fragmentation within a home range will surpass the minimum threshold needed to sustain owls, and the area will remain vacant from Spotted Owls until habitats are restored. As a result, the number of potential territories available in the landscape is reduced. Isolation of territories occurs as the interspatial distances between territories exceed the maximum distance needed for successful dispersal. Without successful dispersal, isolated territories and populations will eventually decline to extirpation.

Legal Protection and Habitat Conservation

The Spotted Owl, its nests, and its eggs are protected under the provincial *Wildlife Act*.

A Spotted Owl Recovery Team was formed in 1990 to develop a recovery plan for the species. At the request of the provincial government, the recovery team developed a range of management options that spans the scale from minimum to maximum protection for Spotted Owl with correspondingly minimum to maximum socio-economic consequences (Dunbar and Blackburn 1994). In 1997, the provincial Cabinet approved the Spotted Owl Management Plan (SOMP) with the goal of achieving a reasonable level of probability that owl populations will stabilize, and possibly improve, over the long term without significant short-term impacts on timber supply and forest employment. The SOMP recognizes that the Spotted Owl population will continue to decline over the next 20–30 years with a 60% chance of the population stabilizing, and possibly improving its status over the long term. Timber supply impacts of SOMP are estimated at between 3 to 5% reduction in allowable annual cut. The SOMP includes a strategic and operational guidelines component, and Resource Management Plans. The strategic component describes the strategic objectives and policies for Spotted Owl management in 21 special resource management zones (SRMZs) totalling about

363 000 ha) identified for the long-term conservation of the species. The operational guidelines component provides resource managers with further guidance for developing long-term Resource Management Plans within SRMZs, and forest practices that will create or retain forest attributes critical for Spotted Owl survival. Resource Management Plans demonstrate how, over a long-term planning horizon of one or more forest rotations, the Spotted Owl and forest management objectives and policies will be achieved in each SRMZ. Resource Management Plans identify landscape and stand level management strategies that are expected to best protect suitable habitat and to provide forestry, economic and employment opportunities.

The 21 SRMZs include 159 000 ha of protected areas (includes capable/suitable habitats within the Greater Vancouver Watershed Districts: Seymour, Capilano, and Coquitlam; protected areas: Seymour, Cypress, Garibaldi, Golden Ears, Sasquatch, Manning, Skagit, Pinecone/Burke Mountain, Birkenhead Lake, Mehatl Creek, and Liumchen) and 204 000 ha of Crown forest land. The SRMZs are spaced a maximum 20 km apart to provide a reasonable chance that owls can disperse from one SRMZ to another. Each SRMZ varies in size and contains between 2 to 13 Long-term Activity Centre (LTACs), each about 3200 ha and capable of sustaining a breeding pair of Spotted Owls in the future. The long-term stabilization, and possible improvement, of the Spotted Owl population is dependent upon maintaining, or restoring, a minimum 67% of the gross forested area as suitable habitat (i.e., forests >100 years old, taller than 19.4 m, and below 1370 m) in each LTAC. Of the 101 LTACs identified within SRMZs, only 55 LTACs currently meet the minimum 67% habitat target. Recruitment of habitat up to this minimum target in the other 45 LTACs may require up to 60 years.

The SOMP provides temporary protection for an additional eight activity centres (referred to as Matrix Activity Centres) that are found entirely or partially outside of SRMZs. These Matrix Activity Centres are to be phased out by allowing, over a 50-year period, limited clearcutting of suitable habitat

at a similar rate as suitable habitat is recruited within SRMZs. However, some Matrix Activity Centres will be phased out sooner to achieve forest company timber needs to offset the impacts associated with the creation of the Mehatl Creek Protected Area (SOMIT 1997).

The SOMP does not provide protection over existing provisions of the *Forest and Range Practices Act*, to Spotted Owl activity centres found outside of SRMZs, Matrix Activity Centres, and protected areas discovered after June 1995. Since June 1995, 19 Spotted Owl activity centres have been discovered and remain unprotected. Fourteen of these occur farther north beyond the managed range of SOMP, eight of which occur in the Cascades Forest District (formerly the Lillooet Forest District).

Due to concern over the Endangered status and immediate threat of extirpation, a Spotted Owl Recovery Team was re-established in 2002 to develop a Recovery Plan including assessing the SOMP's effectiveness for stabilizing the population. Completion of the Spotted Owl Recovery Plan is expected by 2005.

Identified Wildlife Provisions

Sustainable resource management and planning recommendations

Due to the status of the Spotted Owl in British Columbia, all individual owls are critical to the recovery of the species and should be considered for protection. The following recommendations may be considered within strategic level planning processes. These recommendations are consistent with the Spotted Owl Management Plan, and its associated documents, and are recommended for the management of habitat to sustain a pair of Spotted Owls (see SOMP for more information). These management provisions may change pending the implementation of a Spotted Owl Recovery Plan or other direction from government.

- ❖ Maintain suitable Spotted Owl habitat (i.e., coniferous forest >100 years old, >19.4 m tall and <1370 m elevation).

- ❖ Maintain LTACs throughout the range of the Spotted Owl.
- ❖ Where possible aggregate LTACs into clusters of multiple breeding territories.
- ❖ Where possible the distance between LTACs and clusters of LTACs should be <20 km.
- ❖ Where the distance between LTACs is >20 km, consider establishing an additional LTAC to ensure habitat connectivity to facilitate dispersal.
- ❖ Maintain or restore suitable habitat within LTACs.
- ❖ Wherever possible and practicable, overlap LTACs with other constrained areas (i.e., protected areas, non-contributing areas) to minimize timber supply impacts.

Wildlife habitat area

Goal

Maintain areas of suitable habitat throughout the range of the Spotted Owl.

Feature

Establish WHAs at resident Spotted Owl areas consistent with current government direction. WHAs may be established to legalize existing LTACs under FRPA, to modify existing LTACs, to protect new resident Spotted Owl areas or to protect other habitat for recovery.

Size

The size of the WHA will generally be 3200 ha of forested area.

Design

The WHA should include a core area(s) (80 ha), and a management zone which includes a long-term owl habitat area (light volume removal) and a forest management area (heavy volume removal). The WHA should include an 80 ha core area around all known nesting or roosting sites. The WHA should also include a minimum of 67% suitable habitat (i.e., coniferous forest >100 years old, >19.4 m tall and <1370 m). The long-term owl habitat areas (LTOHAs) define where, over the long term, the minimum 67% suitable habitat target will be maintained or restored within each WHA. The

forest management areas (FMAs) define where, over the long term, timber harvesting can occur to reduce the amount of suitable habitat as low as the 67% habitat target for the WHA.

General wildlife measures

Goals

1. Protect known nest and roost areas. Recruit suitable nesting and roosting habitat and habitat structures.
2. Minimize disturbance at known nesting and roosting sites.
3. Maximize forest interior habitat.
4. Create, enhance, or maintain suitable habitat (i.e., multi-layered, variable density, multi-species stand structure with canopies dominated by dominant and co-dominant trees within areas).
5. Maintain important habitat features (e.g., coarse woody debris, wildlife trees, interior forest, large diameter trees, moderate to high canopy closure; see Table 2).
6. Maintain or enhance habitat for prey species.

Measures

Access

- Do not construct, modify, or deactivate roads or landings within the core area. Where approved, do not construct, modify or deactivate between 1 March and 31 July.
- Minimize road clearing widths to ≤ 3 m between the timbers edge and either the toe of the fill or the top of the cut, unless no other practicable option exists.

Harvesting and silviculture

- Do not harvest or salvage within core area(s).
- Do not salvage in the management zone.
- Do not remove non-timber forest products.
- Maintain or restore at least 67% of the gross forested area within the WHA in suitable owl habitat of which 75% should be maintained or restored as superior habitat (>140 years, >19.4 m tall and <1370 m). When there is <67%, do not harvest the next oldest age class and/or stands that best achieve Spotted Owl habitat distribution objectives. Heavy volume removal is permitted within the FMA when WHA includes >67% suitable habitat.

- Distribute the 67% suitable habitat into large unfragmented patches >500 ha that are connected by movement corridors of suitable habitat that are a minimum of 1 km wide.
- When harvesting in the management zone (LTOAC and FMA) implement the following measures:
 - Patch cuts (0.05–0.5 ha in size) can represent no more than 5% of the prescribed cut block. Patch cuts must be minimum 100 m (edge to edge) from adjacent patch cuts, clearcuts or natural openings >0.25 ha in size.
 - Remove up to one-third of the basal area from each 10 cm stand diameter class distributed evenly across the treatment area.
 - Retention of trees should be relatively evenly distributed throughout cut blocks. Timber extraction corridors will not exceed the average inter-tree spacing requirement of the treatment area as described in Table 3.
 - For cut blocks within CWHds1, CWHms1, CWHms2, MHmm2, ESSFmw, and IDFww, maintain or create on average 5 snags >30 cm dbh/ha and maintain existing coarse woody debris, and add 25 cubic m/ha of unmerchantable logs >30 cm dbh.
 - For cut blocks within CWHdm, CWHvm1, CWHvm2 and MHmm1, maintain or create on average 5 snags >50 cm dbh/ha and maintain existing coarse woody debris, and add 25 cubic m/ha of unmerchantable logs >50 cm dbh.

Table 3. Average corridor width spacing requirements for partial harvests

Retention of dominant trees/ha	Average corridor widths
173	7.6 m
200	7.0 m
250	6.3 m
300	5.8 m
400	5.0 m
500	4.5 m
625	4.0 m
800	3.5 m
1000	3.2 m

Pesticides

- Do not use pesticides.

Within the FMA

- Locate cut blocks in areas that minimize impacts to suitable habitat objectives and Spotted Owls activity.
- Maintain a minimum of 10% wildlife tree retention areas. Wildlife tree retention areas that consist of non-suitable habitat may be enhanced utilizing partial harvest.
- Maintain or create on average 5 snags >76 cm dbh/ha in CWHdm, CWHvm1, CWHvm2 and MHmm1, or maintain or create on average 5 snags >51 cm dbh/ha in the CWHds1, CWHms1, CWHms2, MHmm2, ESSFmw, and IDFww.
- For cut blocks within CWHds1, CWHms1, CWHms2, MHmm2, ESSFmw, and IDFww, there should be an average of 40 windfirm leave trees maintained from the top 80 largest diameter trees/ha.
- For cut blocks within CWHdm, CWHvm1, CWHvm2, and MHmm1, there should be an average of 15 windfirm leave trees maintained from the top 30 largest diameter trees/ha.

Information Needs

1. Current range and distribution in the province.
2. Short-term population changes and long-term population demographics.
3. Habitat selection/preference requirements.

Cross References

Bull Trout, Coastal Giant Salamander, Coastal Tailed Frog, Keen's Long-eared Myotis, Marbled Murrelet, Pacific Water Shrew

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PROBYN LOG LTD.

Appendix 2g

Wildlife: Northern Goshawk



File: FOR – 19500-02/610F (Licensee)

Date: February 13, 2019

To: All Tenure Holders within the Fraser Timber Supply Area (TSA)

Re: Northern Goshawk *laingi* subspecies Breeding Habitat Protection

I am writing as a follow-up to the Chilliwack Natural Resource District (DCK) Forest Management Leadership Team (FMLT) meeting on January 17, 2019 to update Licensees and BC Timber Sales on the management of breeding habitat for Northern Goshawk *laingi* subspecies (NOGO) in the DCK. This letter is intended to provide further clarification on the provincial management approach for NOGO and to notify Licensees of the targets set for the protection of NOGO breeding areas in the DCK to meet government's commitments for the management of the species.

The Northern Goshawk, *laingi*, is designated by the national Committee on the Status of Endangered Wildlife in Canada (COSEWIC) as Threatened and is red-listed in B.C. The federal [Recovery Strategy for the Northern Goshawk *laingi* subspecies](#)¹ partially identifies critical habitat for breeding in BC. The federal *Species at Risk Act* (SARA) gives provincial governments' first opportunity to protect critical habitat under their jurisdiction. The Cabinet approved provincial [Implementation Plan for Northern Goshawk, *laingi* subspecies](#)² was released in February 2018 and is key to demonstrating provincial leadership on the recovery of the species. The Implementation Plan addresses breeding habitat and contains habitat management commitments for provincial Crown land. Implementation Plan objectives involve maximizing conservation efforts to benefit NOGO while minimizing socio-economic impacts.

The Implementation Plan's revised approach to the federal recovery strategy includes managing the coastal NOGO population at 60% protection, which represents a moderate risk at the population level. This equates to a minimum of 110 breeding home ranges to be maintained in the South Coast Region (SCR) to meet population and distribution objectives. Of the 110 breeding areas to be maintained, it is estimated that 57 are already protected in existing constrained areas on the land base (e.g., parks and protected areas, wildlife habitat areas [WHAs], ungulate winter range [UWR], and old growth management areas [OGMAs]) resulting in a protection gap of 53. This protection gap

¹ Available: https://www.registrelp-sararegistry.gc.ca/document/default_e.cfm?documentID=1818

² Available: https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/species-ecosystems-at-risk/recovery-planning/implementation_plan_for_the_recovery_of_northern_goshawk.pdf

will be closed through the establishment of new WHAs with a target size of 200 ha of suitable nesting habitat and a minimum size of 176 ha, which is consistent with the [Guidelines for Managing NOGO breeding areas in Coastal B.C.](#)³ and results in a low-risk of breeding area abandonment.

To help guide management actions for the SCR, an analysis was completed by the Ministry of Forests, Lands, Natural Resource Operations, and Rural Development (FLNRORD) Resource Management Section to determine the approximate number of breeding areas to be protected by Natural Resource District based on the amount of unconstrained suitable breeding habitat on the land base. Using the NOGO habitat and territory models for coastal B.C., FLNRORD has set a long-term target of protecting 14 new breeding areas on Crown land in the DCK, with a short-term goal of protecting 5 new breeding areas by 2020. As a comparison, the long-term targets set for the Sunshine Coast Natural Resource District and Sea to Sky Natural Resource District are 34 and 5 new breeding areas, respectively.

I consider the analysis conducted by FLNRORD adequate to determine the approximate number of new NOGO breeding areas to be protected on Crown land in the SCR and the DCK specifically. I recognize that managing for NOGO breeding areas can create operational constraints; however, designing effective breeding area reserves that maintain the occupancy of birds at their original breeding area is the best approach to minimize both planning time and constraints over the long-term. Therefore, in an effort to avoid investment uncertainty and maintain business continuity, it is my expectation that Licensees will proactively survey for NOGO nests in suitable breeding habitat in their operating areas during pre-planning stages and report the location of known nests to FLNRORD prior to initiating harvest operations. I also remind Licensees that active NOGO nests are protected under the provincial *Wildlife Act*, and that no-work zones should be established around active nests between February 15 and September 15 according to the Guidelines for Managing NOGO breeding areas in Coastal B.C.

FLNRORD will assist Licensees with their operational planning by providing a digital map of modeled NOGO nesting habitat suitability for each Landscape Unit for reference and review (see download instructions below). These maps should be used to help guide where pre-planning surveys should be completed on the land base. Standard surveys must be conducted by a Registered Professional Biologist (RPBio) in B.C. and should be coordinated with the FLNRORD NOGO inventory team by contacting Melanie Wilson (Wildlife Biologist; 604-586-5649 or Melanie.L.Wilson@gov.bc.ca) to discuss possible efficiencies in survey planning and effort. By following this process, FLNRORD and Licensees can work collaboratively to identify NOGO breeding areas and propose effective WHAs that minimize impacts to Licensees and the timber harvesting land base (THLB). We will also be hosting a training workshop at our Chilliwack office on the identification of NOGO habitat, nests, signs, and calls as well as reporting procedures for NOGO observations. This workshop is scheduled for March 4, 2019 from 1 to 4:30 PM. I recommend that you send a representative to this important workshop and contact Melanie for more information.

I conclude with the affirmation that it is the intent of FLNRORD to achieve the management direction outlined in the NOGO Implementation Plan while minimizing potential impacts to Licensees and the THLB. It is my expectation that Licensees will comply with the direction outlined in this letter for all future forest management planning and development within the Fraser TSA. Should you have

³ Available: http://jem-online.org/images/PDFs/JEM_VOL_15_NO_2.pdf

questions, I ask that you contact me at 604-702-5700 or Mike.Peters@gov.bc.ca; or Daniel Guertin (Senior Wildlife Biologist) at 604-586-2729 or by email at Daniel.Guertin@gov.bc.ca.

Yours truly,

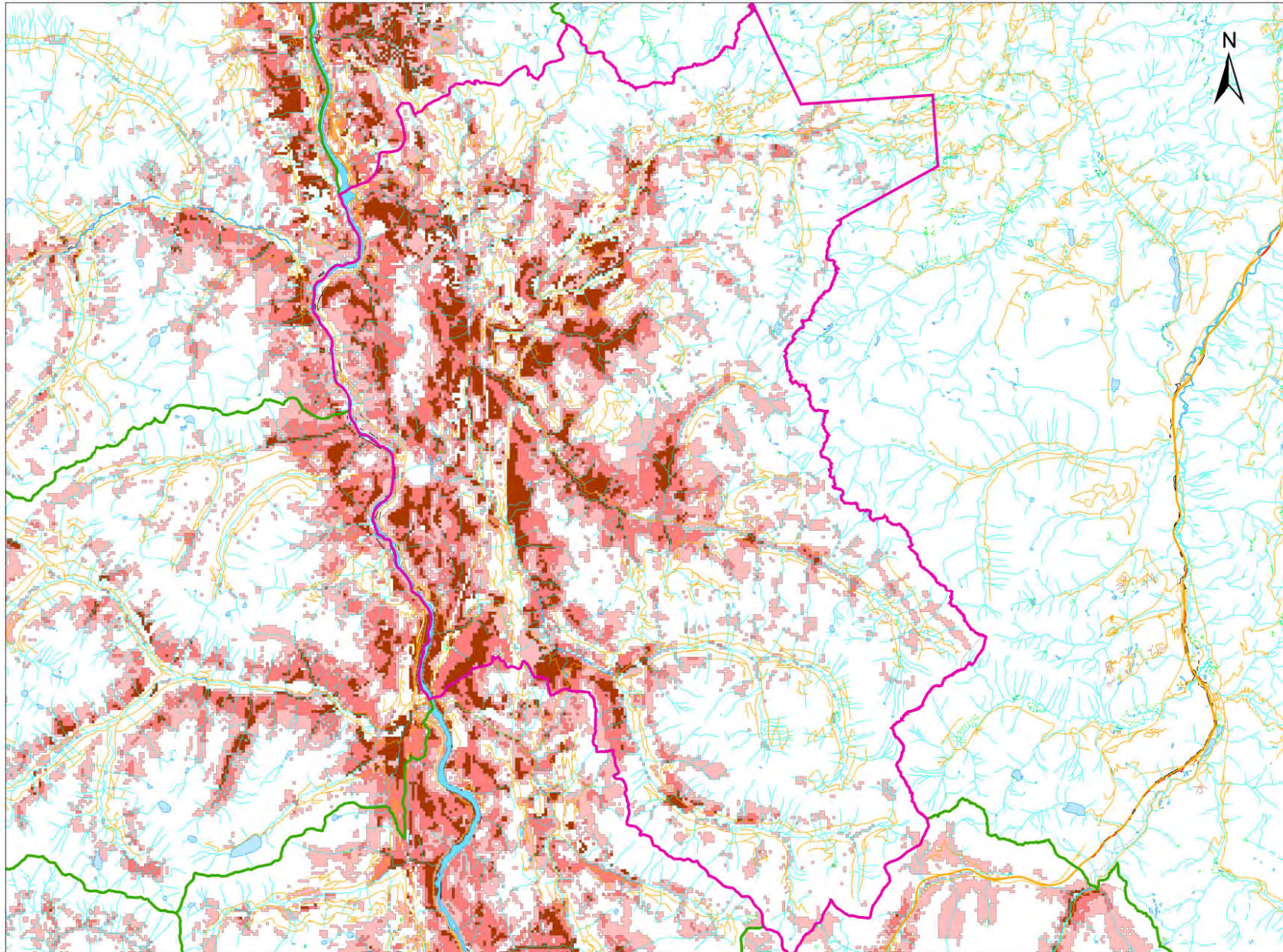
Mike Peters
District Manager
Chilliwack Natural Resource District

*****Instructions for Downloading Digital NOGO Nesting Habitat Maps*****

Digital maps of NOGO nesting habitat in the DCK by Landscape Unit are available for download from the FLNRORD DCK FTP site. Please also download and review the 'Caveats for Use' document. To connect to the FTP server, please following the link below.

ftp://ftp.for.gov.bc.ca/DCK/external!/publish/NOGO_MAPS/

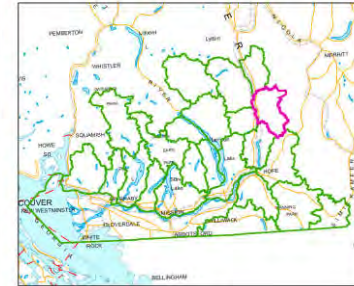
Northern Goshawk Nesting Habitat in the Chilliwack Natural Resource District



Landscape Unit Name:

Anderson

This model represents the best available predictive habitat suitability and supply models for Northern Goshawk in coastal BC. The model was designed to be applied for strategic planning to predict generalized patterns of habitat supply and configurations at landscape scales. If the model outputs are used for operational management, such as outblock layout/evaluation, ground-verification is recommended.



LEGEND

Landscape Unit Boundary

Nesting Habitat Suitability Class

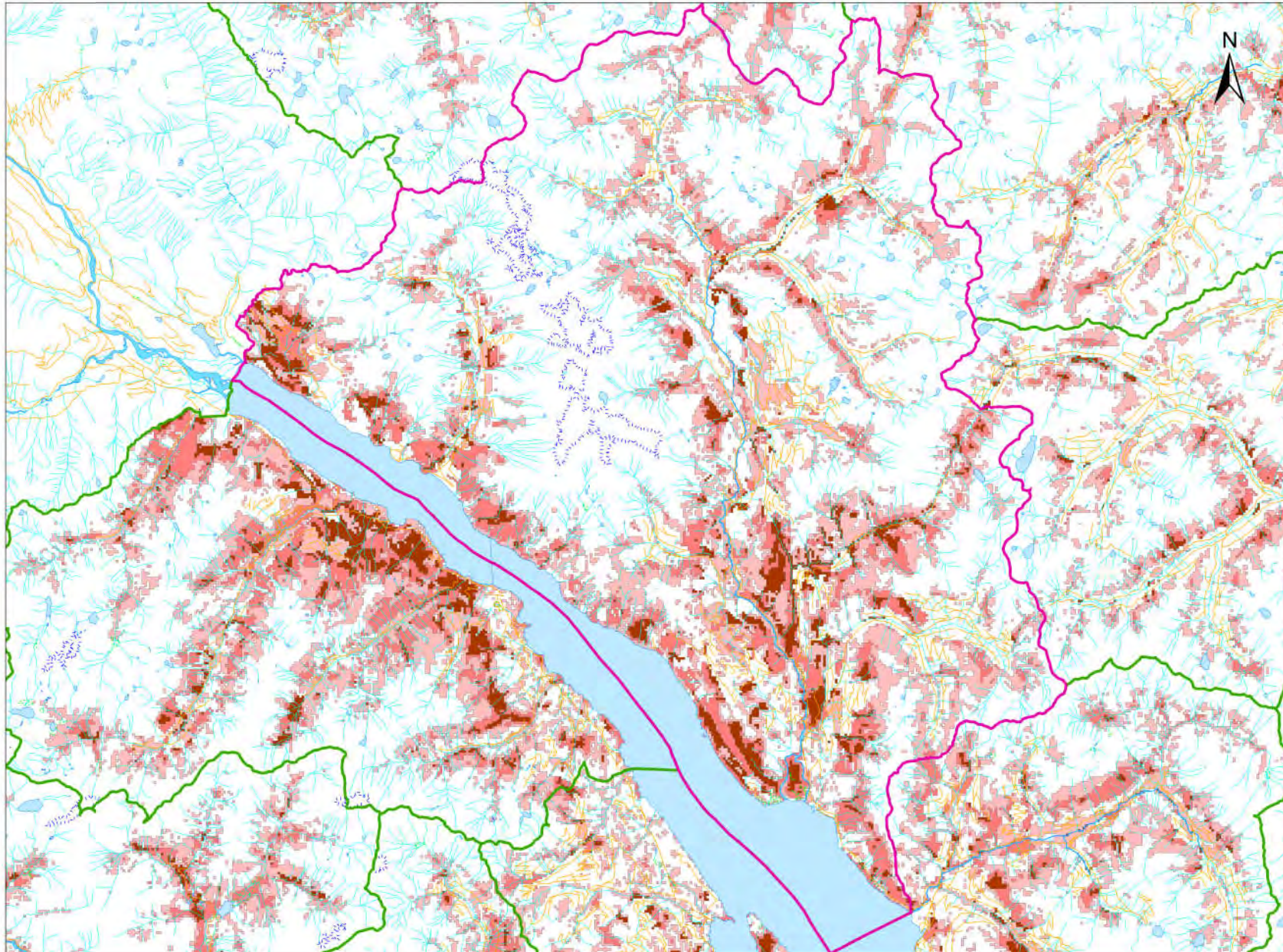
- Nil
- Low
- Medium
- High

0 1.75 3.5 7 Kilometers



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 Projection/Datum: BC_Environment_Abers\NAD 83
 Date Created: 2011/02/07
 Created for: South Coast Natural Resource Region

Northern Goshawk Nesting Habitat in the Chilliwack Natural Resource District




Landscape Unit Name:
Big Silver

This model represents the best available predictive habitat suitability and supply models for Northern Goshawk in coastal BC. The model was designed to be applied for strategic planning to predict generalized patterns of habitat supply and configurations at landscape scales. If the model outputs are used for operational management, such as cutblock layout/evaluation, ground-verification is recommended.



LEGEND

 Landscape Unit Boundary

Nesting Habitat Suitability Class

-  Nil
-  Low
-  Medium
-  High

0 2 4 8 Kilometers

 **BRITISH COLUMBIA** | Ministry of
Forests, Lands, Natural
Resource Operations
and Rural Development

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ResourceMgmt\NorthernGoshawk\mxd\NOGO_DCK.mxd
Projection/Datum: BC_Environment_Albers/NAD 83
Date Created: 2019/02/07
Created for: South Coast Natural Resource Region

Northern Goshawk Nesting Habitat in the Chilliwack Natural Resource District




Landscape Unit Name:
Chehalis

This model represents the best available predictive habitat suitability and supply models for Northern Goshawk in coastal BC. The model was designed to be applied for strategic planning to predict generalized patterns of habitat supply and configurations at landscape scales. If the model outputs are used for operational management, such as outblock layout/evaluation, ground-verification is recommended.



LEGEND

 Landscape Unit Boundary

Nesting Habitat Suitability Class

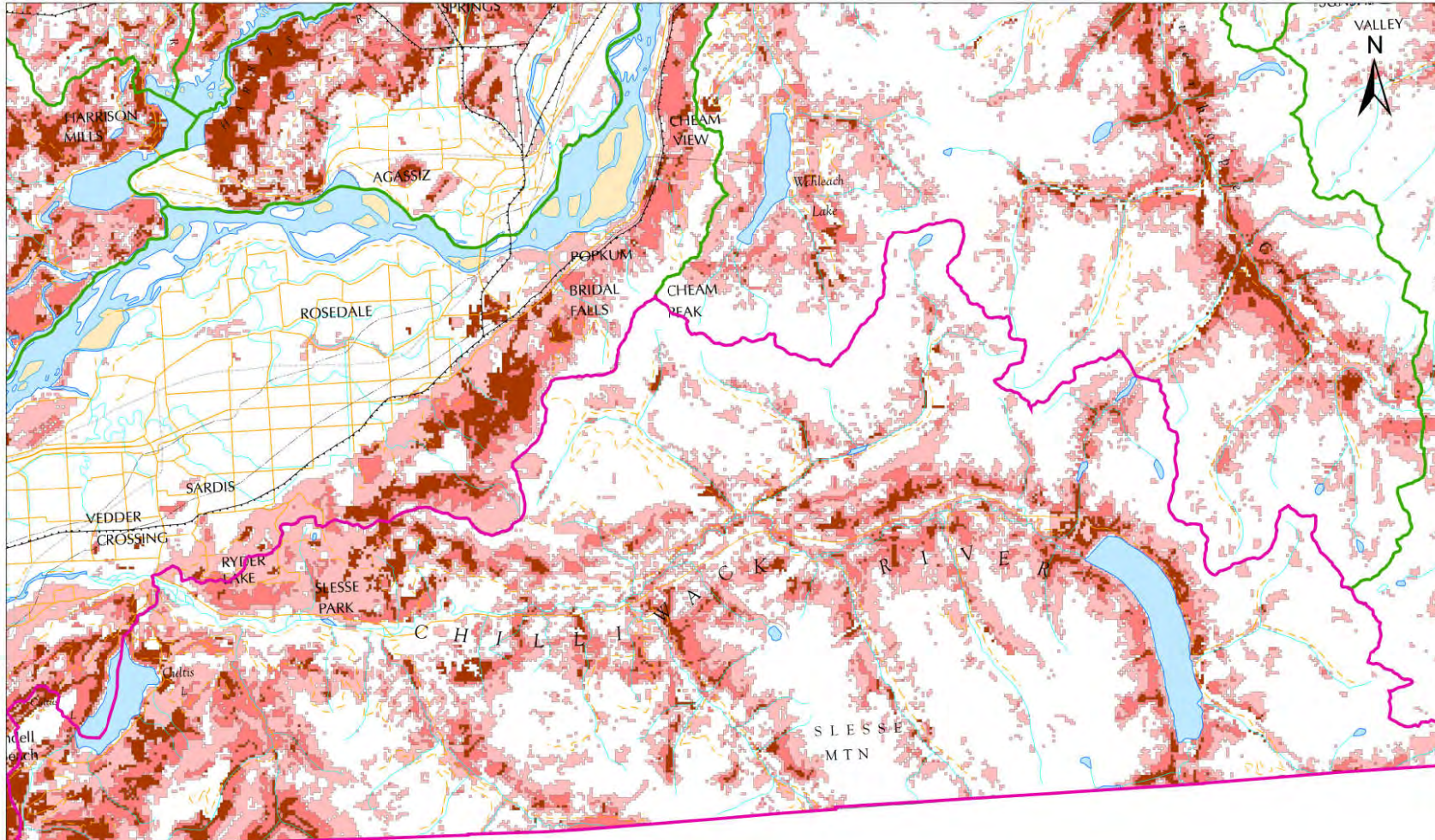
-  Nil
-  Low
-  Medium
-  High

0 1.75 3.5 7 Kilometers

 **BRITISH COLUMBIA** | Ministry of Forests, Lands, Natural Resource Operations and Rural Development

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Date Created: 2019/02/07
Created for: South Coast Natural Resource Region

Northern Goshawk Nesting Habitat in the Chilliwack Natural Resource District



Landscape Unit Name:
Chilliwack

This model represents the best available predictive habitat suitability and supply models for Northern Goshawk in coastal BC. The model was designed to be applied for strategic planning to predict generalized patterns of habitat supply and configurations at landscape scales. If the model outputs are used for operational management, such as outblock layout/evaluation, ground-verification is recommended.



LEGEND

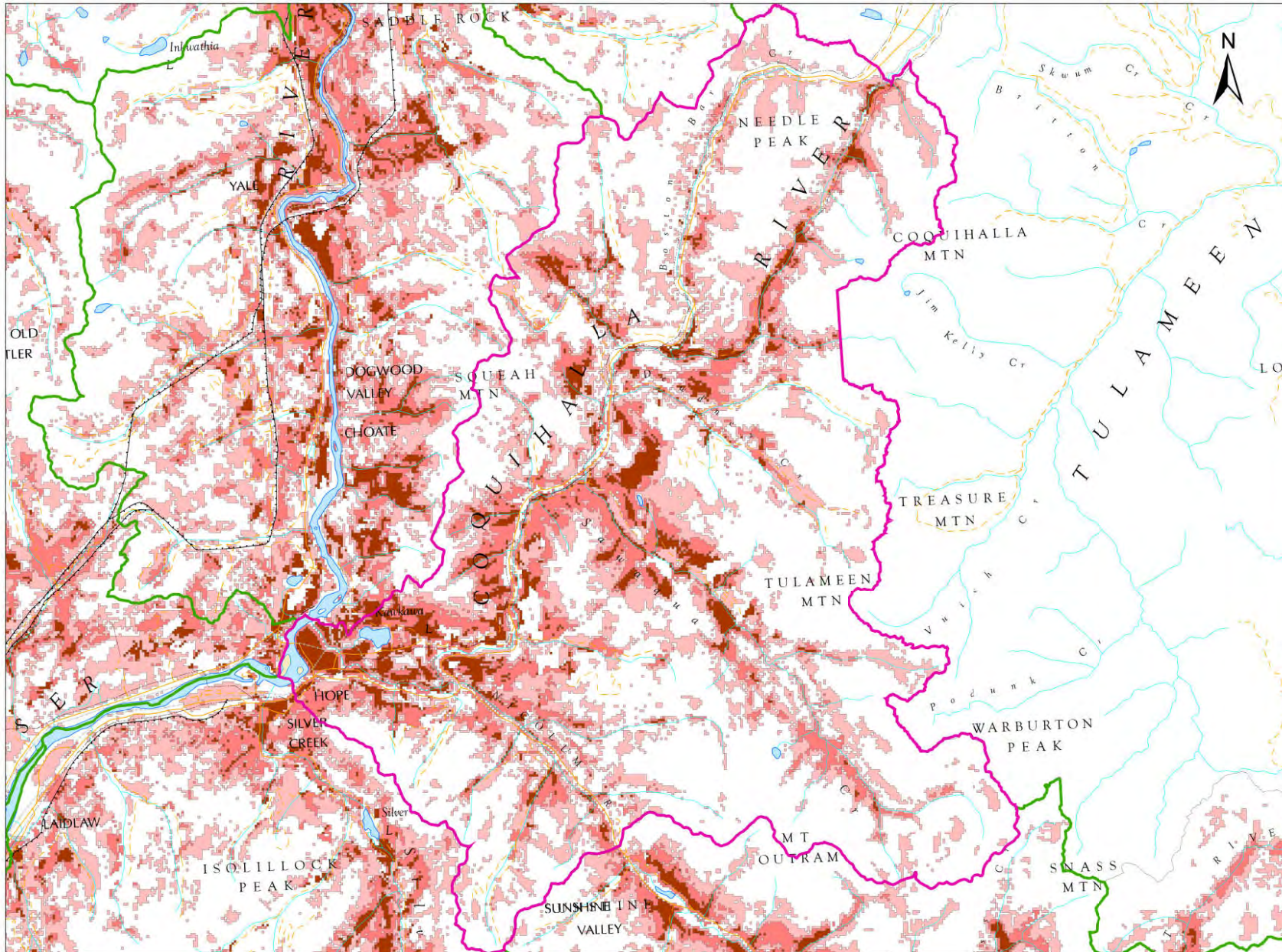
- Landscape Unit Boundary
- Nesting Habitat Suitability Class**
- Nil
- Low
- Medium
- High

0 2 4 8
Kilometers



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Projection/Datum: BC_Environment_Abers\NAD 83
Date Created: 2019/02/07
Created for: South Coast Natural Resource Region

Northern Goshawk Nesting Habitat in the Chilliwack Natural Resource District



Landscape Unit Name:
Coquihalla

This model represents the best available predictive habitat suitability and supply models for Northern Goshawk in coastal BC. The model was designed to be applied for strategic planning to predict generalized patterns of habitat supply and configurations at landscape scales. If the model outputs are used for operational management, such as outblock layout/evaluation, ground-verification is recommended.



LEGEND

Landscape Unit Boundary

Nesting Habitat Suitability Class

- Nil
- Low
- Medium
- High

0 2 4 8
Kilometers

BRITISH COLUMBIA | Ministry of Forests, Lands, Natural Resource Operations and Rural Development

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Date Created: 2013/02/07
Created for: South Coast Natural Resource Region

Northern Goshawk Nesting Habitat in the Chilliwack Natural Resource District



Landscape Unit Name:
East Harrison

This model represents the best available predictive habitat suitability and supply models for Northern Goshawk in coastal BC. The model was designed to be applied for strategic planning to predict generalized patterns of habitat supply and configurations at landscape scales. If the model outputs are used for operational management, such as outblock layout/evaluation, ground-verification is recommended.



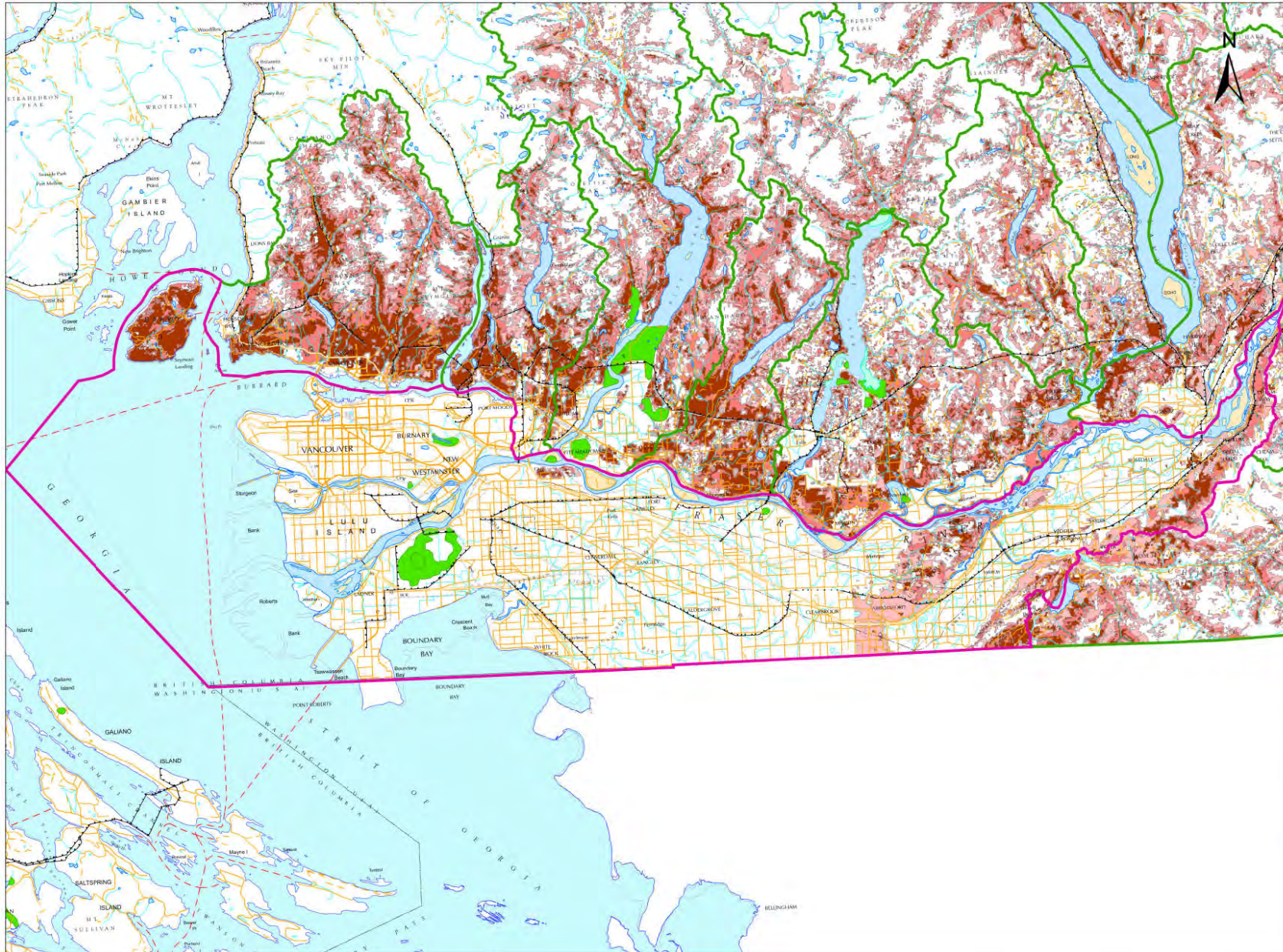
LEGEND

- Landscape Unit Boundary
- Nesting Habitat Suitability Class**
- Nil
- Low
- Medium
- High



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Projection/Datum: BC_Environment_Albers/NAD 83
Date Created: 2019/02/07
Created for: South Coast Natural Resource Region

Northern Goshawk Nesting Habitat in the Chilliwack Natural Resource District



Landscape Unit Name:
Fraser Valley South

This model represents the best available predictive habitat suitability and supply models for Northern Goshawk in coastal BC. The model was designed to be applied for strategic planning to predict generalized patterns of habitat supply and configurations at landscape scales. If the model outputs are used for operational management, such as outblock layout/evaluation, ground-verification is recommended.



LEGEND

Landscape Unit Boundary

Nesting Habitat Suitability Class

- Nil
- Low
- Medium
- High

0 5 10 20
Kilometers



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Date Created: 2018/02/07
Created for: South Coast Natural Resource Region

Northern Goshawk Nesting Habitat in the Chilliwack Natural Resource District



Landscape Unit Name:
Hatzic

This model represents the best available predictive habitat suitability and supply models for Northern Goshawk in coastal BC. The model was designed to be applied for strategic planning to predict generalized patterns of habitat supply and configurations at landscape scales. If the model outputs are used for operational management, such as outblock layout/evaluation, ground-verification is recommended.



LEGEND

Landscape Unit Boundary

Nesting Habitat Suitability Class

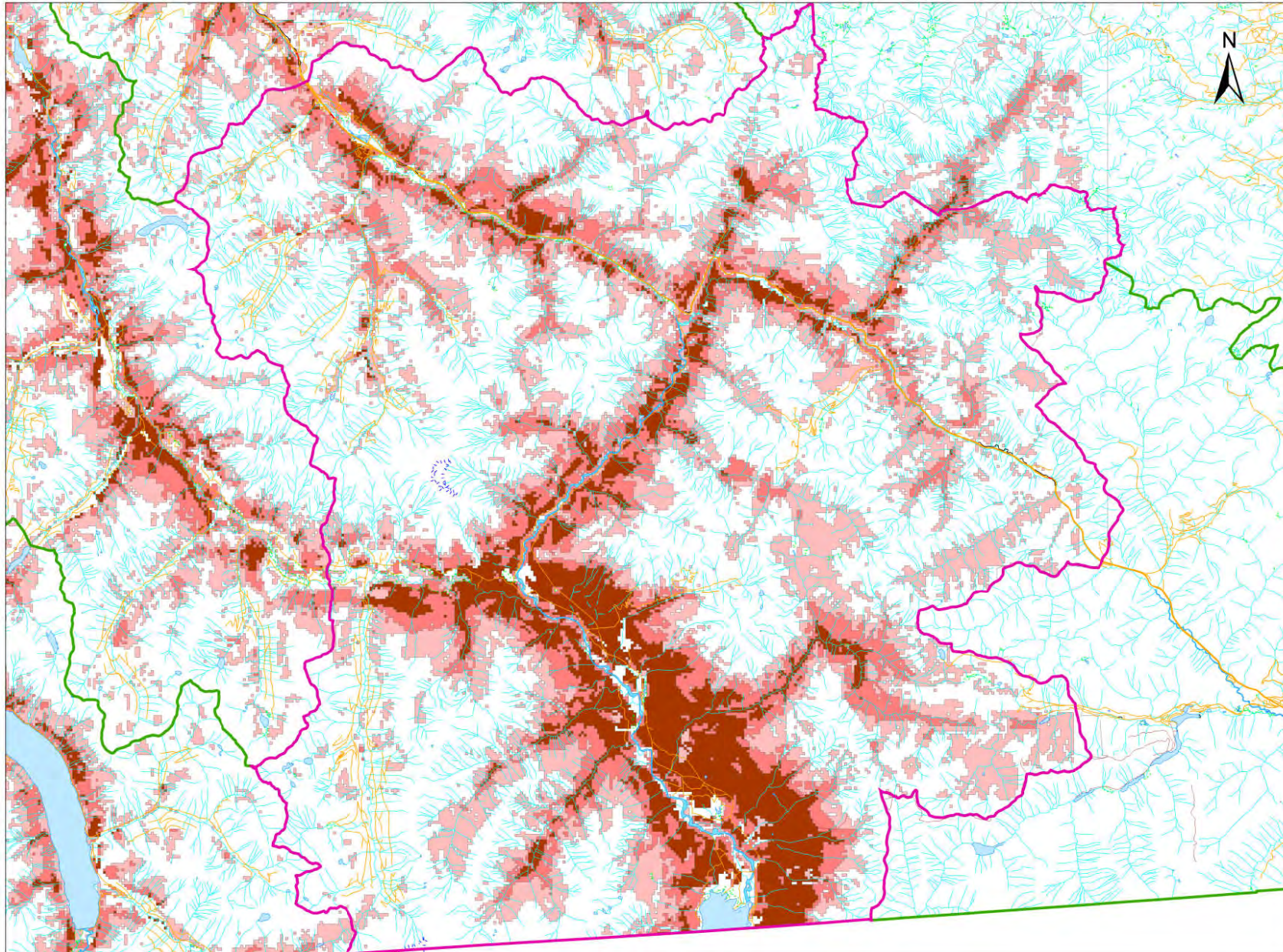
- Nil
- Low
- Medium
- High

0 1.75 3.5 7 Kilometers

BRITISH COLUMBIA | Ministry of Forests, Lands, Natural Resource Operations and Rural Development

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Date Created: 2019/02/07
Created for: South Coast Natural Resource Region

Northern Goshawk Nesting Habitat in the Chilliwack Natural Resource District



Landscape Unit Name:
Manning

This model represents the best available predictive habitat suitability and supply models for Northern Goshawk in coastal BC. The model was designed to be applied for strategic planning to predict generalized patterns of habitat supply and configurations at landscape scales. If the model outputs are used for operational management, such as cutblock layout/evaluation, ground-verification is recommended.



LEGEND

Landscape Unit Boundary

Nesting Habitat Suitability Class

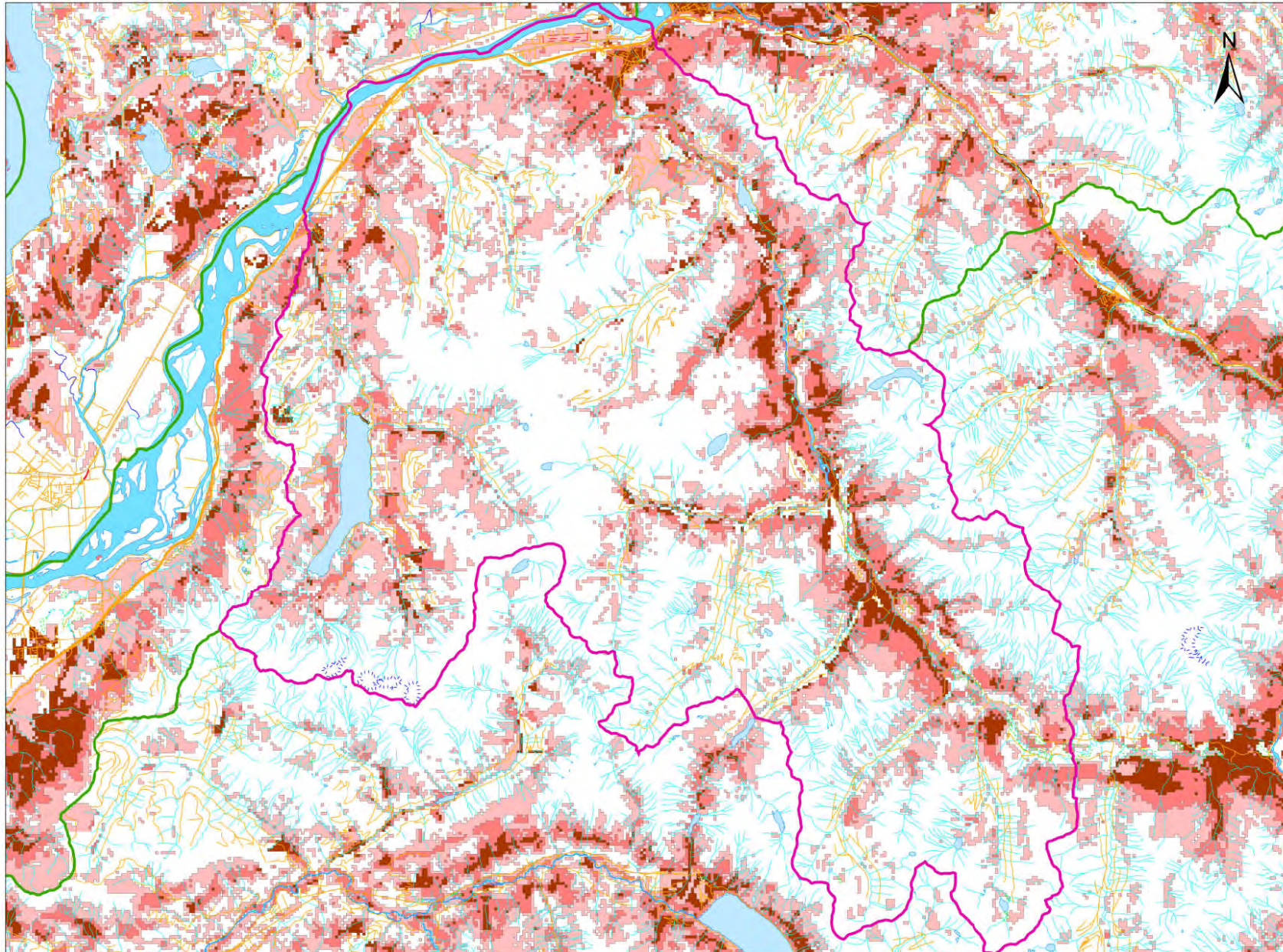
- Nil
- Low
- Medium
- High

0 1.75 3.5 7 Kilometers

BRITISH COLUMBIA | Ministry of Forests, Lands, Natural Resource Operations and Rural Development

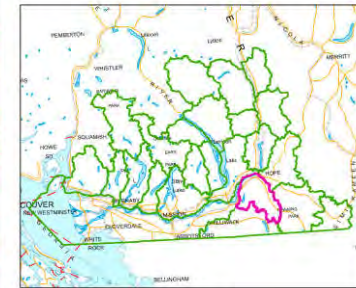
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Projection/Datum: BC_Environment_Albers/NAD 83
Date Created: 2019/02/07
Created for: South Coast Natural Resource Region

Northern Goshawk Nesting Habitat in the Chilliwack Natural Resource District



Landscape Unit Name:
Silverhope

This model represents the best available predictive habitat suitability and supply models for Northern Goshawk in coastal BC. The model was designed to be applied for strategic planning to predict generalized patterns of habitat supply and configurations at landscape scales. If the model outputs are used for operational management, such as cutblock layout/evaluation, ground-verification is recommended.



LEGEND

Landscape Unit Boundary

Nesting Habitat Suitability Class

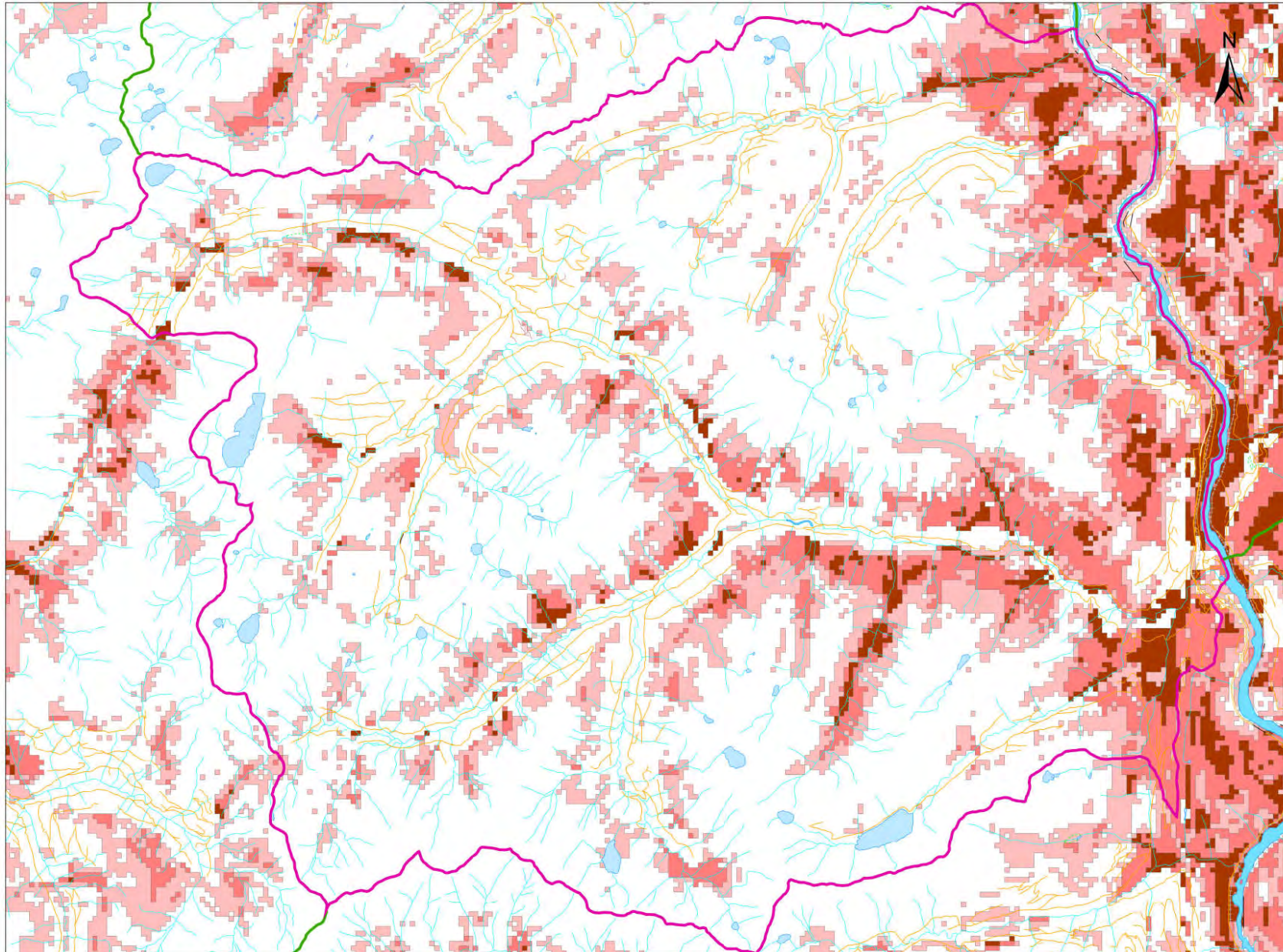
- Nil
- Low
- Medium
- High

0 1.75 3.5 7 Kilometers



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 Projection/Datum: BC_Environment_Abers\NAD 83
 Date Created: 2013/02/07
 Created for: South Coast Natural Resource Region

Northern Goshawk Nesting Habitat in the Chilliwack Natural Resource District




Landscape Unit Name:
Spuzzum

This model represents the best available predictive habitat suitability and supply models for Northern Goshawk in coastal BC. The model was designed to be applied for strategic planning to predict generalized patterns of habitat supply and configurations at landscape scales. If the model outputs are used for operational management, such as outblock layout/evaluation, ground-verification is recommended.




LEGEND

 Landscape Unit Boundary

Nesting Habitat Suitability Class

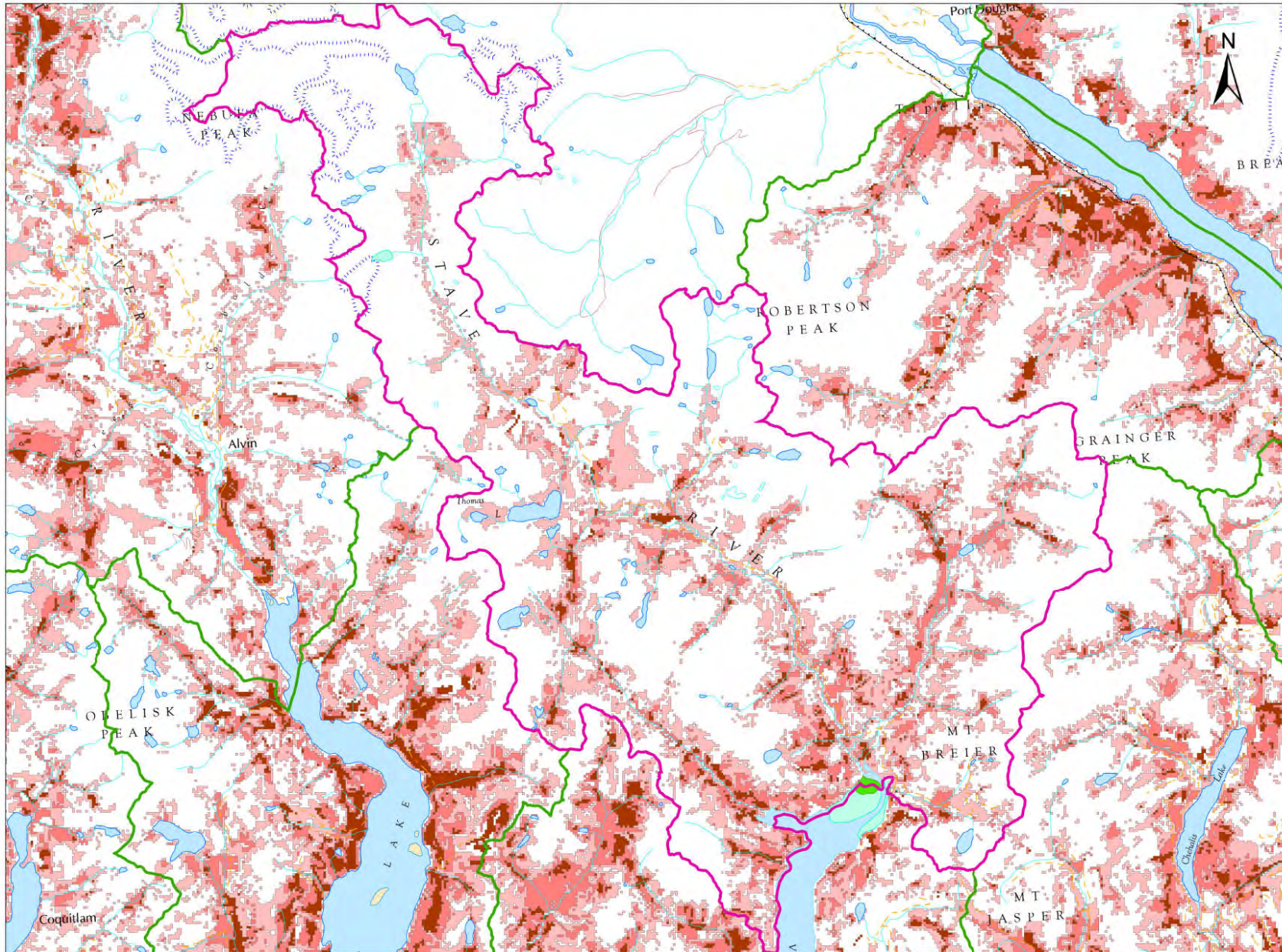
-  Nil
-  Low
-  Medium
-  High

0 1 2 4 Kilometers

 **Ministry of
Forests, Lands, Natural
Resource Operations
and Rural Development**

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Date Created: 2011/02/07
Created for: South Coast Natural Resource Region

Northern Goshawk Nesting Habitat in the Chilliwack Natural Resource District



Landscape Unit Name:
Stave

This model represents the best available predictive habitat suitability and supply models for Northern Goshawk in coastal BC. The model was designed to be applied for strategic planning to predict generalized patterns of habitat supply and configurations at landscape scales. If the model outputs are used for operational management, such as outblock layout/evaluation, ground-verification is recommended.



LEGEND

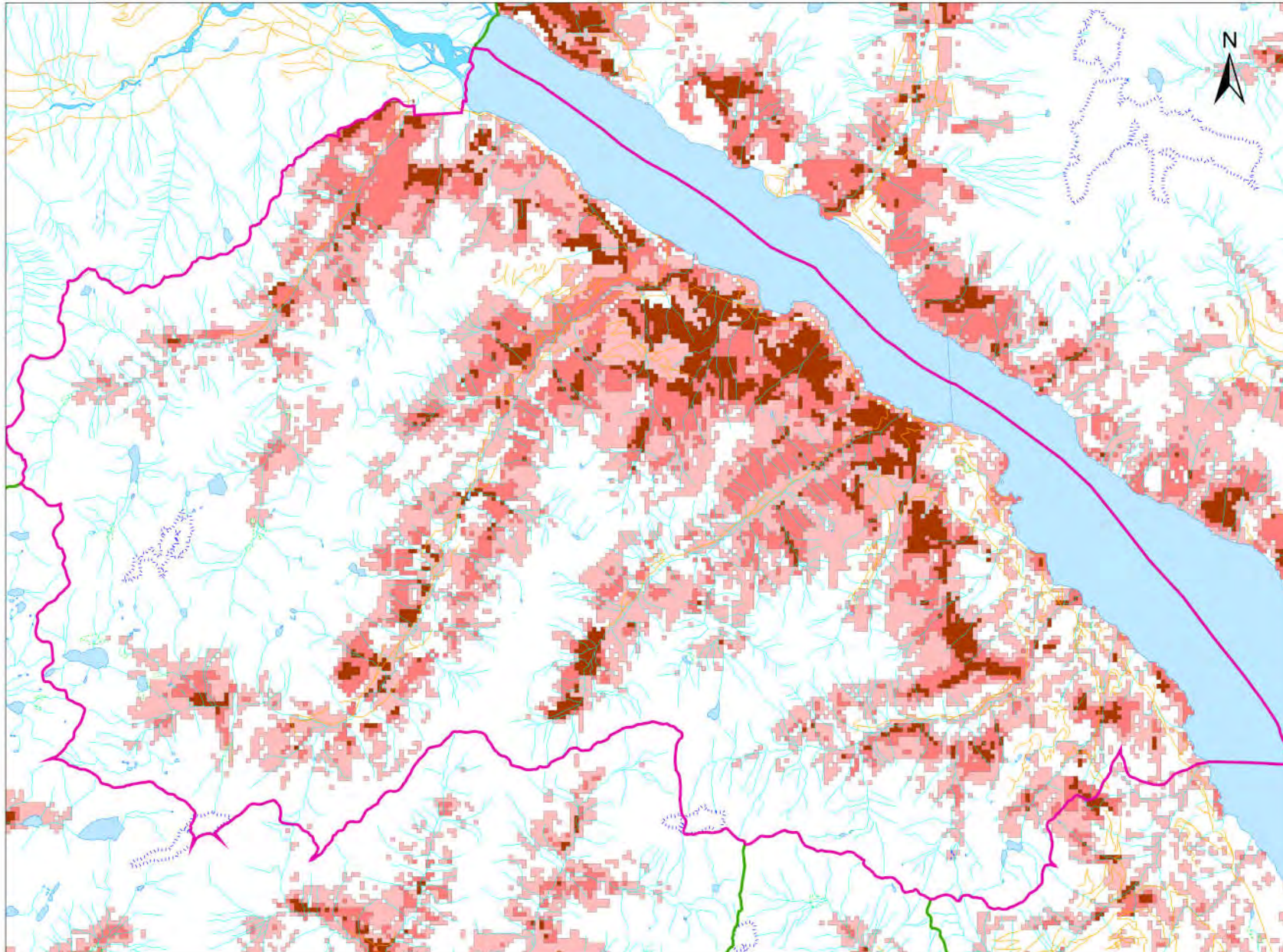
- Landscape Unit Boundary
- Nesting Habitat Suitability Class**
- Nil
- Low
- Medium
- High

0 2 4 8 Kilometers



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Date Created: 2011/02/07
Created for: South Coast Natural Resource Region

Northern Goshawk Nesting Habitat in the Chilliwack Natural Resource District




Landscape Unit Name:
Tretheway

This model represents the best available predictive habitat suitability and supply models for Northern Goshawk in coastal BC. The model was designed to be applied for strategic planning to predict generalized patterns of habitat supply and configurations at landscape scales. If the model outputs are used for operational management, such as outblock layout/evaluation, ground-verification is recommended.



LEGEND

 Landscape Unit Boundary

Nesting Habitat Suitability Class

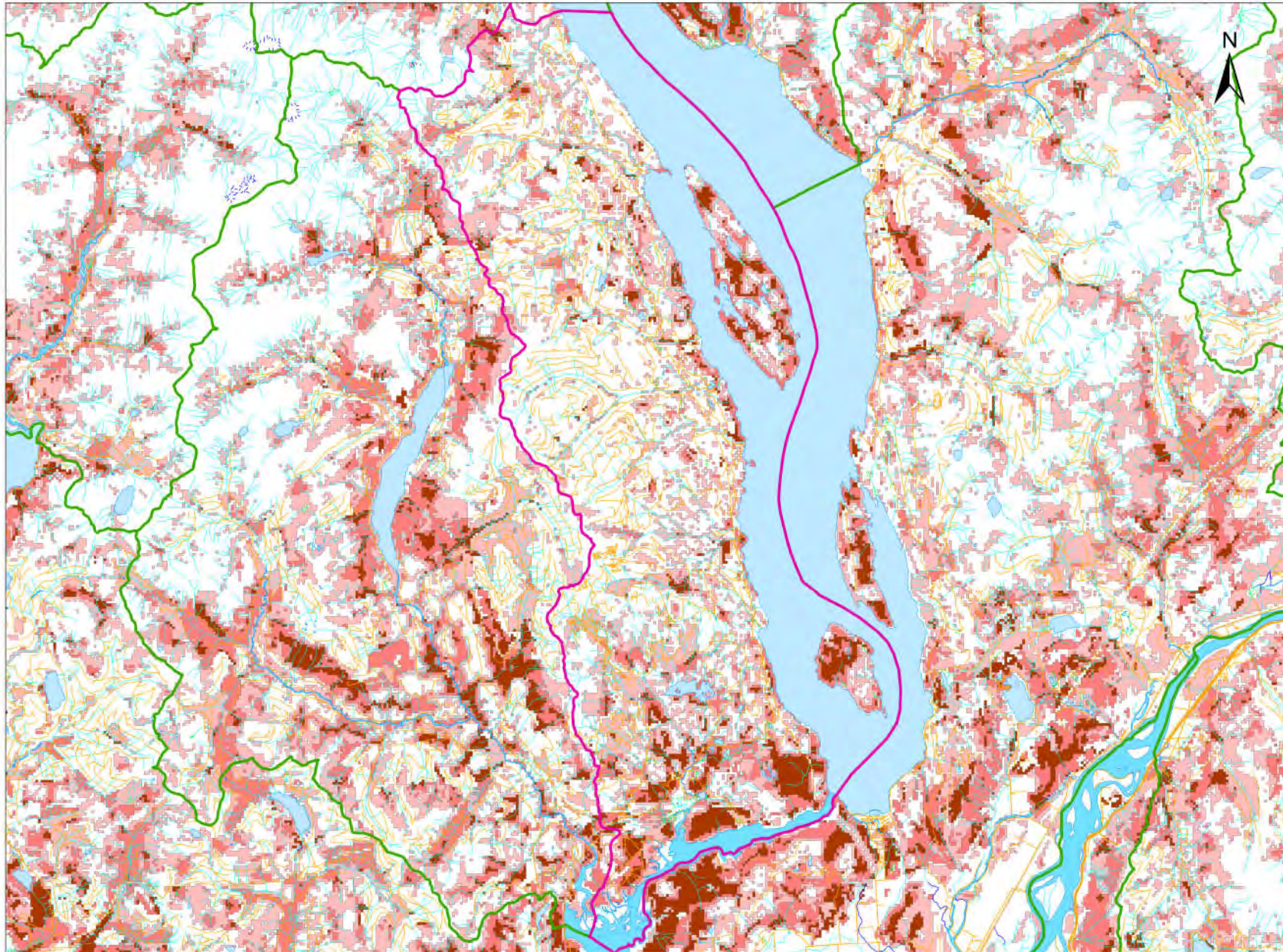
-  Nil
-  Low
-  Medium
-  High

0 1 2 4 Kilometers

 **BRITISH COLUMBIA** | Ministry of Forests, Lands, Natural Resource Operations and Rural Development

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Projection/Datum: BC_Environment_Albers/NAD 83
Date Created: 2019/02/07
Created for: South Coast Natural Resource Region

Northern Goshawk Nesting Habitat in the Chilliwack Natural Resource District



Landscape Unit Name:
West Harrison

This model represents the best available predictive habitat suitability and supply models for Northern Goshawk in coastal BC. The model was designed to be applied for strategic planning to predict generalized patterns of habitat supply and configurations at landscape scales. If the model outputs are used for operational management, such as outblock layout/evaluation, ground-verification is recommended.



LEGEND

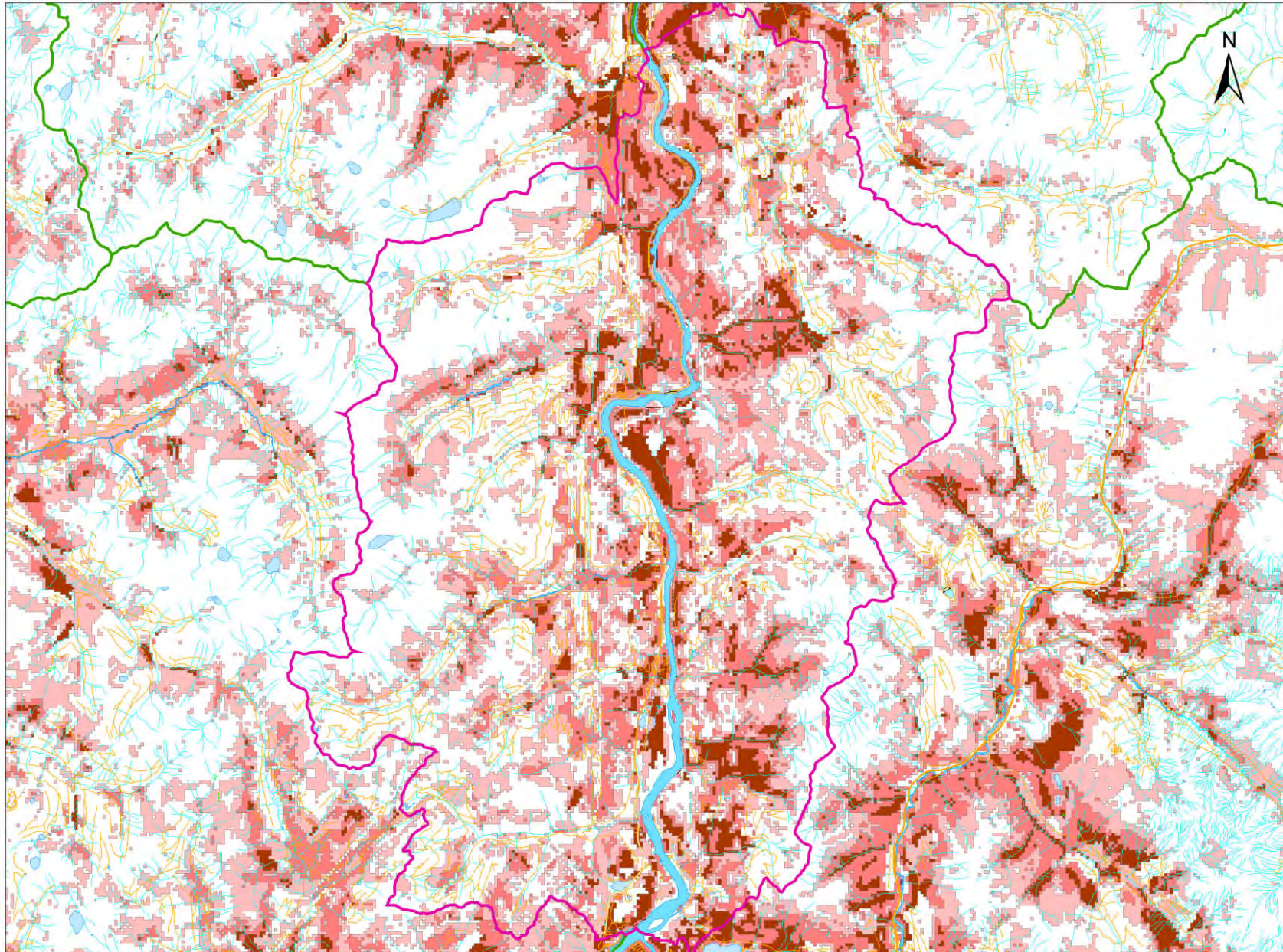
- Landscape Unit Boundary
- Nesting Habitat Suitability Class**
- Nil
- Low
- Medium
- High

0 1.75 3.5 7 Kilometers



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Projection/Datum: BC_Environment_Albers/NAD 83
Date Created: 2019/02/07
Created for: South Coast Natural Resource Region

Northern Goshawk Nesting Habitat in the Chilliwack Natural Resource District



Landscape Unit Name:
Yale

This model represents the best available predictive habitat suitability and supply models for Northern Goshawk in coastal BC. The model was designed to be applied for strategic planning to predict generalized patterns of habitat supply and configurations at landscape scales. If the model outputs are used for operational management, such as outblock layout/evaluation, ground-verification is recommended.



LEGEND

- Landscape Unit Boundary
- Nesting Habitat Suitability Class**
- Nil
- Low
- Medium
- High

0 1.5 3 6 Kilometers



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 Projection/Datum: BC_Environment_Abers/NAD 83
 Date Created: 2013/02/07
 Created for: South Coast Natural Resource Region



ORDER – WILDLIFE HABITAT AREAS
Northern Goshawk (*Accipiter gentilis laingi*)

Table 1. Chilliwack and Sunshine Coast Forest District Wildlife Habitat Areas

WHA Tag	Forest District ¹					
	DCK	DSC				
	2-671	2-673	2-675	2-676	2-677	2-678

¹ DCK = Chilliwack Forest District; DSC = Sunshine Coast Forest District

This Order is given under the authority of sections 9(2) and 10(1) of the *Government Actions Regulation* (B.C. Reg. 582/2004) (GAR).

1. The delegated decision maker, being satisfied that
 - i. the following area contains habitat that is necessary to meet the nesting habitat requirements of a species at risk – Northern Goshawk (*Accipiter gentilis laingi*); and
 - ii. the habitat requires special management that is not otherwise provided for under GAR or another enactment;
 orders that
 - a) the areas shown in the map set out in the attached Schedule A (and listed in Table 1 above) and contained in the WHA spatial layer stored in the Geographic Warehouse (WHSE_WILDLIFE_MANAGEMENT.WCP_WILDLIFE_HABITAT_AREA_POLY) are established as wildlife habitat areas (see Table 1 above) for Northern Goshawk. The centre point of the line on the attached Schedule A is what establishes the WHAs; and
 - b) if there is a discrepancy between the areas shown in the map set out in the attached Schedule A and the WHA spatial layer stored in the Geographic Warehouse (WHSE_WILDLIFE_MANAGEMENT.WCP_WILDLIFE_HABITAT_AREA_POLY, the areas as detailed in the WHA spatial layer will take precedent; and
 - c) Pursuant to section 7(3) of the *Forest Planning and Practices Regulation* the person(s) required to prepare a forest stewardship plan are hereby exempted from the obligation to prepare results or strategies in relation to the objective set out in section 7(1) of the *Forest Planning and Practices Regulation* to the extent that the WHAs (see Table 1 above) address the amount included for Northern Goshawk in the Notice for the Sunshine Coast Natural Resource District.

2. The delegated decision maker, being satisfied that
 - i. the general wildlife measures (GWMs) described below are necessary to protect or conserve the Northern Goshawks and the habitat of Northern Goshawk; and
 - ii. GAR or another enactment does not otherwise provide for that protection or conservation;
 orders that
 - a) the GWMs outlined in Schedule 1 are established for the 6 WHAs listed in Table 1.

Definitions:

Words and expressions not defined in this Order have the meaning given to them in the *Forest and Range Practices Act* (FRPA) and the regulations made under it, unless context indicates otherwise.

Schedule 1 – General Wildlife Measures

Access

- 1) Do not construct roads, trails, landings or stream crossings in the WHA.
- 2) GWM 1 does not apply if construction of Road Sections C39W-A and C39W-B under Road Permit R21584 is required through WHA 2-676 for the purposes of accessing timber beyond the boundaries of the WHA.

Harvesting and Silviculture

- 3) Do not conduct timber harvesting or silviculture treatments, except as specified in GWMs 4 and 5.
- 4) GWM 3 does not apply where:
 - a) guyline anchors and tailholds are required to facilitate worker safety during adjacent timber harvesting;
 - b) trees are felled in accordance with Section 2(3) of the *Forest Planning and Practices Regulation*; or,
 - c) silviculture treatments are required in legacy blocks to establish a free growing stand as per Section 29(2) of the *Forest and Range Practices Act*.
- 5) Trees felled in accordance with GWM 4 that fall within a WHA must be retained on-site to provide coarse woody debris.

Pesticides

- 6) Do not use pesticides, except for herbicides to control invasive plants or noxious weeds, if applied by:
 - a) stem injection, cut and paint, foliar wipe or other direct plant application; or
 - b) spot spraying individual plants or a cluster of plants if direct plant application is not practicable.



Signed this 22nd day of May, 2020

Craig Sutherland, Assistant Deputy Minister, Coast Area

Ministry of Forests, Lands, Natural Resource Operations & Rural Development

Appendix 1:

The following information is provided as background information and support to the Order establishing 6 WHAs in **Table 1**. This appendix is not part of the order.

These recommendations are intended to provide guidance to minimize direct disturbance to goshawks by outlining recommended distances and timing windows for a variety of activities that have the potential to disturb the birds.

Minimizing Direct Disturbance

As goshawks may nest in different locations each year within their breeding areas, attempts should be made by a qualified professional to locate the active nest and implement measures to minimize impacts during the goshawk breeding season. Goshawks, their eggs and their nests, when occupied by a bird or its egg, are protected under Section 34 of the *Wildlife Act*.

As the location of an active nest may not be known, these guidelines apply during the breeding season to all known nests within a goshawk territory, unless a nest check and appropriate goshawk survey(s) by a qualified professional are done during the breeding season and the nest is determined to be unoccupied or no longer exists.

Timing Restrictions

Minimize the risk of nest failure or abandonment from direct disturbance by following the timing restrictions and setback distances in Section 8.4 of in *Science-Based Guidelines for Managing Northern Goshawk Breeding Areas in Coastal British Columbia* (McClaren *et al.* 2015).¹

Table 2. Recommended minimum distance to keep activities away from the nearest active coastal goshawk nest site during periods of high and moderate risk (February 15 to September 15) (from McClaren *et al.* 2015)

Likelihood of Impact	Activity	Timing Restriction Distance ^a
Very high	<ul style="list-style-type: none">• Repeated low-elevation flights (< 305 m)• Blasting• Continuously operating drilling rig or well flaring	More than 1 km
High	<ul style="list-style-type: none">• Road-building (without blasting)• Logging• Pipeline and well-site construction• Detonation of seismic charges• Wind tower construction• Seismic line cutting (mechanical)	More than 500 m
Moderate	Hauling and road maintenance (logs, heavy equipment, etc.)	More than 100 m
Low	<ul style="list-style-type: none">• Silviculture activities (e.g., planting and site preparation)	More than 50 m, where practicable. Individual birds

¹ Available at: <http://jem-online.org/index.php/jem/article/viewFile/576/506>

	<ul style="list-style-type: none"> • Seismic line cutting (manual) • Industrial and public traffic 	<p>and young may be affected by these activities. If birds seem distressed (i.e., continuous calling, birds staying away from active nest, aggressive behaviours toward people/equipment, etc.), then the activity should cease until at least July 1.</p>
--	--	--

^a This is the distance from the known nest site within which timing restrictions should be applied. Any activities that are farther away than this distance do not need to apply timing restrictions. Individual goshawks will vary in their response to disturbance levels, depending on several factors that include habitat characteristics, breeding chronology, age, and individual variation.

Appendix 2:

1. **Activities to which the Order does not apply:** Section 2(2) of the *Government Actions Regulation* states:

An Order under any of sections 5 to 15 does not apply in respect of

- a. any of the following entered into before the Order takes effect:
 - i. a cutting permit;
 - ii. a road permit;
 - iii. a timber sale licence that does not provide for cutting permits;
 - iv. a forestry licence to cut issued by a timber sales manager under section 47.6 (3) of the *Forest Act*;
 - v. subject to subsection (3), a minor tenure,
- b. a declared area,
- c. areas described in section 196 (1) of the Act, and
- d. areas referred to in section 110 of the *Forest Planning and Practices Regulation*.

2. Authority to consider an exemption from these GWMs is provided in Section 92(1) of the *Forest Planning and Practices Regulation*, Section 79(1) of the *Woodlot License Planning and Practices Regulation*, and Section 36(3) of the *Range Planning and Practices Regulation*. An exemption may be provided if the Minister's delegate is satisfied that the intent of the GWM will be achieved or that compliance with the provision is not practicable, given the circumstances or conditions applicable to a particular area. In this situation, the delegated decision maker may also consider if the exemption affects critical habitat since the federal Recovery Strategy is approved and the province is expected to demonstrate effective protection of that habitat.

An exemption application should be submitted to the Minister's delegate (FLNRORD, Director of Resource Management) for the region that the WHA is located with a rationale describing the nature of the problem and options to integrate Northern Goshawk habitat conservation with proposed forest practices. This submission will assist in timely consideration of the matter, and will inform the conditions, if any, of the exemption that may be granted prior to commencement of activities. Upon receipt of a complete exemption application, a determination will normally be made within 14 calendar days of arrival at the FLNRORD regional office. Incomplete packages will be returned to the proponent for re-submission.

3. The minister responsible for the *Wildlife Act*, or their delegate, may amend a WHA order, including the legal boundaries designated in the order. The delegated decision maker for minor boundary amendments is the Director Resource Management, FLNRORD. Minor boundary amendment request applications are submitted to a FLNRORD regional biologist familiar with the WHA. Once an agreement has been reached on the location of the new boundary to the extent possible, the boundary amendment request is submitted to the Director Resource Management for that region with the necessary supporting information. The delegated decision maker for major boundary amendments remains the Deputy Minister, FLNRORD. Major boundary amendments are submitted by the regional biologist to FLNRORD Victoria staff who will bring the proposed change to the Deputy Minister, FLNRORD. The delegated decision maker may also consider if the exemption affects critical habitat since the federal Recovery Strategy is approved and the province is expected to demonstrate effective protection of that habitat.

The boundary amendment application must include a rationale describing the nature of the problem and any options to integrate Northern Goshawk habitat conservation measures with the proposed boundary, digital map files of the current boundary, and digital map files for the proposed boundary. This submission will assist in timely consideration of the matter, and will inform the conditions (e.g., replacement area), if any, of the boundary amendment that may be considered prior to amending the order. Determination and notification will generally be made within 30 days of receipt of a complete application. Incomplete packages will be returned to the proponent for re-submission.

4. Anyone required to implement this Order should also be aware of potential overlap between these WHAs and other wildlife Orders (e.g., other WHA Orders, Ungulate Winter Range [UWR] Orders) or *Land Act* Orders (i.e. Old Growth Management Areas) and that there may be different GWMs or objectives that apply. If this occurs, it will be important to apply the most conservative GWM or objective for the overlapping area.
5. Where roads in the WHA are temporary and no longer required, they should be permanently deactivated. Proponents should notify the Director of Resource Management, South Coast Natural Resource Region, FLNRORD when deactivation of temporary roads is complete.
6. These GWMs do not apply to persons who must comply with the *Worker's Compensation Act* and the regulations under that Act (e.g., danger tree felling as per OH&S Regulation Part 26). Where a GWM cannot be achieved due to a safety concern, a person should consider developing a rationale related to the safety issue and keep it on file to be made available to a government official upon request. Consistent with section 2(3) of the FPPR, exemptions from these GWMs are not required to meet safety requirements.

**ORDER OF THE MINISTER OF LAND, WATER
AND RESOURCE STEWARDSHIP**

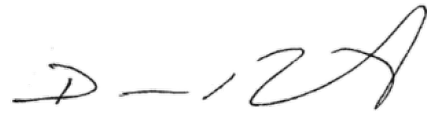
Forest and Range Practices Act

Ministerial Order No.

I, **Josie Osborne, Minister of Land, Water and Resource Stewardship**, being satisfied that the following described areas contain habitat that is necessary to meet the habitat requirements for Northern Goshawk (*Accipiter gentilis laingi*); and the habitat requires special management that is not otherwise provided for under the Government Action Regulation (GAR) or another enactment, order that wildlife habitat areas (WHAs); 2-696 and 2-697 in the Chilliwack Forest District, 2-672, 2-679, 2-681, 2-682, 2-683, 2-686 in the Sunshine Coast Forest District and 2-688, 2-689, 2-690, 2-691 and 2-698 in the Squamish Forest District are established as set out in Schedule A and managed as provided in Schedule B.

October 4, 2022

Date



**Minister of Land, Water and Resource
Stewardship
(or authorized signatory)**

David Muter

Printed Name and Title (if authorized
signatory)

(This part is for administrative purposes only and is not part of the Order.)

Authority under which Order is made:

Regulation and section: Government Actions Regulation (B.C. Reg. 582/2004) ss. 9(2) and 10(1)

PROVINCE OF BRITISH COLUMBIA

Schedule A

[Maps Provided]

Schedule B

Part 1: Definitions

1. Unless otherwise specified, words and expressions not defined in this order have the meaning given to them under the Forest and Range Practices Act (FRPA) and the regulations made under it.
2. In this order and the schedules to this order:

pesticide means a micro-organism or material that is represented, sold, used or intended to be used to prevent, destroy, repel or mitigate a pest, and includes

- a. a plant growth regulator, plant defoliator or plant desiccant,
- b. a pest control product as defined in the *Pest Control Products Act (PCAP)* (Canada), and
- c. a substance that is classified as a pesticide by regulation under the PCAP,

Part 2: Establishment of wildlife habitat areas

1. Wildlife habitat areas (WHAs) are modified and established as follows:
 - a) The areas shown in the maps set out in the attached Schedule A (WHAs x-xxx) and contained in the WHA spatial layer stored in the BC Geographic Warehouse (WHSE_WILDLIFE_MANAGEMENT.WCP_WILDLIFE_HABITAT_AREA_POLY) are WHAs 2-696, 2-697, 2-672, 2-679, 2-681, 2-682, 2-683, 2-688, 2-689, 2-690, 2-691 and 2-698 for Northern Goshawk. The centre points of the lines on the attached Schedule A are what establish the WHA boundaries;
 - b) If there is a discrepancy between the areas shown on the map attached as Schedule A and the WHA spatial layer stored in the British Columbia Geographic Warehouse (WHSE_WILDLIFE_MANAGEMENT.WCP_WILDLIFE_HABITAT_AREA_POLY), the areas as detailed in the WHA spatial layer will take precedent.

Part 3: General Wildlife Measures (GWMs)

The following measures are established for WHAs 2-696, 2-697, 2-672, 2-679, 2-681, 2-682, 2-683, 2-688, 2-689, 2-690, 2-691 and 2-698.

PROVINCE OF BRITISH COLUMBIA

Access

- a) Do not construct roads, trails, landings or stream crossings in the WHA.

Harvesting

- b) Do not conduct timber harvesting or salvage harvesting in the WHA.
- c) Felling of single trees for the purposes of removing danger trees, installing guy-line anchors, or tail-holds trees is permitted when required to address worker safety.
- d) Trees felled within a WHA must be retained on-site to provide coarse woody debris, unless the felled tree lies outside of the WHA. The portion that falls on the road, landing or outside the WHA boundary can be harvested.

Silviculture

- e) No silvicultural treatments except those required in legacy blocks to establish a free growing stand as per Section 29(2) of the Forest and Range Practices Act.

Pesticides

- f) Pesticide must only be applied to plant species prescribed as invasive plants under the Invasive Plants Regulation (FRPA)
- g) Pesticide application must be by selective application in a manner that does not result in drift to non-target species.

PROVINCE OF BRITISH COLUMBIA

Appendix A:

The following information is provided as background information and support to the Order establishing WHAs 2-696, 2-697, 2-672, 2-679, 2-681, 2-682, 2-683, 2-688, 2-689, 2-690, 2-691 and 2-698. This appendix is not part of the order.

These recommendations are intended to provide guidance to minimize direct disturbance to goshawks by outlining recommended distances and timing windows for a variety of activities that have the potential to disturb the birds.

Minimizing Direct Disturbance

As goshawks may nest in different locations each year within their breeding areas, attempts should be made by a qualified professional to locate the active nest and implement measures to minimize impacts during the goshawk breeding season. Goshawks, their eggs and their nests, when occupied by a bird or its egg, are protected under Section 34 of the *Wildlife Act*.

As the location of an active nest may not be known, these guidelines apply during the breeding season to all known nests within a goshawk territory, unless a nest check and appropriate goshawk survey(s) by a qualified professional are done during the breeding season and the nest is determined to be unoccupied or no longer exists.

Timing Restrictions

Minimize the risk of nest failure or abandonment from direct disturbance by following the timing restrictions and setback distances in Section 8.4 of in *Science-Based Guidelines for Managing Northern Goshawk Breeding Areas in Coastal British Columbia* (McClaren et al. 2015).¹

Table 1. Recommended minimum distance to keep activities away from the nearest active coastal goshawk nest site during periods of high and moderate risk (February 15 to September 15) (from McClaren et al. 2015)

Likelihood of Impact	Activity	Timing Restriction Distance¹
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High	<ul style="list-style-type: none">• Road-building (without blasting)• Logging• Pipeline and well-site construction Detonation of seismic charges• Wind tower construction• Seismic line cutting (mechanical)	More than 500 m
Moderate	<ul style="list-style-type: none">• Hauling and road maintenance (logs, heavy equipment, etc.)	More than 100 m

¹ Available at: <http://jem-online.org/index.php/jem/article/viewFile/576/506>

PROVINCE OF BRITISH COLUMBIA












Likelihood of Impact	Activity	Timing Restriction Distance ¹
Low	<ul style="list-style-type: none">• Silviculture activities (e.g., planting and site preparation)• Seismic line cutting (manual)• Industrial and public traffic	More than 50 m, where practicable. Individual birds and young may be affected by these activities. If birds seem distressed (i.e., continuous calling, birds staying away from active nest, aggressive behaviours toward people/equipment, etc.), then the activity should cease until at least July 1.

¹ This is the distance from the known nest site within which timing restrictions should be applied. Any activities that are farther away than this distance do not need to apply timing restrictions. Individual goshawks will vary in their response to disturbance levels, depending on several factors that include habitat characteristics, breeding chronology, age, and individual variation.

WHA 2-696

Chilliwack Northern Goshawk Wildlife Habitat Areas

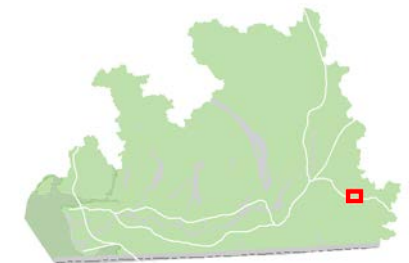
Legend

-  Proposed Northern Goshawk
 -  Wildlife Habitat Areas - Approved
 -  Ungulate Winter Range
 -  Old Growth Management Areas - Legal
 -  Non-Vegetated Land Cover
- Age Group**
-  Immature
 -  Mature
- Crown Forest Land Base**
-  Contributing
 -  Partial
 -  Non-Contributing
 -  Excluded

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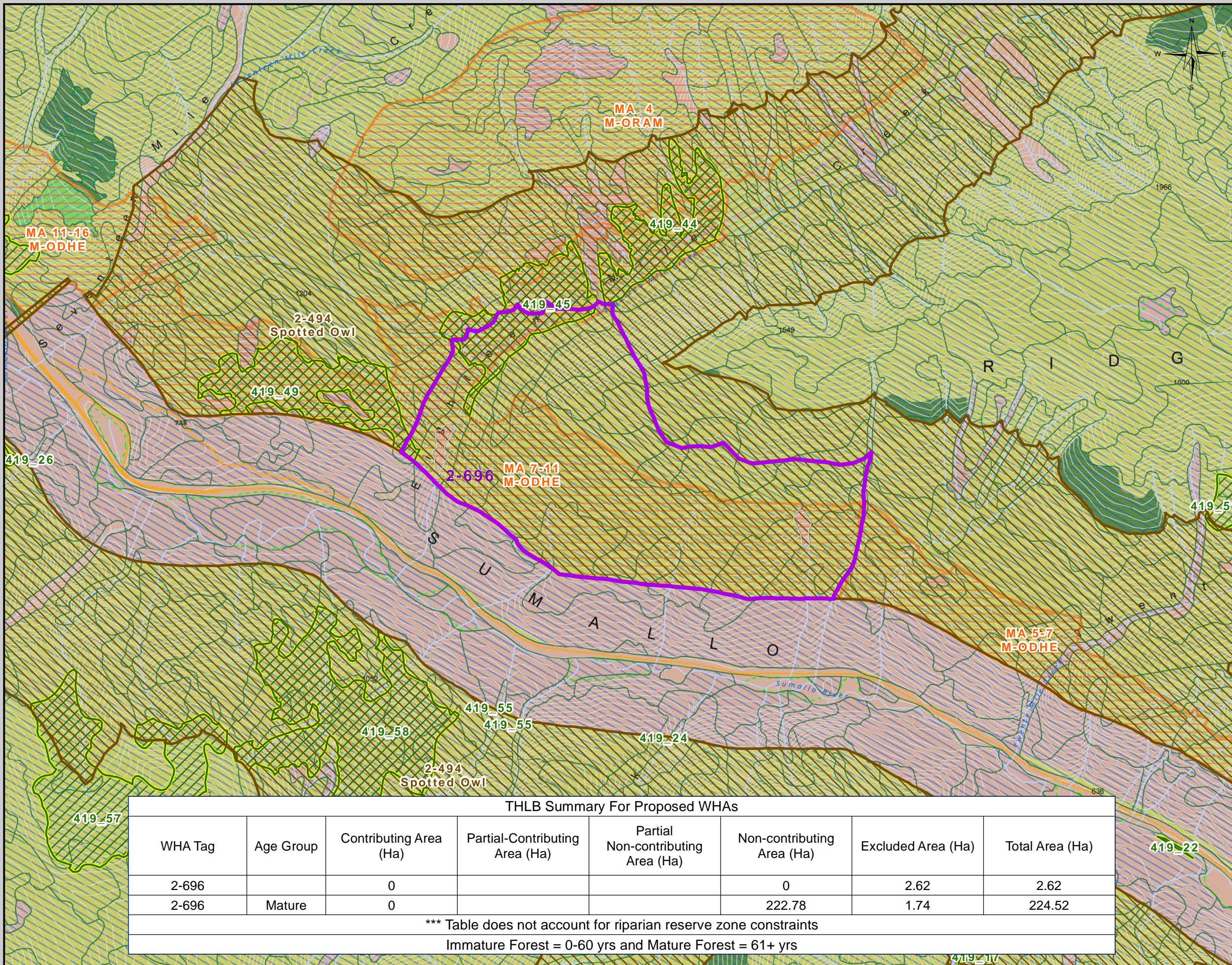
Inset Map - Chilliwack Natural Resource District:



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 Projection/Datum: Albers Equal Area/NAD 83
 Date Created: 2021/07/07
 Created for: South Coast Service Centre - JS



THLB Summary For Proposed WHAs

WHA Tag	Age Group	Contributing Area (Ha)	Partial-Contributing Area (Ha)	Partial Non-contributing Area (Ha)	Non-contributing Area (Ha)	Excluded Area (Ha)	Total Area (Ha)
2-696		0			0	2.62	2.62
2-696	Mature	0			222.78	1.74	224.52












*** Table does not account for riparian reserve zone constraints

Immature Forest = 0-60 yrs and Mature Forest = 61+ yrs

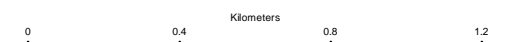
WHA 2-697

Chilliwack Northern Goshawk Wildlife Habitat Areas

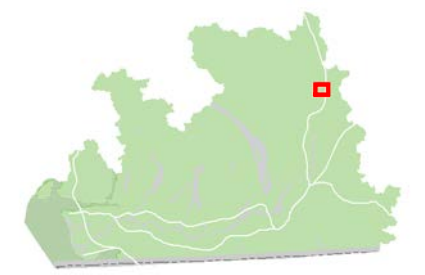
Legend

-  Proposed Northern Goshawk
 -  Wildlife Habitat Areas - Approved
 -  Ungulate Winter Range
 -  Old Growth Management Areas - Legal
 -  Non-Vegetated Land Cover
- Age Group**
-  Immature
 -  Mature
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-  Contributing
 -  Partial
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1:20,000



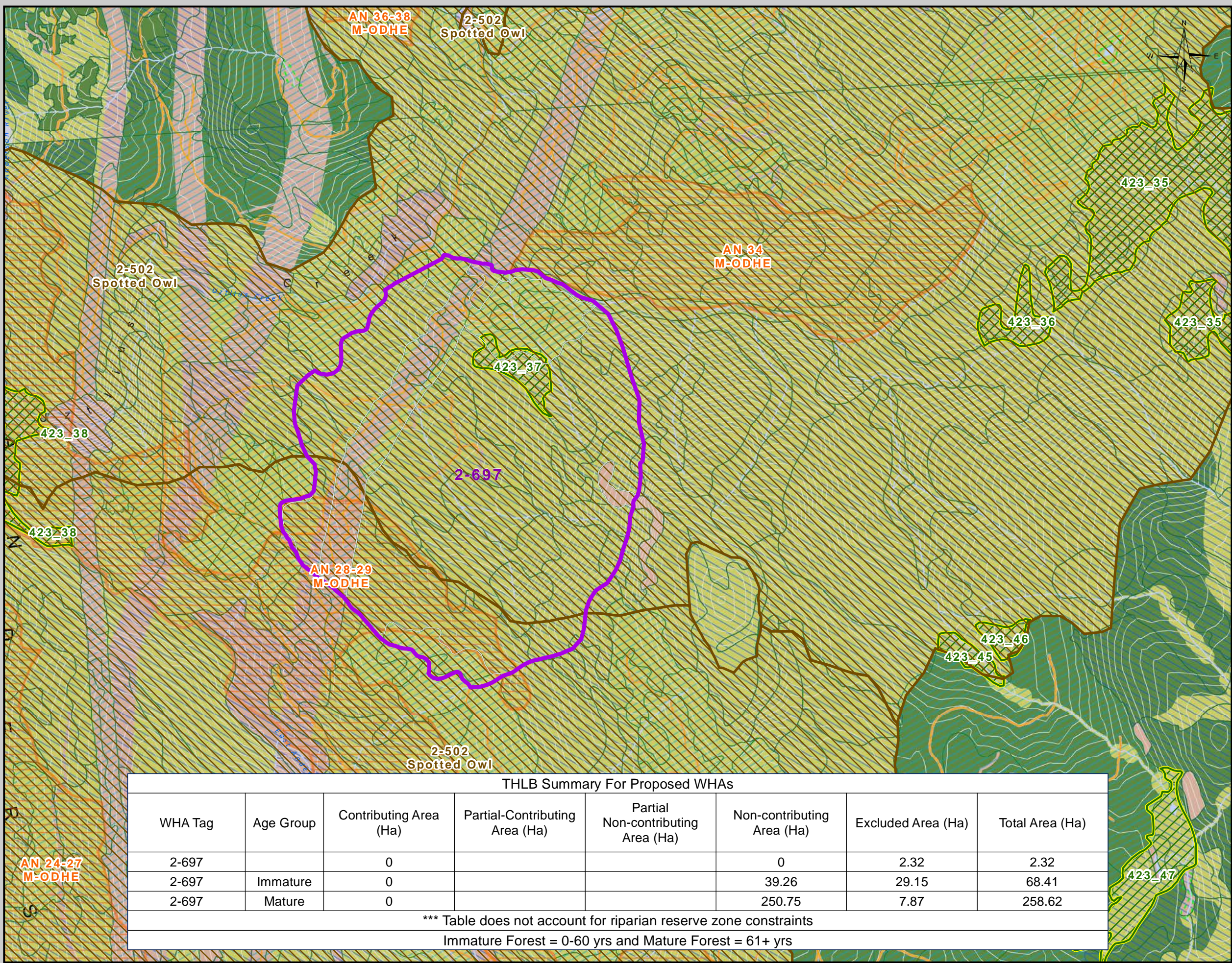
Inset Map - Chilliwack Natural Resource District:



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 Projection/Datum: Alberta Equal Area/NAD 83
 Date Created: 2021/07/07
 Created for: South Coast Service Centre - JS



THLB Summary For Proposed WHAs

WHA Tag	Age Group	Contributing Area (Ha)	Partial-Contributing Area (Ha)	Partial Non-contributing Area (Ha)	Non-contributing Area (Ha)	Excluded Area (Ha)	Total Area (Ha)
2-697		0			0	2.32	2.32
2-697	Immature	0			39.26	29.15	68.41
2-697	Mature	0			250.75	7.87	258.62

*** Table does not account for riparian reserve zone constraints
 Immature Forest = 0-60 yrs and Mature Forest = 61+ yrs



PROBYN LOG LTD.

Appendix 2h

Wildlife: Marbled Murrelet

Marbled Murrelet Order



Ministry of Forests, Lands, Natural Resource Operations and Rural Development

Ministerial Order

Order for the Recovery of Marbled Murrelet (*Brachyramphus marmoratus*)

Preamble

It is the goal of the Province, through land use objectives and other measures, to implement management of Marbled Murrelet (MAMU) nesting habitat on provincial Crown land to support viable populations of Marbled Murrelets across their range in B.C.

This Ministerial Order represents a statutory decision under the *Land Act* to implement a priority Action identified in the *Implementation Plan for the Recovery of Marbled Murrelet (Brachyramphus marmoratus) in British Columbia*. In addition, the Land Use Objectives Regulation requires an appropriate balance of social, economic and environmental benefits.

The purpose of this order, in relation to the maintenance of suitable marbled murrelet nesting habitat (hereafter suitable habitat) is to: 1) ensure the availability of suitable habitat meets or exceeds minimum habitat thresholds established for provincial Crown land for the West and North Vancouver Island and the Southern Mainland Coast Conservation Regions; and 2) retain 100% of the remaining suitable habitat on provincial Crown land in the East Vancouver Island Conservation Region. Provisions in the order are in place in the East Vancouver Island Conservation Region to avoid isolating and preventing access to natural resources and address safety concerns.

Minimum habitat thresholds are established for landscape unit portions and landscape unit aggregates. These thresholds influence how much suitable habitat will be maintained at those spatial scales and how suitable habitat is to be maintained and distributed across Crown land. The amount of suitable habitat must meet or exceed landscape unit portion and landscape unit aggregate minimum habitat thresholds. Landscape unit aggregates are located within the same Natural Resource District and Conservation Region; therefore, minimum habitat thresholds at the Natural Resource District and Conservation Region scales are achieved without the need to set objectives at those scales. To increase management flexibility in the West and North Vancouver Island and Southern Mainland Coast Conservation Regions suitable habitat targets are established for landscape unit portions which, combined, equal the minimum habitat threshold for the landscape unit aggregate they are located in. There is flexibility to deviate from the landscape unit portion suitable habitat targets as long as landscape unit portion and landscape unit aggregate minimum habitat thresholds are achieved.

This intent of this order is to meet the aspatial habitat management commitments outlined in the Implementation Plan. Separate and complementary measures outside the scope of this order will be implemented to meet spatial habitat management commitments through the establishment of Wildlife Habitat Areas under the *Forest and Range Practices Act* and Old Growth Management Areas under the *Land Act* so at least 80% of the minimum habitat thresholds for the West and North Vancouver Island and Southern Mainland Coast Conservation Regions are spatially mapped and protected.

Significant effort has been made to improve the accuracy of the suitable habitat mapping. It is anticipated that habitat mapping improvements will continue and support an update to this order five years in the future to be consistent with the best available information. The implementation of this Order will be monitored, and if results indicate objectives are not being met, this order may be reviewed and amended. This preamble is provided for context and background and does not form part of the order.

1. Relationship with *Forest and Range Practices Act* Objectives

- (1) Pursuant to section 93.4 of the *Land Act*, the objectives set out in paragraph 3 of this order are established as land use objectives for the purposes of the *Forest and Range Practices Act* and apply to the Crown land in the landscape unit portions and landscape unit aggregates shown on Schedule 1 attached to this order.
- (2) Nothing in, under or arising out of this order abrogates or derogates from any aboriginal rights, aboriginal title or treaty rights of any applicable First Nations and does not relieve the Province of any obligation to consult with any applicable First Nation.

2. Definitions

- (1) In this order:
 - a. The objectives set out in paragraph 3 of this order apply to the mapped polygons of marbled murrelet nesting habitat (Suitable Habitat) shown on Schedules 2 to 6 attached to this order.
 - b. Words and expressions not defined in this order have the meaning given to them in the *Forest and Range Practices Act*, the *Forest Act*, the *Range Act* and the regulations made under those Acts, unless the context indicates otherwise.
 - c. Where an objective refers to an area shown on a Schedule and the area is also defined by a spatial dataset, the boundaries of the area as defined by the spatial dataset apply in the event of any inconsistency. A complete list of spatial datasets is contained in:
www.for.gov.bc.ca - /ftp/RCO/external/!publish/MAMU/

3. Objectives for Marbled Murrelet nesting habitat

- (1) Maintain Suitable Habitat as follows:
 - (a) For each:
landscape unit aggregate in the order area:
Retain all timber in an amount equal to or greater than the minimum habitat threshold listed in Column “A” in Table 1 in Schedule “7”.
 - (b) For each:
landscape unit portion in the order area:
Retain all timber in an amount equal to or greater than the suitable habitat target listed in Column “A” in Table 2 in Schedule “7”;
- (2) Despite subsection (1)(b), the amount of timber that must be retained within a landscape unit portion in the West and North Vancouver Island and Southern Mainland Coast Conservation Regions may be less than the suitable habitat target listed in Column “A” in Table 2 in Schedule “7”, provided that:
The amount of timber retained is equal to or greater than the minimum habitat threshold listed in Column “B” in Table 2 in Schedule “7”.
- (3) Despite subsection (1)(a), Suitable Habitat polygons shown in Schedule “1 to 6” in the East Vancouver Island Conservation Region may be harvested, provided that harvesting is required for road access, other infrastructure, or to address safety concerns, where there is no practicable alternative.

(4) Variance from the Objectives in Sections 3.(1) to 3.(3) for the Suitable Habitat polygons shown in Schedule “1 to 6” may be allowed, provided that:

(a) A Qualified Professional:

- (i) Completes a field assessment that identifies the characteristics of Suitable Habitat using established standards; and
- (ii) Confirms the alteration will result in no net loss or functional loss of Suitable Habitat.

(b) A Regional Ministry of Forests, Lands, Natural Resource Operations and Rural Development biologist approves the alteration of the Suitable Habitat polygons.

- 4. This Order takes effect on the day that notice of this Order is published in the Gazette.
- 5. Pursuant to section 8(2)(b) of the *Forest and Range Practices Act*, an approved forest stewardship plan in the Order area must be amended to be consistent with this order within 6 months from the effective date of this Order.



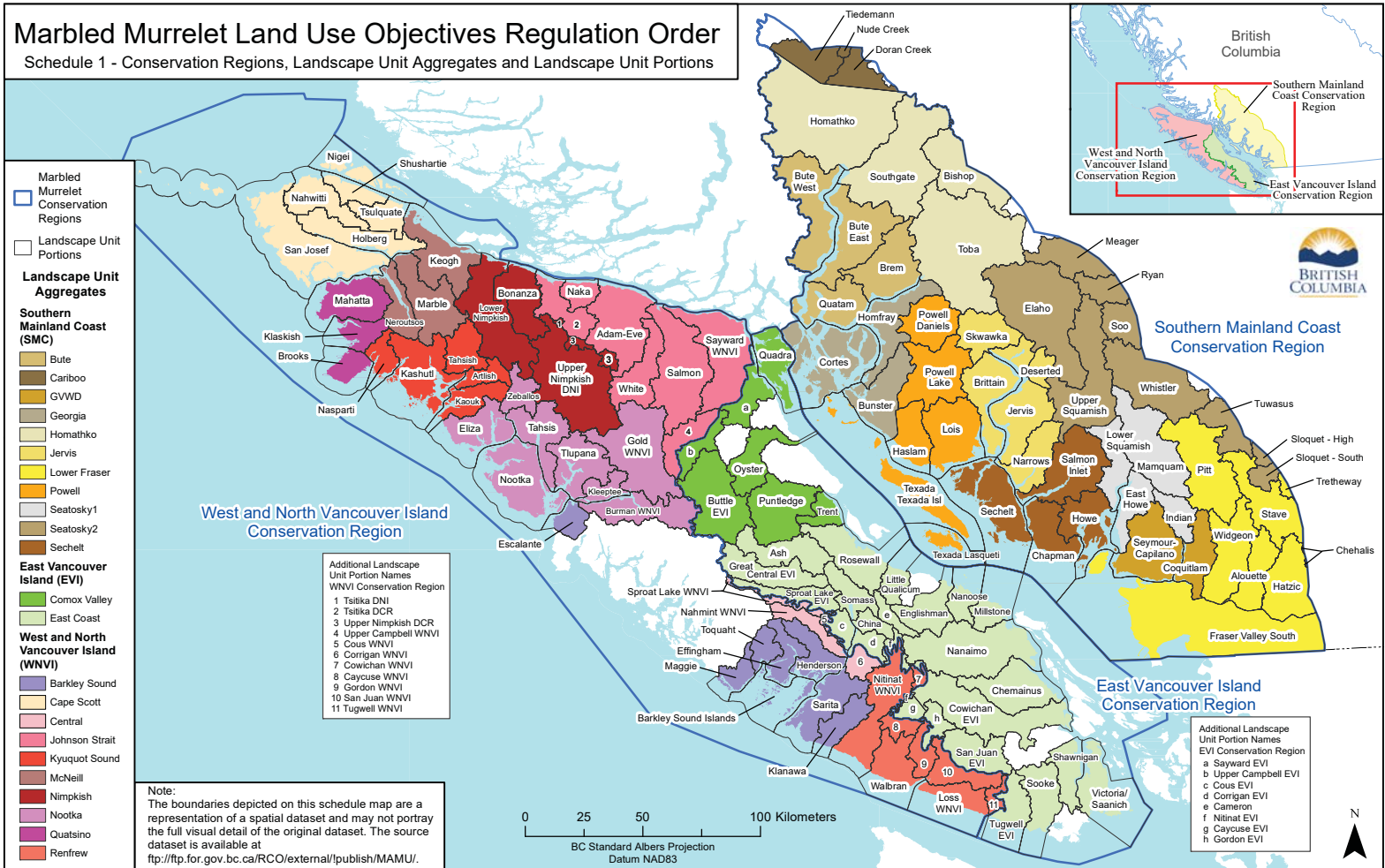
Craig Sutherland
Assistant Deputy Minister, Coast Region
Ministry of Forests, Lands, Natural
Resource Operations and Rural Development

November 19, 2021

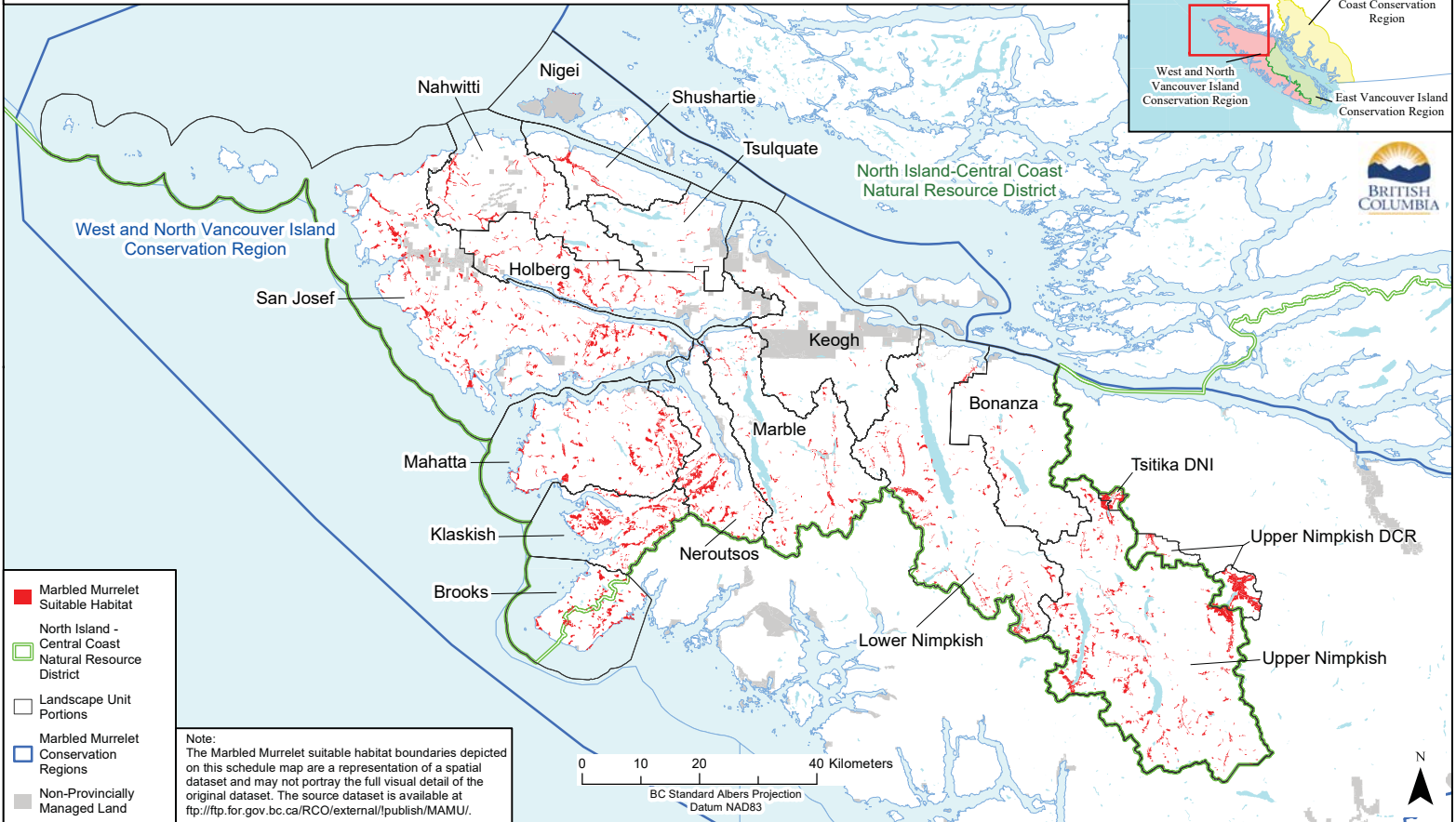
Date

Marbled Murrelet Land Use Objectives Regulation Order

Schedule 1 - Conservation Regions, Landscape Unit Aggregates and Landscape Unit Portions

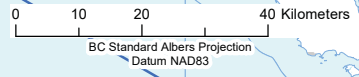


Marbled Murrelet Land Use Objectives Regulation Order
 Schedule 2 - Marbled Murrelet Nesting Habitat (Suitable Habitat) within Crown Land
 North Island - Central Coast Natural Resource District

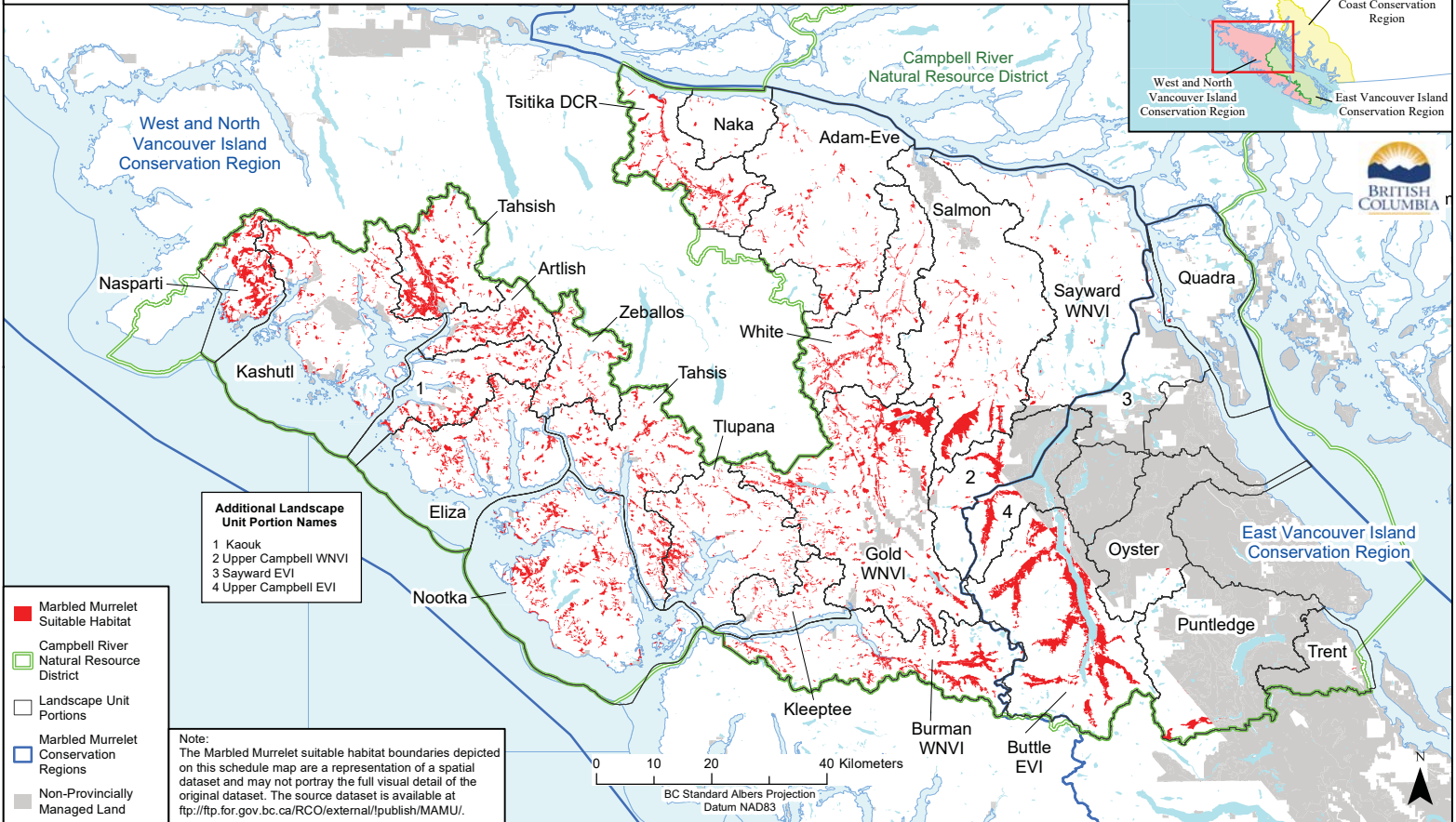


- Marbled Murrelet Suitable Habitat
- North Island - Central Coast Natural Resource District
- Landscape Unit Portions
- Marbled Murrelet Conservation Regions
- Non-Provincially Managed Land

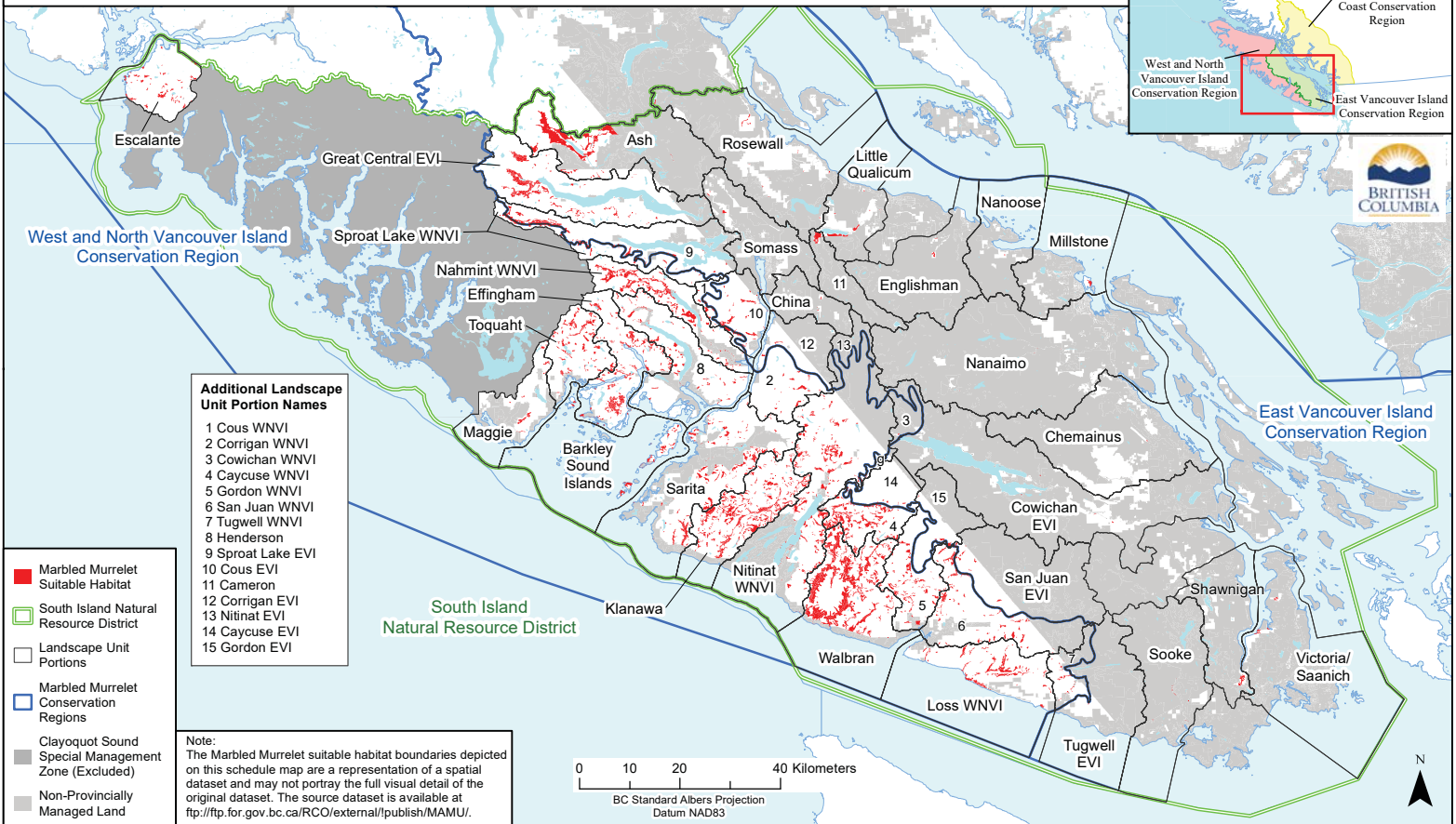
Note:
 The Marbled Murrelet suitable habitat boundaries depicted on this schedule map are a representation of a spatial dataset and may not portray the full visual detail of the original dataset. The source dataset is available at <ftp://ftp.for.gov.bc.ca/RCCO/external/publish/MAMU/>.



Marbled Murrelet Land Use Objectives Regulation Order
 Schedule 3 - Marbled Murrelet Nesting Habitat (Suitable Habitat) within Crown Land
 Campbell River Natural Resource District



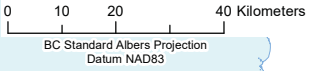
Marbled Murrelet Land Use Objectives Regulation Order
 Schedule 4 - Marbled Murrelet Nesting Habitat (Suitable Habitat) within Crown Land
 South Island Natural Resource District



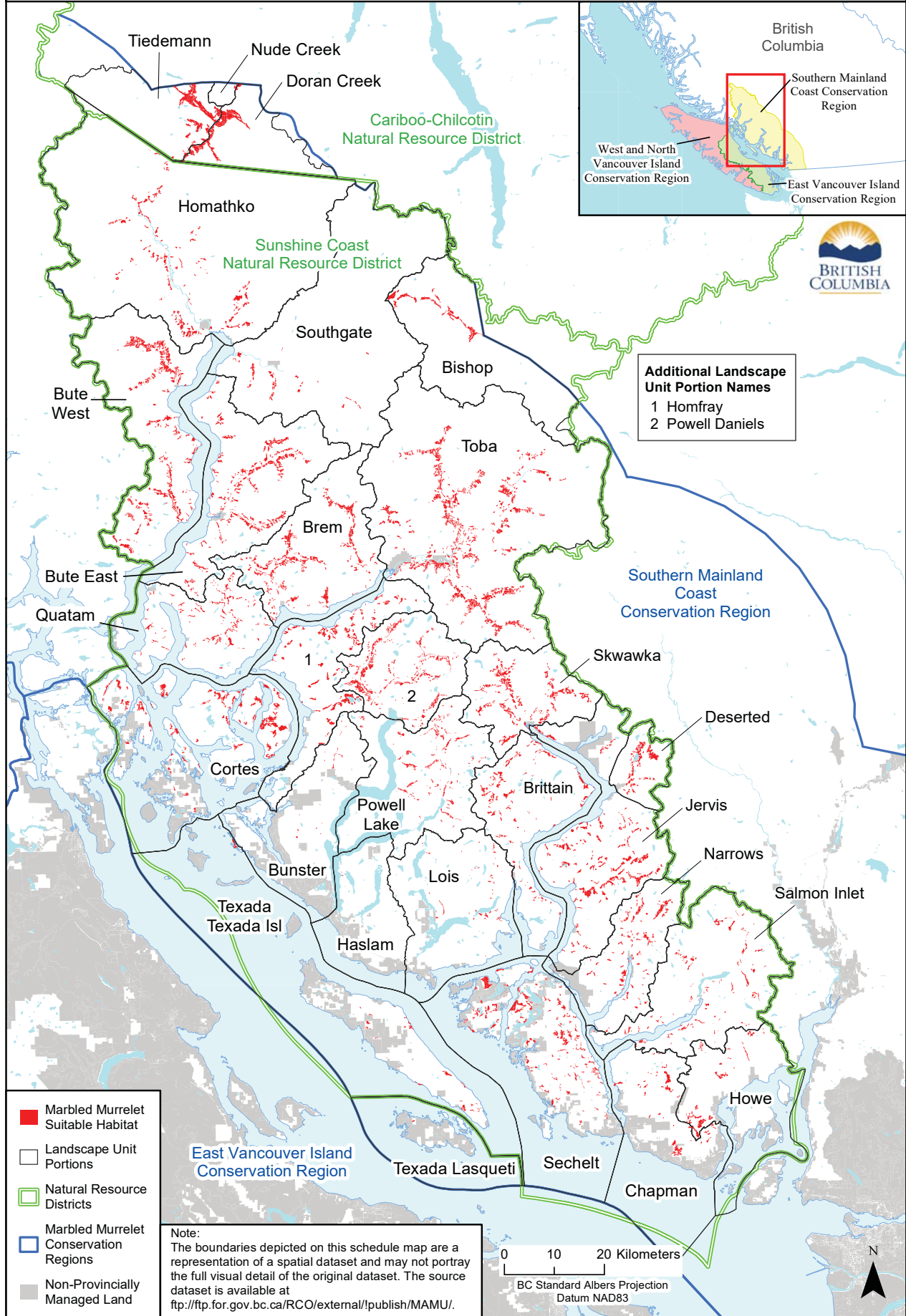
- Additional Landscape Unit Portion Names**
- 1 Cous WNV
 - 2 Corrigan WNV
 - 3 Cowichan WNV
 - 4 Caycuse WNV
 - 5 Gordon WNV
 - 6 San Juan WNV
 - 7 Tugwell WNV
 - 8 Henderson
 - 9 Sproat Lake EVI
 - 10 Cous EVI
 - 11 Cameron
 - 12 Corrigan EVI
 - 13 Nitinat EVI
 - 14 Caycuse EVI
 - 15 Gordon EVI

- Marbled Murrelet Suitable Habitat
- South Island Natural Resource District
- Landscape Unit Portions
- Marbled Murrelet Conservation Regions
- Clayoquot Sound Special Management Zone (Excluded)
- Non-Provincially Managed Land

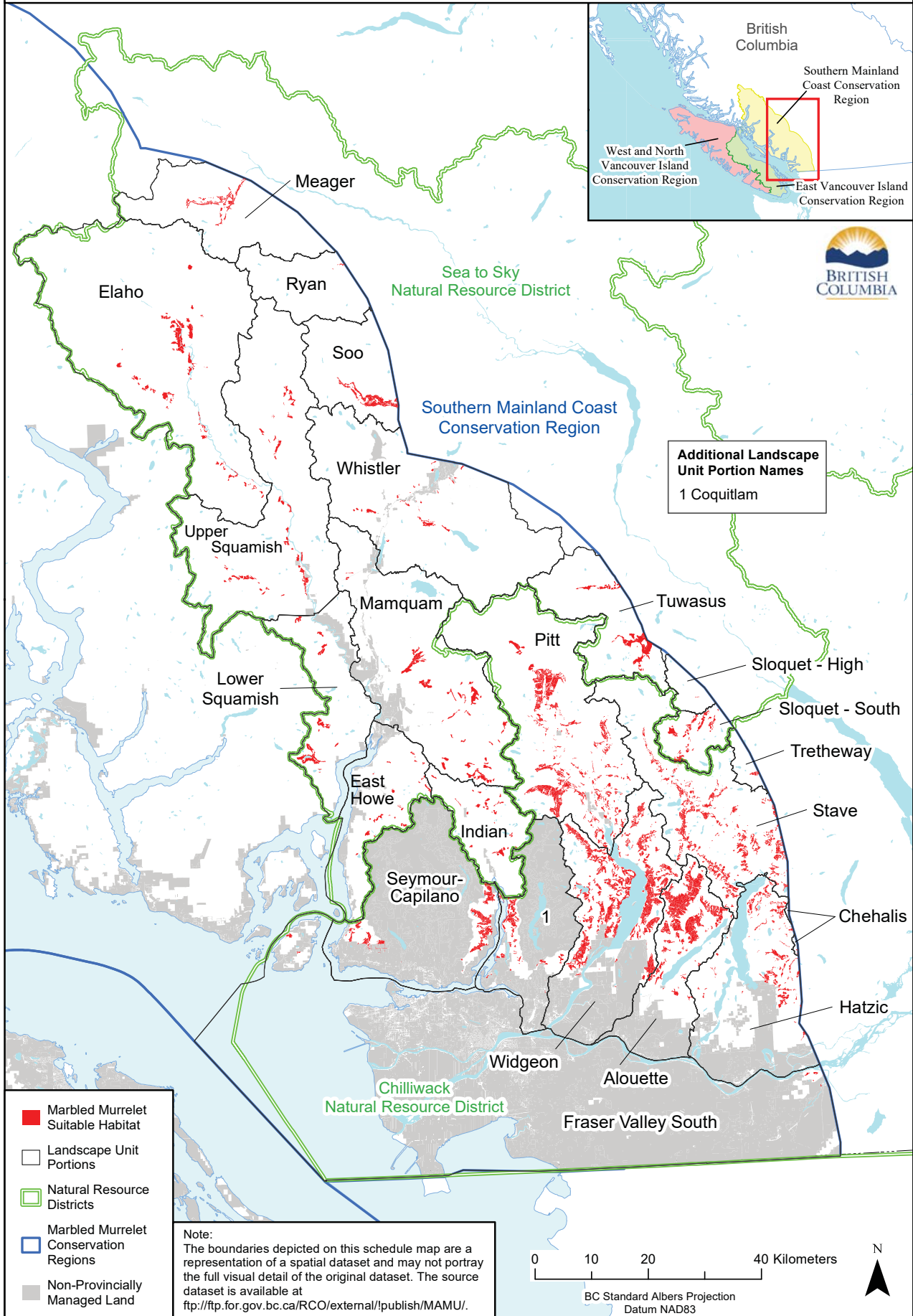
Note:
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**Marbled Murrelet Land Use Objectives Regulation Order
 Schedule 5 - Marbled Murrelet Nesting Habitat (Suitable Habitat) within Crown Land
 Cariboo-Chilcotin Natural Resource District and
 Sunshine Coast Natural Resource District**



Marbled Murrelet Land Use Objectives Regulation Order
 Schedule 6 - Marbled Murrelet Nesting Habitat (Suitable Habitat) within Crown Land
 Sea to Sky Natural Resource District and
 Chilliwack Natural Resource District



Objectives for Marbled Murrelet Nesting Habitat (Suitable Habitat)

TABLE 1

Landscape Unit Aggregate	Column "A" Suitable Habitat Target (Hectares Suitable Habitat)
Barkley Sound	6,762
Bute	9,353
Cape Scott	5,971
Cariboo	3,565
Central	2,238
Comox Valley	12,355
East Coast	6,916
Georgia	4,385
GVWD	2,427
Homathko	9,155
Jervis	8,128
Johnson Strait	12,591
Kyuquot Sound	14,360
Lower Fraser	22,038
McNeill	2,319
Nimpkish	6,929
Nootka	22,292
Powell	3,415
Quatsino	4,830
Renfrew	11,032
Seatosky1	2,943
Seatosky2	6,112
Sechelt	4,183
Total	184,299

TABLE 2

Landscape Unit Portion	Landscape Unit Aggregate	Column "A" Suitable Habitat Target (Hectares Suitable Habitat)	Column "B" Minimum Habitat Threshold (Hectares Suitable Habitat)
Barkley Sound Islands	Barkley Sound	241	193
Effingham	Barkley Sound	1,075	860
Escalante	Barkley Sound	355	284
Henderson	Barkley Sound	476	381
Klanawa	Barkley Sound	2,714	2,171
Maggie	Barkley Sound	178	142
Sarita	Barkley Sound	898	718
Toquaht	Barkley Sound	825	660
Brem	Bute	2,034	1,627
Bute East	Bute	2,810	2,248
Bute West	Bute	3,423	2,738
Quatam	Bute	1,086	869
Holberg	Cape Scott	1,106	885
Nahwitti	Cape Scott	1,073	858
Nigei	Cape Scott	10	8
San Josef	Cape Scott	3,223	2,578
Shushartie	Cape Scott	434	347
Tsulquate	Cape Scott	125	100
Doran Creek	Cariboo	1,615	1,292
Nude Creek	Cariboo	41	33
Tiedemann	Cariboo	1,909	1,527
Corrigan WNV	Central	223	178
Cous WNV	Central	202	162
Nahmint WNV	Central	1,520	1,216
Sproat Lake WNV	Central	293	234
Buttle EVI	Comox Valley	10,382	10,382
Oyster	Comox Valley	24	24
Puntledge	Comox Valley	575	575
Quadra	Comox Valley	30	30
Sayward EVI	Comox Valley	31	31
Trent	Comox Valley	10	10
Upper Campbell EVI	Comox Valley	1,303	1,303
Ash	East Coast	2,601	2,601
Cameron	East Coast	196	196
Caycuse EVI	East Coast	64	64
Chemainus	East Coast	4	4
China	East Coast	10	10

Schedule 7

Marbled Murrelet Order

Landscape Unit Portion	Landscape Unit Aggregate	Column “A” Suitable Habitat Target (Hectares Suitable Habitat)	Column “B” Minimum Habitat Threshold (Hectares Suitable Habitat)
Corrigan EVI	East Coast	45	45
Cous EVI	East Coast	433	433
Cowichan EVI	East Coast	11	11
Englishman	East Coast	35	35
Gordon EVI	East Coast	88	88
Great Central EVI	East Coast	1,831	1,831
Little Qualicum	East Coast	195	195
Millstone	East Coast	50	50
Nanaimo	East Coast	3	3
Nanoose	East Coast	4	4
Nitinat EVI	East Coast	30	30
Rosewall	East Coast	84	84
San Juan EVI	East Coast	127	127
Shawnigan	East Coast	101	101
Somass	East Coast	42	42
Sooke	East Coast	4	4
Sproat Lake EVI	East Coast	883	883
Tugwell EVI	East Coast	5	5
Victoria/Saanich	East Coast	70	70
Bunster	Georgia	86	69
Cortes	Georgia	2,526	2,021
Homfray	Georgia	1,773	1,418
Coquitlam	GVWD	816	653
Seymour-Capilano	GVWD	1,611	1,289
Bishop	Homathko	1,034	827
Homathko	Homathko	1,961	1,569
Southgate	Homathko	463	370
Toba	Homathko	5,697	4,558
Brittain	Jervis	1,306	1,045
Deserted	Jervis	855	684
Jervis	Jervis	2,661	2,129
Narrows	Jervis	1,158	926
Skwawka	Jervis	2,148	1,718
Adam-Eve	Johnson Strait	1,848	1,478
Naka	Johnson Strait	100	80
Salmon	Johnson Strait	4,051	3,241
Sayward WNV	Johnson Strait	481	385
Tsitika DCR	Johnson Strait	2,214	1,771

Schedule 7

Marbled Murrelet Order

Landscape Unit Portion	Landscape Unit Aggregate	Column "A" Suitable Habitat Target (Hectares Suitable Habitat)	Column "B" Minimum Habitat Threshold (Hectares Suitable Habitat)
Upper Campbell WNVl	Johnson Strait	1,272	1,018
White	Johnson Strait	2,625	2,100
Artlish	Kyuquot Sound	1,649	1,319
Kaouk	Kyuquot Sound	2,171	1,737
Kashutl	Kyuquot Sound	2,328	1,862
Nasparti	Kyuquot Sound	3,956	3,165
Tahsish	Kyuquot Sound	4,256	3,405
Alouette	Lower Fraser	4,769	3,815
Chehalis	Lower Fraser	9	7
Fraser Valley South	Lower Fraser	102	82
Hatzic	Lower Fraser	1,411	1,129
Pitt	Lower Fraser	4,556	3,645
Stave	Lower Fraser	3,673	2,938
Tretheway	Lower Fraser	39	31
Widgeon	Lower Fraser	7,479	5,983
Keogh	McNeill	169	135
Marble	McNeill	1,072	858
Neroutsos	McNeill	1,078	862
Bonanza	Nimpkish	199	159
Lower Nimpkish	Nimpkish	1,305	1,044
Tsitika DNI	Nimpkish	295	236
Upper Nimpkish DCR	Nimpkish	1,579	1,263
Upper Nimpkish DNI	Nimpkish	3,551	2,841
Burman WNVl	Nootka	3,980	3,184
Eliza	Nootka	2,087	1,670
Gold WNVl	Nootka	7,185	5,748
Kleeptee	Nootka	457	366
Nootka	Nootka	3,887	3,110
Tahsis	Nootka	2,446	1,957
Tlupana	Nootka	1,423	1,138
Zeballos	Nootka	827	662
Haslam	Powell	9	7
Lois	Powell	258	206
Powell Daniels	Powell	1,856	1,485
Powell Lake	Powell	934	747
Texada Lasqueti	Powell	14	11
Texada Texada Isl	Powell	344	275
Brooks	Quatsino	1,247	998

Schedule 7

Marbled Murrelet Order

Landscape Unit Portion	Landscape Unit Aggregate	Column "A" Suitable Habitat Target (Hectares Suitable Habitat)	Column "B" Minimum Habitat Threshold (Hectares Suitable Habitat)
Klaskish	Quatsino	1,809	1,447
Mahatta	Quatsino	1,774	1,419
Caycuse WNVl	Renfrew	1,203	962
Cowichan WNVl	Renfrew	1	1
Gordon WNVl	Renfrew	726	581
Loss WNVl	Renfrew	728	582
Nitinat WNVl	Renfrew	1,545	1,236
San Juan WNVl	Renfrew	762	610
Tugwell WNVl	Renfrew	59	47
Walbran	Renfrew	6,008	4,806
East Howe	Seatosky1	314	251
Indian	Seatosky1	356	285
Lower Squamish	Seatosky1	689	551
Mamquam	Seatosky1	1,584	1,267
Elaho	Seatosky2	1,643	1,314
Meager	Seatosky2	583	466
Ryan	Seatosky2	18	14
Sloquet - High	Seatosky2	3	2
Sloquet - South	Seatosky2	635	508
Soo	Seatosky2	791	633
Tuwasus	Seatosky2	1,193	954
Upper Squamish	Seatosky2	865	692
Whistler	Seatosky2	381	305
Chapman	Sechelt	566	453
Howe	Sechelt	641	513
Salmon Inlet	Sechelt	997	798
Sechelt	Sechelt	1,979	1,583

Total **184,299**

**NOTICE – INDICATORS OF THE AMOUNT, DISTRIBUTION AND ATTRIBUTES OF WILDLIFE HABITAT
REQUIRED FOR THE SURVIVAL OF Marbled Murrelet (*Brachyramphus marmoratus*)**

This notice is given under the authority of section 7(2) of the *Forest Planning and Practices Regulation* (B.C. Reg. 14/04) and section 9(3) of the *Woodlot Licence Planning and Practices Regulation* (B.C. Reg. 21/04).

This notice rescinds the following paragraphs for Marbled Murrelet (*Brachyramphus marmoratus*) in Schedule 1 of the following section 7(2) and section 9(3) notices:

- Paragraph 2, December 30, 2004 notice for the South Island Forest District
- Paragraph 2, July 27, 2004 notice for the Campbell River Forest District
- Paragraph 3, March 2, 2006 notice for the North Island Central Coast Forest District
- Paragraph 1, March 2, 2006 notice for the Sunshine Coast Forest District
- Paragraph 1, December 30, 2004 notice for the Squamish Forest District

The notice includes indicators of the amount, distribution and attributes of wildlife habitat required for the survival of the species at risk outlined in Schedule 1.

Suitable habitat within approved Wildlife Habitat Areas is included in the indicators of the amount, distribution and attributes for each of the species outlined in Schedule 1. As per section 7(3) of the *Forest Planning and Practices Regulation*, forest tenure holders are exempt from the obligation to specify a result or strategy in relation to the objective set out in section 7(1) of the *Forest Planning and Practices Regulation*, for approved Wildlife Habitat Areas.

This notice applies to the South Island Forest District, Campbell River Forest District, North Island Central Coast Forest District, Chilliwack Forest District, Squamish Forest District, Sunshine Coast Forest District and Chilcotin Forest District.

Pursuant to section 7(4) of the *Forest Planning and Practices Regulation* (B.C. Reg. 14/04) and 9(4) of the *Woodlot Planning and Practices Regulation* (B.C. Reg. 21/04) of the *Forest and Range Practices Act*, an approved forest stewardship plan or woodlot licence plan must be amended to be consistent with this notice within 6 months from the effective date of this notice.

SCHEDULE 1

1) Marbled Murrelet (*Brachyramphus marmoratus*)

Amount:

1. Table 1 provides the minimum amount of Marbled Murrelet nesting habitat (Suitable Habitat) to be maintained within both Marbled Murrelet Wildlife Habitat Areas (WHAs) and Old Growth Management Areas (OGMAs) combined and the minimum amount of Suitable Habitat to be maintained within Marbled Murrelet WHAs within Forest Districts.

Distribution:

1. Table 2 provides the minimum amount of Suitable Habitat to be maintained within both Marbled Murrelet WHAs and OGMAs combined and the minimum amount of Suitable Habitat to be maintained within Marbled Murrelet WHAs within landscape unit aggregates.

2. Table 3 provides the target and minimum amount of Suitable Habitat to be maintained within both Marbled Murrelet WHAs and OGMAs combined and the minimum amount of Suitable Habitat to be maintained within Marbled Murrelet WHAs within landscape unit portions.

Attributes: Species: Marbled Murrelet

Attribute	Characteristics
Size	Maintain a balanced range of patch sizes including a mix of large (>200 ha), medium (50-200 ha) and small (<50 ha) patches. Minimum patch sizes for Marbled Murrelet WHAs depend on what is available but are generally >20 ha.
Suitable Habitat	Suitable Habitat is Low Level Aerial Survey (LLAS) class 1-3 habitat and, where LLAS are not available, the BC Model.
Nesting Habitat Features	Old seral stage coniferous forests providing large trees with mossy platforms (limbs or deformities >15 cm diameter) with variable canopy structure and small canopy gaps.
Tree Size	Most nesting trees are typically >40 m tall. Nest heights are typically >30 m.
Structural Stage	7: Old Forest ¹ (>250 years - age class 9, but age class 8 is acceptable if stands provide nesting habitat features).

¹ <http://www.env.gov.bc.ca/wld/documents/identified/App05-Interim.pdf>

Sharon Hadway

Signed this

24 day of November, 2021

Sharon Hadway,
Regional Executive Director
West Coast Region

Ministry of Forests, Lands, Natural Resource Operations and Rural Development

Allan Johnsrude

Signed this

22 day of November, 2021

Allan Johnsrude,
Regional Executive Director
South Coast Region

Josh Pressey

Signed this

22 day of November 2021

Josh Pressey,
Regional Executive Director
Cariboo Region

TABLE 1

Forest District	Natural Resource District	MAMU WHA and OGMA Suitable Habitat Minimum (Ha)	MAMU WHA Suitable Habitat Minimum (Ha)
Cariboo	Cariboo-Chilcotin	423	299
Chilliwack	Chilliwack	3,383	1,381
Campbell River	Campbell River	17,391	10,561
North Island Central Coast	North Island Central Coast	8,811	5,191
Sunshine Coast	Sunshine Coast	19,715	10,112
South Island	South Island	9,709	5,936
Squamish	Sea to Sky	3,128	2,059
Total		62,560	35,539

abbreviations key: MAMU=Marbled Murrelet, WHA=Wildlife Habitat Area, OGMA=Old Growth Management Area, Ha=hectares

TABLE 2

Landscape Unit Aggregate	MAMU WHA and OGMA Suitable Habitat Minimum (Ha)	MAMU WHA Suitable Habitat Minimum (Ha)
Cariboo-Chilcotin Natural Resource District		
Cariboo	423	299
Chilliwack Natural Resource District		
GVWD	44	33
Lower Fraser	3,339	1,348
Campbell River Natural Resource District		
Johnson Strait	4,585	1,637
Kyuquot Sound	3,385	2,595
Nootka	9,421	6,329
North Island Central Coast Natural Resource District		
Cape Scott	3,009	1,400
McNeill	1,533	864
Nimpkish	2,379	1,251
Quatsino	1,890	1,676

TABLE 2 *continued*

Landscape Unit Aggregate	MAMU WHA and OGMA Suitable Habitat Minimum (Ha)	MAMU WHA Suitable Habitat Minimum (Ha)
<i>Sunshine Coast Natural Resource District</i>		
<i>Bute</i>	5,215	3,363
<i>Georgia</i>	2,221	695
<i>Homathko</i>	3,408	1,911
<i>Jervis</i>	3,944	2,150
<i>Powell</i>	2,288	843
<i>Sechelt</i>	2,639	1,150
<i>South Island Natural Resource District</i>		
<i>Barkley Sound</i>	4,533	3,366
<i>Central</i>	1,296	1,041
<i>Renfrew</i>	3,880	1,529
<i>Sea to Sky Natural Resource District</i>		
<i>Seatosky1</i>	1,535	1,004
<i>Seatosky2</i>	1,593	1,055
Total	62,560	35,539

abbreviation key: MAMU=Marbled Murrelet, WHA=Wildlife Habitat Area, OGMA=Old Growth Management Area, Ha=hectares

TABLE 3

Landscape Unit Portion	Landscape Unit Aggregate	MAMU WHA and OGMA Suitable Habitat Target (Ha)	MAMU WHA and OGMA Suitable Habitat Minimum (Ha)	MAMU WHA Suitable Habitat Target (Ha)	MAMU WHA Suitable Habitat Minimum (Ha)
Cariboo-Chilcotin Natural Resource District					
Doran Creek	Cariboo	358	286	251	201
Tiedemann	Cariboo	65	52	48	38
Chilliwack Natural Resource District					
Coquitlam	GVWD	44	35	33	26
Alouette	Lower Fraser	87	70	10	8
Chehalis	Lower Fraser	7	5	0	0
Fraser Valley South	Lower Fraser	71	56	21	17
Hatzic	Lower Fraser	914	731	73	59
Pitt	Lower Fraser	1,053	842	634	508
Stave	Lower Fraser	983	787	461	369
Tretheway	Lower Fraser	37	30	25	20
Widgeon	Lower Fraser	187	149	124	99

TABLE 3 *continued*

Landscape Unit Portion	Landscape Unit Aggregate	MAMU WHA and OGMA Suitable Habitat Target (Ha)	MAMU WHA and OGMA Suitable Habitat Minimum (Ha)	MAMU WHA Suitable Habitat Target (Ha)	MAMU WHA Suitable Habitat Minimum (Ha)
Campbell River Natural Resource District					
Adam-Eve	Johnson Strait	844	675	0	0
Naka	Johnson Strait	50	40	0	0
Salmon	Johnson Strait	1,045	836	372	298
Sayward WNV	Johnson Strait	157	126	68	54
Tsitika DCR	Johnson Strait	489	391	197	157
White	Johnson Strait	2,000	1,600	1,000	800
Artlish	Kyuquot Sound	797	637	631	505
Kaouk	Kyuquot Sound	1,246	997	1,017	813
Kashutl	Kyuquot Sound	811	649	605	484
Tahsish	Kyuquot Sound	531	425	342	274
Burman WNV	Nootka	852	682	498	399
Eliza	Nootka	1,219	975	913	731
Gold WNV	Nootka	1,689	1,351	943	754
Kleeptee	Nootka	332	266	245	196
Nootka	Nootka	2,371	1,897	1,708	1,366
Tahsis	Nootka	1,543	1,234	996	797
Tlupana	Nootka	897	718	589	471
Zeballos	Nootka	518	414	437	350
North Island Central Coast Natural Resource District					
Holberg	Cape Scott	532	425	314	251
Nahwitti	Cape Scott	607	486	388	310
Nigei	Cape Scott	7	5	0	0
San Josef	Cape Scott	1,641	1,313	677	542
Shushartie	Cape Scott	98	78	21	17
Tsulquate	Cape Scott	124	99	0	0
Keogh	McNeill	71	57	39	31
Marble	McNeill	783	627	280	224
Neroutsos	McNeill	679	543	545	436
Bonanza	Nimpkish	120	96	120	96
Lower Nimpkish	Nimpkish	680	544	263	210
Tsitika DNI	Nimpkish	100	80	49	39
Upper Nimpkish DCR	Nimpkish	98	79	86	69
Upper Nimpkish DNI	Nimpkish	1,381	1,105	733	586
Klaskish	Quatsino	1,119	895	1,118	894
Mahatta	Quatsino	771	616	558	447

TABLE 3 *continued*

Landscape Unit Portion	Landscape Unit Aggregate	MAMU WHA and OGMA Suitable Habitat Target (Ha)	MAMU WHA and OGMA Suitable Habitat Minimum (Ha)	MAMU WHA Suitable Habitat Target (Ha)	MAMU WHA Suitable Habitat Minimum (Ha)
Sunshine Coast Natural Resource District					
Brem	Bute	1,412	1,130	1,177	942
Bute East	Bute	1,515	1,212	884	707
Bute West	Bute	1,753	1,402	1,082	866
Quatam	Bute	535	428	220	176
Bunster	Georgia	42	34	19	15
Cortes	Georgia	955	764	66	53
Homfray	Georgia	1,224	979	610	488
Bishop	Homathko	182	146	136	109
Homathko	Homathko	879	703	94	75
Southgate	Homathko	198	159	52	42
Toba	Homathko	2,149	1,719	1,629	1,303
Brittain	Jervis	775	620	620	496
Deserted	Jervis	431	344	431	344
Jervis	Jervis	1,562	1,249	516	412
Narrows	Jervis	621	497	518	414
Skwawka	Jervis	555	444	65	52
Haslam	Powell	1	1	0	0
Lois	Powell	175	140	0	0
Powell Daniels	Powell	1,304	1,043	397	318
Powell Lake	Powell	642	514	329	263
Texada Lasqueti	Powell	9	7	0	0
Texada Texada Isl	Powell	157	125	117	94
Chapman	Sechelt	344	275	139	111
Howe	Sechelt	451	361	449	359
Salmon Inlet	Sechelt	617	493	46	37
Sechelt	Sechelt	1,227	981	516	412

TABLE 3 *continued*

Landscape Unit Portion	Landscape Unit Aggregate	MAMU WHA and OGMA Suitable Habitat Target (Ha)	MAMU WHA and OGMA Suitable Habitat Minimum (Ha)	MAMU WHA Suitable Habitat Target (Ha)	MAMU WHA Suitable Habitat Minimum (Ha)
South Island Natural Resource District					
Barkley Sound Islands	Barkley Sound	183	146	101	81
Effingham	Barkley Sound	779	623	584	467
Escalante	Barkley Sound	249	199	184	147
Henderson	Barkley Sound	231	184	172	138
Klanawa	Barkley Sound	1,578	1,262	1,258	1,006
Maggie	Barkley Sound	103	82	56	45
Sarita	Barkley Sound	853	683	603	483
Toquaht	Barkley Sound	557	446	408	326
Corrigan WNV	Central	171	137	171	137
Cous WNV	Central	115	92	94	75
Nahmint WNV	Central	853	682	712	570
Sproat Lake WNV	Central	157	126	64	51
Caycuse WNV	Renfrew	876	701	119	95
Cowichan WNV	Renfrew	1	1	0	0
Gordon WNV	Renfrew	467	374	231	185
Loss WNV	Renfrew	451	361	371	297
Nitinat WNV	Renfrew	879	703	286	229
San Juan WNV	Renfrew	588	470	217	174
Tugwell WNV	Renfrew	31	25	17	14
Walbran	Renfrew	587	470	288	230
Sea to Sky Natural Resource District					
East Howe	Seatosky1	167	133	23	19
Indian	Seatosky1	143	114	31	25
Lower Squamish	Seatosky1	285	228	225	180
Mamquam	Seatosky1	940	752	725	580
Meager	Seatosky2	322	258	179	143
Ryan	Seatosky2	8	7	0	0
Sloquet - High	Seatosky2	3	2	0	0
Sloquet - South	Seatosky2	213	171	120	96
Soo	Seatosky2	254	203	170	136
Upper Squamish	Seatosky2	567	454	506	405
Whistler	Seatosky2	226	181	80	64
Totals		62,560		35,539	

abbreviation key: MAMU=Marbled Murrelet, WHA=Wildlife Habitat Area, OGMA=Old Growth Management Area, Ha=hectares



PROBYN LOG LTD.

Appendix 2i

Wildlife: Mountain Goat



ORDER – UNGULATE WINTER RANGE #U-2-001
Fraser TSA Mountain Goat

This order is given under the authority of sections 9(1), 9(2) and 12(1) of the *Government Actions Regulation* (B.C. Reg. 582/2004).

The Deputy Minister of Environment orders that:

1. the ungulate winter range shown on the map set out in the attached Schedule A (#U-2-001) is established;
2. the ungulate winter range in the attached Schedule A is established for mountain goat (*Oreamnos americanus*);
3. the general wildlife measures outlined in Schedule 1 are established for the ungulate winter ranges in the attached Schedule A;
4. general wildlife measure 5 outlined in Schedule 1 is established and applies to a 500m specified area surrounding each ungulate winter range;
5. where there is any discrepancy between the ungulate winter range boundaries as shown in the attached Schedule A and the GIS file *tuwra_bc*, the boundaries as detailed in the GIS file will take precedent. The centre point of the line on the map denoting the ungulate winter range is what establishes the boundary;
6. pursuant to section 7(3) of the *Forest Planning and Practices Regulation* a person required to prepare a forest stewardship plan is exempt from the obligation to prepare results or strategies in relation to the objective set out in section 7(1) of the *Forest Planning and Practices Regulation* for the winter survival of mountain goat in the Fraser TSA;
7. for the purposes of section 2 (3)(a) of the *Government Actions Regulation*, these General Wildlife Measures apply to minor tenures; and
8. the general wildlife measures outlined in Schedule 1 do not apply for the purposes of exploration, development and production activities when these activities have been authorized for the purpose of subsurface resource exploration, development or production by the *Mineral Tenure Act*, the *Coal Act*, the *Mines Act*, the *Petroleum and Natural Gas Act*, the *Pipeline Act* or the *Geothermal Resources Act*.

Schedule 1 – General Wildlife Measures

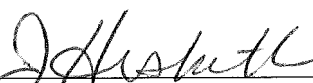
In this schedule:

“Primary forest activity” is defined as in the *Forest Planning and Practices Regulation*.

1. Primary forest activities, including salvage and harvest of botanical forest products, will result in the retention of all forest or vegetative cover within the mountain goat winter range.
2. For the purposes of general wildlife measure 1, exemptions would only normally be considered if they result in enhancing quality of the winter range habitat as determined by Ministry of Environment; or for road construction where there is no other practicable option. An exemption is not required for the following:
 - a) road maintenance or deactivation on existing roads within the ungulate winter range;
 - b) tailholds/guyline anchors in the ungulate winter range associated with landings/cutblocks adjacent to the ungulate winter range boundary;
 - c) to meet worker safety concerns on existing or authorized roads within the ungulate winter range, or worker safety concerns along cutblock boundaries adjacent to or authorized within the ungulate winter range (e.g. danger tree felling); or
 - d) the list of exempt Category A cut-blocks attached in Appendix 1

Any trees felled for general wildlife measure 2 a), b), or c) will be left on site to function as coarse woody debris, unless the tree falls onto the road or landing or outside the ungulate winter range boundary. The portion that lies on the road or landing or outside the ungulate winter range boundary can be harvested.

3. Primary forest activities will not result in the use of pesticides within the ungulate winter range, except for spot treatment within 1 metre around individual conifer crop trees on existing or exempt cutblocks that are not yet free to grow. The use of *Bacillus thuringiensis* for the control of western spruce budworm and beetle pheromones for the control of bark beetles are exempted.
4. Any primary forest activities (except ground based tree planting) occurring within ungulate winter range must be confined to a period extending from May 1 to October 31 of a calendar year to prevent disturbance to mountain goats, unless exempted.
5. Helicopter logging that occurs within 500 meters horizontal distance of a mountain goat winter range will not result in a material adverse disturbance to mountain goats. To achieve this, helicopter logging operations within 500 meters horizontal distance of an established mountain goat winter range will take place from May 1 to October 31 of a calendar year, unless exempted.


Signed this 10 day of March, 2008
Joan Hesketh, Deputy Minister
Ministry of Environment

Appendix 1:

The following information is intended to provide background information and support to the legal order establishing UWR #U-2-001. This appendix is not part of the legal order establishing UWR #U-2-001.

1. Authority to consider an exemption from these general wildlife measures is provided in Section 92(1) of the *Forest Planning and Practices Regulation*. In instances where it is not practicable to comply with these measures, a person proposing to conduct forestry activities should consider seeking an exemption from the requirements to comply with the applicable General Wildlife Measures.

An exemption application should be submitted to the Ministry of Environment's Regional Manager at the Lower Mainland Regional office – located at 10470 152 Street Surrey, BC V3R 0Y3 (a template for exemption requests is available from the Regional Manager Ministry of Environment). The exemption application must include a rationale describing the nature of the problem and options to integrate winter range conservation with proposed forest practices. This submission will assist in timely consideration of the matter, and will inform the conditions, if any, of the exemption that may be granted prior to commencement of activities. Upon receipt of a complete exemption application, a determination for timing window exemptions will be processed in 5 to 7 working days, all other exemptions will be handled within 20 working days of arrival at the MOE Regional office.

2. The following Category A approved cut-blocks are exempt from general wildlife measure 1 until they are declared free to grow. No further expansion or relocation of the existing block boundary into the goat winter range from that described below is permitted:
 - Seabird block BS6610 (1.7 ha overlap with BS8; heli-log only in GWR)
 - Seabird block BS6620 (5.0 ha overlap with BS8; heli-log only in GWR)
 - Seabird blocks SK5320 (2.3 ha overlap with SH9)
 - Cattermole block CO1020 (0.2 ha overlap with CQ12)
 - Teal Cedar block 358 (10.8ha overlap with PI1)
 - Tamihi block 8710 (2.6 ha overlap with SH2)
 - Chawathil block BS6626 (6.1 ha overlap with BS8; heli-log only in GWR)
 - BC Timber Sales block A54092-A (15.5 ha overlap with ST1)
 - BC Timber Sales A54092-F (5.0 ha overlap with ST1)
 - BC Timber Sales block WN125 (6.3 ha overlap with ST5)
 - Hope Comm. Forest block SK0020 (1.2 ha overlap with SH6; overlap into WTP reserve)
 - A&A Trading block SK5371 (12.4 ha overlap with SH9)
3. With respect to general wildlife measure 5, exemptions for operating within the restricted timing window may be granted on a biweekly, weekly, or daily basis, dependent on time of year, weather conditions and presence of goats. Further:
 - It should be recognized that this 500 m setback is a risk-tolerant approach based on socio-economic considerations in the Fraser TSA. Existing literature and professional opinion indicates that 1500 m is a more appropriate setback. Ministry of Environment

will monitor to determine impacts to goats; if impacts are substantial then the Delegated Decision Maker will revisit the 500 m setback.

- Exemption applications for activities involving significant or sustained disturbance such as helicopter yarding, road construction with heavy equipment, drilling or blasting will be carefully reviewed, and if approved, monitored more closely since these activities are most likely to result in material adverse disturbance to goats.
 - Each exemption request will be evaluated on its own merit according to the historical intensity of mountain goat use of an area, type of work proposed, current weather conditions and short and long term weather forecasts.
 - It is the proponent's responsibility to conduct a brief aerial survey using a qualified ungulate biologist to confirm that goats are not present. Ministry of Environment regional staff may be able to participate in surveys. The survey should be done near the beginning/end of the normal timing window, and if any sign of mountain goat activity (tracks or animals) is noted within 500 metres of the proposed operational area, proponent's should consider whether their planned activity will result in a material adverse disturbance to goats; and if so the exemption request should not be submitted. Please note that helicopter flights in themselves can cause material adverse disturbance to wintering goats. Repeated overflights of occupied goat winter range habitats are not to occur.
 - When an exemption has been granted, work may continue when minor snowfalls occur (i.e. less than 8 hours duration and less than 0.3 m depth). However, when snowfalls exceed this proponent's should anticipate that continued activity will result in material adverse disturbance to goats. For this reason, work areas are to be kept small so operations can be stopped on short notice.
4. Exemptions for general wildlife measure 4 and 5 will normally only be considered in early or late winter since longer extensions are most likely to result in material adverse disturbance to mountain goats.
 5. For purposes of general wildlife measure 2, "enhancement" means improvement of second growth young forest stands to increase future snow interception cover (e.g. thinning dense young forested stands).



ORDER – MINOR BOUNDARY AMENDMENT TO UNGULATE WINTER RANGE U-2-001
Mountain Goat Unit CQ5 – Chilliwack Natural Resource District

This Order is given under the authority of section 12(1) of the *Government Actions Regulation* (B.C. Reg. 582/2004)(GAR).

1. The delegated decision maker, being satisfied that
 - i. the area in amended Unit CQ5 contains habitat that is necessary to meet the winter habitat requirements for mountain goat (*Oreamnos americanus*); and
 - ii. the habitat requires special management that is not otherwise provided for under GAR or another enactment;

orders that:

- a) this Order cancels the establishment of Unit CQ5 in the Order that became effective April 17, 2008 entitled “Order – Ungulate Winter Range #U-2-001 Fraser TSA Mountain Goat”; and replaces it with the establishment of amended Unit CQ5 as shown on the attached Schedule A map, and contained in the UWR spatial layer stored in the Geographic Warehouse (WHSE_WILDLIFE_MANAGEMENT.WCP_UNGULATE_WINTER_RANGE_POLY). The centre point of the line on the attached Schedule A map is what establishes the UWR boundary;
- b) the remaining mountain goat Units and the remainder of the Order content, including the Order Appendix, as originally established by the Order for UWR U-2-001 that became effective on April 17, 2008 remain unchanged and in effect;
- c) if there is a discrepancy between the area shown in the map set out in the attached Schedule A map and the UWR spatial layer stored in the Geographic Warehouse (WHSE_WILDLIFE_MANAGEMENT.WCP_UNGULATE_WINTER_RANGE_POLY), the area as detailed in the UWR spatial layer will take precedent.

A handwritten signature in black ink, appearing to read "Scott Barrett".

Signed this 15th day of June, 2017

Scott Barrett, Director of Resource Management

South Coast Natural Resource Region

Ministry of Forests, Lands and Natural Resource Operations



PROBYN LOG LTD.

Appendix 2j

Wildlife: Black-tailed and Mule Deer

ORDER – UNGULATE WINTER RANGE U-2-006

This order is given under the authority of sections 9(2) and 12(1) of the *Government Actions Regulation* (B.C. Reg. 582/2004).

1. The Deputy Minister of Environment, being satisfied that
 - i. the following area contains habitat that is necessary to meet the winter habitat requirements for Mule Deer (*Odocoileus hemionus hemionus*) and Columbian Black-tailed Deer (*O. h. columbianus*); and
 - ii. the habitat requires special management that is not otherwise provided for under GAR or another enactment;

orders that

- a) the areas shown in the map set out in the attached Schedule A (U-2-006) and contained in the ungulate winter range (UWR) spatial layer stored in the Land and Resource Data Warehouse (*tuwra_bc*) are established as ungulate winter range U-2-006 for Mule Deer and Columbian Black-tailed Deer. The centre point of the line on the attached Schedule A is what establishes the UWR boundary; and
- b) if there is a discrepancy between the areas shown in the map set out in the attached Schedule A and the UWR spatial layer stored in the Land and Resource Data Warehouse (*tuwra_bc*), the areas as detailed in the UWR spatial layer will take precedent.

2. The Deputy Minister of Environment, being satisfied that
 - i. the general wildlife measures (GWMs) described below are necessary to protect and conserve Mule Deer and Columbian Black-tailed Deer; and
 - ii. GAR or another enactment does not otherwise provide for that protection or conservation;

orders that

- a) the GWMs outlined in Schedule 1 are established for UWR U-2-006.
3. Pursuant to section 7(3) of the *Forest Planning and Practices Regulation* a person required to prepare a forest stewardship plan is exempt from the obligation to prepare results or strategies in relation to the objective set out in section 7(1) of the *Forest Planning and Practices Regulation* for deer winter range in the Fraser TSA.
 4. The general wildlife measures outlined in schedule 1 do not apply for the purposes of exploration, development and production activities when these activities have been authorized for the purpose of subsurface resource exploration, development or production by the *Mineral Tenure Act*, the *Coal Act*, the *Mines Act*, the *Petroleum and Natural Gas Act*, the *Pipeline Act* or the *Geothermal Resources Act*.

Definitions:

For the purposes of this order:

capable winter range means areas within established ungulate winter ranges which are situated on warm aspects (135-285°), and moderate to steep slopes (40-100%, including associated benches) that are not exposed to topographic shading from adjacent hillsides. Includes areas that may be interspersed with small openings (<0.5 ha), and/or rock outcrops exposed to solar radiation to provide warmth and snow ablation. Gentle slopes in the shallow snow zone which are generally snow free are also capable habitat regardless of forest canopy attributes. (Schedule B map).

deep snow zone means areas of an ungulate winter range that are >800m elevation.

moderate snow zone means areas of an ungulate winter range that are between 400m elevation and 800m elevation.

mainline road means a principal timber extraction road.

non-retention ungulate winter range means an area within an ungulate winter range that is not being managed as suitable snow interception habitat, recruitment habitat, open suitable habitat or young suitable snow interception habitat to meet the requirements of general wildlife measures 1, 2 and 4.

open suitable habitat means capable winter range areas with the following forest attributes: mature (>100 years old) or old growth (>250 years old) Douglas-fir leading (>40% fir) forest that has been confirmed to have moderate to high deer use as winter habitat; with at least 90% of tree heights >19.5m (up to 10% can come from height class 2) or site index >12; crown closure class ≤5%; exhibit multiple canopy layers and large well developed crowns.

primary forest activities is as defined in the *Forest Planning and Practices Regulation*

recruitment habitat means, for the purposes of general wildlife measure 1, 2 and 4, capable winter range areas which:

- (a) will provide leading Douglas-fir (>40% fir) forest stands with Site Index >12
 - i) that will, when a deficit occurs in the required percent in suitable snow interception habitat, recruit to suitable snow interception habitat in the shortest time frame possible; or
 - ii) that will, when a deficit occurs in the percent allowed in young suitable snow interception habitat, recruit to suitable snow interception habitat and minimize impact on available timber supply; and
- (b) will provide contiguous recruitment habitat patches >20 ha or is adjacent to suitable snow interception habitat such that a contiguous patch is >20 ha; and
- (c) can include young suitable snow interception habitat in excess of the 20% limit, where required.

retention area means the ungulate winter range area maintained in suitable snow interception habitat, recruitment habitat, open suitable habitat or young suitable snow interception habitat to meet the requirements of general wildlife measure 1, 2 and 4.

shallow snow zone means areas of an ungulate winter range that are <400m elevation.

suitable snow interception habitat means capable winter range areas with the following forest attributes:

mature (>100 years old) or old growth (>250 years old) Douglas-fir leading (>40% fir) forest, or MOE defined winter range (Schedule B map), that has been confirmed to have moderate to high deer use as winter habitat; with at least 90% of tree heights >19.5m (up to 10% can come from height class 2) or site index >12; crown closure class >35%; exhibit multiple canopy layers and large well developed crowns; or Spotted Owl Type A habitat (i.e., old forests with superior habitat suitable for spotted owl nesting, roosting, foraging, and dispersal) that is leading Douglas-fir (>40%) with crown closure class >35%.

temporary road means a road that is required only for a limited period during a specific forest management phase leading to, or occurring within, a cutblock. These include: excavated or bladed trails, main skid trails, backspar trails, corduroyed trails, and other similar structures.

traditional and cultural activities is as defined in the *Free Use Permit Regulation*

young suitable snow interception habitat means capable winter range areas with the following forest attributes:

- (a) in the deep snow zone, may include young forests (60-100 years old) leading in Douglas-fir (>40% fir) with crown closures exceeding 55%, and Site Index >12 that comprise up to 20% of the total amount of suitable snow interception habitat.
- (b) in the moderate snow zone in Big Silver, Chehalis, Chilliwack, Coquihalla, East Harrison, Hatzic, Mehatl, Pitt, Silverhope, Spuzzum, Stave, Tretheway, West Harrison and Yale Landscape Units, may include young forests (60-100 years old) leading in Douglas-fir (>40% fir) with crown closures exceeding 55%, and Site Index >12 that comprise up to 20% of the total amount of suitable snow interception habitat.

Schedule 1 – General Wildlife Measures:

1. Within the following ungulate winter ranges: BS1-3, BS4-6, BS7-25, BS8-9, BS9-11, BS13-15, BS16-17, BS18-19, BS20-21, BS24, BS28, BS29-31, BS32, BS32a, BS33, CH2-6, CH7, CH9-11, CH14-16, CH18-19, CL1-3, CL4-6, CL28-31, CL41-43, CQ1-3, CQ4-16, CQ18-26, CQ27-29, CQ30, CQ33-36, CQ38-39, CQ40-44, CQ46, EH2-5, EH7, EH21, EH26, EH32, HT6, MH13-14, MH15-16, MH17-NA33, MH24, PI2-6, SH1-3, SH4-5, SH10-13, SH15-17, SH18-26, SH20-22, SH23-24, SP1, SP4-6, SP14-15, SP19-20, SP21-26, YA1, YA3-AN15, YA4-7, YA8-9, YA10-13, YA11-12, YA16-24, YA18-25, YA26-27, YA31, YA40-48, YA44, YA51-53 located in Big Silver, Chehalis, Chilliwack, Coquihalla, East Harrison, Hatzic, Mehatl, Pitt, Silverhope, Spuzzum, Stave, Tretheway, West Harrison and Yale Landscape Units:
 - (a) (i) maintain at least 65% of the capable winter range area in the deep snow zone in each ungulate winter range as suitable snow interception habitat. Up to 20% of this amount may be comprised of young suitable snow interception habitat.
 - (ii) maintain at least 65% of the capable winter range area in the moderate snow zone in each ungulate winter range as suitable snow interception habitat. Up to 20% of this amount may be comprised of young suitable snow interception habitat.
 - (iii) maintain at least 20% of the capable winter range area in the shallow snow zone in each ungulate winter range as suitable snow interception habitat.

- (b) where sufficient suitable snow interception habitat does not exist to meet the required amount in general wildlife measure 1(a), maintain:
 - (i) open suitable habitat to address any deficit in the amount of suitable snow interception habitat; or
 - (ii) recruitment habitat to address any deficit in the amount of suitable snow interception habitat required.
 - (c) within each ungulate winter range maintain not less than one contiguous area that is ≥ 40 ha of suitable snow interception habitat. Minimum patch size for other retention areas should be ≥ 20 ha, and where retention requirements by snow zone are < 20 ha the small retention amount should be combined with a patch in the adjacent snow zone.
 - (d) if replacement of suitable snow interception habitat, as identified in (a), (b) or (c) above, is considered over time, the replacement snow interception habitat must be equivalent or better in quality and quantity to the original area.
2. Within the following ungulate winter ranges: AI1-4, AI7-8, AI10-30, AI16-19, AI20-23, AI26-28, AI2-AN40, AN3-6, AN7-9, AN8, AN10-12, AN17-22, AN24-27, AN28-29, AN30-33, AN36-38, MA11-16, MA18-46, MA19-28, NA1-6, NA11-16, NA17-19, NA30-32, NA34-36 located in Ainslie, Anderson, Manning, and Nahatlatch Landscape Units:
- (a) (i) maintain at least 60% of the capable winter range area in the deep snow zone in each ungulate winter range as suitable snow interception habitat. Up to 20% of this amount may be comprised of young suitable snow interception habitat.
 - (ii) maintain at least 40% of the capable winter range area in the moderate snow zone in each ungulate winter range as suitable snow interception habitat.
 - (iii) maintain at least 20% of the capable winter range area in the shallow snow zone in each ungulate winter range as suitable snow interception habitat.
 - (b) where sufficient suitable snow interception habitat does not exist to meet the required amount in general wildlife measure 2(a), maintain:
 - (i) open suitable habitat to address any deficit in the amount of suitable snow interception habitat; or
 - (ii) recruitment habitat to address any deficit in the amount of suitable snow interception habitat;
 - (c) within each ungulate winter range, maintain not less than one contiguous area that is ≥ 50 ha of suitable snow interception habitat. Minimum patch size for other retention areas should be ≥ 20 ha, and where retention requirements by snow zone are < 20 ha the small retention amount should be combined with a patch in the adjacent snow zone.
 - (d) if replacement of suitable snow interception habitat, as identified in (a), (b) or (c) above, is considered over time, the replacement snow interception habitat must be equivalent or better in quality and quantity to the original area.
3. Primary forest activities are not permitted within each of the following ungulate winter ranges: AN34, BS23, BS37, CL13, CQ31, CQ37, MA5-7, MA7-11, NA8-9, NA22, NA25-26, PI9, SP22, TR4, YA29, YA34. General wildlife measure 3 does not apply for the purposes of traditional and cultural activities.
4. Within established ungulate winter ranges:
- (a) AI13-15 maintain 4.5 ha of the winter range area in the shallow snow zone as suitable snow interception habitat; and 95.5 ha of the winter range area in the moderate snow zone as suitable

snow interception habitat; and 30.9 ha of the winter range area in the deep snow zone as suitable snow interception habitat.

- (b) AN13-18 maintain 67.5 ha of the capable winter range area in the moderate snow zone in suitable snow interception habitat; and 38.6 ha of the capable winter range area in the deep snow zone in suitable snow interception habitat.
 - (c) MH12 maintain 0.2 ha of the capable winter range area in the shallow snow zone in suitable snow interception habitat; and 86.5 ha of the capable winter range area in the moderate snow zone in suitable snow interception habitat; and 14.4 ha of the capable winter range area in the deep snow zone in suitable snow interception habitat.
 - (d) ST2 maintain 51.0 ha of the capable winter range in the moderate snow zone as suitable snow interception habitat; and 3.1 ha of the capable area in the deep snow zone in suitable snow interception habitat. Design a maximum of two patches for retention.
 - (e) CL7-8 maintain 108.9 ha of the capable winter range area in the moderate snow zone in suitable snow interception habitat; and 67.2 ha of the capable winter range area in the deep snow zone in suitable snow interception habitat.
 - (f) where sufficient suitable snow interception habitat does not exist to meet the required amount in general wildlife measure 4(a)(b)(c)(d)(e), maintain:
 - (i) open suitable habitat to address any deficit in the amount of suitable snow interception habitat; or
 - (ii) recruitment habitat to address any deficit in the amount of suitable snow interception habitat;
 - (f) within ungulate winter range AI13-15 and AN13-18, maintain not less than one contiguous area that is ≥ 50 ha of suitable snow interception habitat. Minimum patch size for other retention areas should be ≥ 20 ha, and where retention requirements by snow zone are < 20 ha the small retention amount should be combined with a patch in the adjacent snow zone.
 - (g) within ungulate winter range CL7-8, MH12 and ST2, maintain not less than one contiguous area that is ≥ 40 ha of suitable snow interception habitat. Minimum patch size for other retention areas should be ≥ 20 ha, and where retention requirements by snow zone are < 20 ha the small retention amount should be combined with a patch in the adjacent snow zone.
 - (h) if replacement of suitable snow interception habitat, as identified in (a), (b), (c), (d) or (e) above, is considered over time, the replacement snow interception habitat must be equivalent or better in quality and quantity to the original area.
5. Before a person carries out primary forestry activities within an ungulate winter range:
- (a) areas of suitable snow interception habitat or any young suitable snow interception habitat, and any required recruitment habitat must be spatially identified on a map. Non-contributing land base areas, as defined by TSR2, known to currently provide suitable snow interception habitat, must be selected as a first priority for meeting the suitable snow interception habitat requirements.
 - (b) the map must be made available upon request of an official of Ministry of Forests and Range or Ministry of Environment.
6. Helicopter logging within an ungulate winter range must be completed between May 1 to November 15 of a calendar year to prevent disturbance to wintering deer.
7. (a) New roads, trails or landings that are required within non-retention ungulate winter range are to be temporary, except when required as mainline roads. Deactivation (as per FPPR s82) of temporary roads, excluding mainline roads, is required within one year after regeneration date if practicable; or otherwise within 1 year after the last silviculture treatment performed to achieve

free to grow.

(b) Do not construct new roads, trails or landings within identified retention areas.

(c) general wildlife measure 7 (b) does not apply to:

(i) the construction of mainline road through retention winter range in CH14-16 and CH18-19, to provide future access up the east side of Chehalis Lake.

(ii) the construction of future temporary road (beginning from existing cutblock F001) through retention winter range in CH7 in Woodlot License 1698 to access timber outside the ungulate winter range.

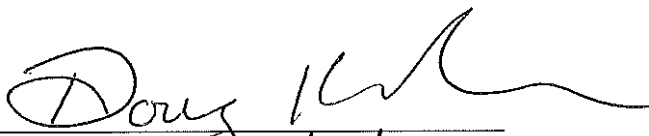
8. Where differences may occur between inventory data and on the ground data, the on-ground data will take precedence in planning for suitable snow interception habitat and timber harvesting. Records pertaining to differences are to be kept on file by licensees and must be made available upon request of an official of Ministry of Forests and Range or Ministry of Environment.

9. Use of pesticides, except as provided by general wildlife measure 10 and 11, is limited to ground based spot treatment within 1m of desirable crop trees.

10. General wildlife measure 9 does not apply to the use of *Bacillus thuringiensis* for the control of western spruce budworm and beetle pheromones for the control of bark beetles.

11. General wildlife measure 9 does not apply for the treatment of invasive plant species and noxious weeds.

12. Within all ungulate winter ranges general wildlife measure 1, 2, 3 and 4 do not apply as necessary to fell trees required for guyline tiebacks in the ungulate winter range. Any trees felled within identified suitable snow interception habitat must be left onsite to provide coarse woody debris. The portion of felled trees that lies in whole, or in part, outside the suitable snow interception habitat may be harvested.



Signed this 22 day of Sept., 2009

Doug Konkin, Deputy Minister

Ministry of Environment

Appendices

These appendices are not part of the legal order for U-2-006, they are intended to provide background information and support to the legal order establishing U-2-006.

Appendix 1

1. Authority to consider an exemption from these general wildlife measures is provided in Section 92(1) of the *Forest Planning and Practices Regulation*. In instances where it is not practicable to comply with these measures, a person proposing to conduct forestry activities should consider seeking an exemption from the requirements to comply with the applicable General Wildlife Measures.

An exemption application should be submitted to the Ministry of Environment's Regional Manager at the Lower Mainland Regional Office – at 10470 152 Street Surrey, BC V3R 0Y3 (a template for exemption requests is available at: <http://www.env.gov.bc.ca/wld/frpa/index.html>). The exemption application must include a rationale describing the nature of the problem and options to integrate winter range conservation with proposed forest practices. This submission will assist in timely consideration of the matter, and will inform the conditions, if any, of the exemption that may be granted prior to commencement of activities. Upon receipt of a complete exemption application, a determination for timing window exemptions will be processed within 10 calendar days, all other exemptions will be handled within 14 calendar days of arrival at the MOE Regional office. Incomplete packages will be returned to the proponent for resubmission.

2. For the purposes of interpreting general wildlife measure 1 (a) & (b), 2 (a) & (b), and 4 (a) to (e) the intent is that moderate to high use deer winter range is designated to meet retention requirements. However, in some winter ranges ideal suitable snow interception habitat and young suitable snow interception habitat (to the 20% limit where allowed) may not exist in sufficient quantity. When this occurs and selection from other forest stand types becomes necessary, select from open suitable habitat or recruitment habitat as needed to meet retention requirements and in attempt to minimize impact to timber supply. See the Table in Appendix 3 for recommended selection order. It is recognized that open suitable habitat comes from stands with low stocking and therefore will likely never recruit to suitable snow interception habitat. For this reason, try to minimize this component.
3. For purposes of general wildlife measure 1, 2 and 4, the intent for non-retention area in ungulate winter range is that it will provide deer forage over a rotation. Harvesting and silviculture activities should therefore be planned accordingly such that forage supply is accommodated over time. Ministry of Environment will be monitoring this component of the winter range.
4. To calculate retention area amounts in general wildlife measure 1, 2 and 4, areas within ungulate winter range mapped as capable winter range habitat were used. In some winter ranges small areas of non-capable habitat may lie within the ungulate winter range boundary. As well, in some winter ranges small areas of capable area may never become suitable and will not be used to contribute towards retention. Engaging the services of a qualified professional will be

helpful in determining suitable snow interception habitat requirements.

5. In regards to general wildlife measure 1 (d), 2 (d) and 4 (h), to consider replacement of identified retention area over time, replacement area that is of similar or better quality (e.g. attributes such as age, stand composition, patch size, snow zone) must be identified to at least an equivalent amount and in the same ungulate winter range. It is important that a qualified professional indicates that the replacement habitat is functioning as suitable snow interception habitat.

To further facilitate replacement, tree species selection and stem density management (e.g. silvicultural activities) in ungulate winter range should result in a mix of large crowns and multiple canopy layers to ensure the stand will recruit to and be eligible for suitable snow interception habitat.

Basic and incremental silviculture activities in ungulate winter range should manage for Douglas-fir as the preferred and leading tree species wherever the ecological characteristics of the forest site are suitable for the purpose.

6. In regards to general wildlife measure 3 and 4 (a) to (e), a different amount of retention from the standard used elsewhere is used for one of three reasons: a) deer winter range habitat extends into an adjacent park and park habitat contributes to the retention amount; b) the winter range size is small and requires 100% retention to remain viable, forage is supplied internally or in adjacent openings; or c) the deer winter range overlaps with spotted owl long term owl habitat areas (LTOHA) and has no access.
7. As per general wildlife measure 5 (a), the “hatched” polygons on Schedule B maps represents MOE defined deer winter range (using TSR 2), as determined by field survey. Both the non-contributing (NCLB) and contributing land bases (THLB) are shown. When spatially identifying areas on a map for the purposes of general wildlife measure 5, consideration should be given to the selection of MOE defined winter range first from the NCLB, then from areas that will minimize impact on available timber supply (i.e. this could be THLB that is not of commercial interest), then from THLB areas. See Appendix 3 for the recommended selection order.

These MOE defined winter ranges are derived from winter field surveys and were known to function as deer winter range under forest conditions at the time of survey. Since these maps were derived from mapping completed in 2001 and 2002, some of the currently suitable snow interception habitat has been harvested. In other cases, MOE defined winter range does not account for small mapable areas of Pine stands, low crown closure, non-forested excluded land, Non-productive brush, or similarly non-forested areas (>1 ha in size). These harvested areas, Pine stands, low crown closure, or non-forested areas are not to contribute towards the percent retention amount (e.g. if a 60 ha patch of otherwise currently suitable snow interception habitat contains 10 ha of non-forested area, count 50 ha towards the target).

8. For situations when retention ungulate winter range overlaps with long term owl habitat area (LTOHA) and habitat enhancement treatment is proposed under the Spotted Owl plan, it will be important for a qualified professional to indicate that any treatment achieves the general wildlife measures in this order. In overlapping deer/LTOHA, emphasis should be placed on carrying out Habitat Enhancement Practices within forests 60-100 years old due to a greater

likelihood that there will be a benefit to deer when comparing pre and post treatment stand conditions (i.e. forest stands age >100 years old likely already provide multiple winter range attributes for deer, while stands aged <100 years may only provide snow interception habitat). It is acknowledged that habitat enhancement opportunities are allowed in older LTOHA forests (>100 years old to usually 140 years old). If treatment in older forest is considered in retention deer winter range a more careful review of compliance with this order should be undertaken. If a conflict between the Spotted Owl Management Plan and this order arises from a proposed forest activity, the proponent needs to first assess their proposal for compliance, and can consider applying for an exemption should it be deemed necessary and biologically appropriate.

9. For general wildlife measure 7 (a), new roads, trails or landings within non-retention ungulate winter range, where required for forestry purposes, should be temporary (except main lines). This is important since the intent of non-retention areas is to provide forage for deer, and deer need to be able to access these areas without added stress or disturbance from humans. Stress and disturbance cause deer to burn important fat reserves, which are critical for deer overwinter survival. Road layout should minimize the length of road required and clearing width should be kept to a minimum. Impacts of roads can be reduced by avoiding routes across ridge breaks or rock outcrops, and by maintaining under-story cover along road edges. The intent of deactivation is such that the road or trail is not driveable with a 4 wheel drive vehicle; and that deactivation is carried out in the shortest time frame possible.

For general wildlife measure 7 (b) where roads are required through retention areas (as provided by exemption), a replacement area of at least equivalent size and value would have to be identified contiguous to the affected retention area. This condition will be part of the exemption.

10. Where an established ungulate winter range is subject to the operations of multiple *Forest Act* agreement holders, which may include areas under Timber Licence and Woodlot Licence, cooperation between licence holders should occur in order to select suitable snow interception habitat in compliance with the general wildlife measures established by this order.
11. In the definition for “open suitable habitat” and “suitable snow interception habitat”, most of the retention area is to come from mature or old forest stands of height class 3 or greater (>19.5 m). A provision for up to 10% from height class 2 (10.5-19.4m) is included to allow some flexibility by inclusion of small areas of shorter trees interspersed with height class 3. It is important to understand that limitations on shorter trees are required since they will generally not provide large crowns to intercept snow.
12. In the definition for “open suitable habitat” and “suitable snow interception habitat” moderate to high deer use is a relative assessment to other areas within that particular UWR polygon.
13. These general wildlife measures do not apply to persons who must comply with the *Worker's Compensation Act* and the regulations under that Act (e.g. danger tree felling); and to carry out road maintenance, road deactivation, brushing or clearing on existing roads within the ungulate winter range. These activities will be carried out in a manner that will not result in a material adverse impact on the suitable habitat.

Appendix 2

Table 1. Ungulate winter range name, retention amount by snow zone, total retention, comments and percent retention.

UWR Name	Shallow Ret'n (ha)	Moderate Ret'n (ha)	Deep Ret'n (ha)	Total Ret'n (ha)	Comments & % retention
AI 10-30		25.8	141.9	167.6	40/60
AI 13-15	4.5*	95.5	30.9	130.9	Skewed to west
AI 1-4	23.0	139.4	37.4	199.8	20/40/60
AI 16-19	4.4*	112.9	8.4*	125.7	20/40/60
AI 2-AN 40	38.5	29.4		67.9	20/40
AI 20-23	12.7*	111.1	35.1	158.8	20/40/60
AI 26-28	2.3*	41.5	75.8	119.5	20/40/60
AI 7-8		77.9	83.2	161.1	40/60
AN 10-12	21.1	89.1	22.6	132.8	20/40/60
AN 13-18	0	67.5	38.6	106.1	Some Ret'n in Park
AN 17-22		97.3	139.0	236.4	40/60
AN 24-27	0.6*	108.2	19.5	128.3	20/40/60
AN 28-29	11.8*	74.2	11.2*	97.1	20/40/60
AN 30-33		64.9	77.9	142.8	40/60
AN 34		60.5	70.0	130.4	100% Small
AN 3-6	3.7*	92.2	64.9	160.8	20/40/60
AN 36-38		80.4	78.1	158.6	40/60
AN 7-9	17.9*	57.7	19.9	95.5	20/40/60
AN 8	8.8*	97.7	12.2*	118.7	20/40/60
BS 1-3	19.3	88.6	40.4	148.3	20/65/65
BS 13-15	20.2	113.8	70.1	204.2	20/65/65
BS 16-17	10.9*	106.6	72.3	189.8	20/65/65
BS 18-19	25.2	86.8	33.4	145.3	20/65/65
BS 20-21	13.7*	96.4	51.8	161.9	20/65/65
BS 23	66.4	91.3		157.7	100% Small
BS 24	9.7*	114.4	19.2	143.3	20/65/65
BS 28	1.2*	81.6	61.7	144.5	20/65/65
BS 29-31	23.3	102.7	74.8	200.8	20/65/65, GWR
BS 32	8.4*	62.9	70.7	141.9	20/65/65
BS 32a	35.0	20.4		55.4	20/65
BS 33		10.6*	63.1	73.6	65/65
BS 37		86.3	49.9	136.3	100% Small
BS 4-6	27.2	114.3	48.3	189.8	20/65/65
BS 7-25	5.7*	97.2	97.6	200.5	20/65/65
BS 8-9	28.7	58.3		86.9	20/65
BS 9-11	5.6*	141.4	2.6*	149.6	20/65/65
CH 14-16	6.1*	118.0	21.9	146.0	20/65/65
CH 18-19		110.0	84.4	194.4	65/65
CH 2-6	0.3*	105.2	83.7	189.2	20/65/65

UWR Name	Shallow Ret'n (ha)	Moderate Ret'n (ha)	Deep Ret'n (ha)	Total Ret'n (ha)	Comments & % retention
CH 7		146.4	53.9	200.3	65/65
CH 9-11		92.3	44.3	136.6	65/65
CL 13		25.3	57.0	82.3	100% Small
CL 1-3		164.3	100.1	264.4	65/65
CL 28-31		55.4	94.3	149.7	65/65
CL 41-43		7.9*	76.3	84.1	65/65
CL 4-6		119.0	120.6	239.6	65/65
CL 7-8		108.9	67.2	176.1	Minor ret'n in park
CQ 1-3		63.4	65.7	129.1	65/65
CQ 18-26		162.7	123.1	285.8	65/65
CQ 27-29		109.8	70.6	180.4	65/65
CQ 30	1.0*	41.1	12.2*	54.2	20/65/65
CQ 31	2.4	50.8	25.7	78.9	100% Small/LTOH
CQ 33-36	4.9*	102.8	66.8	174.5	20/65/65
CQ 37		9.8	54.1	63.9	100% Small/LTOH
CQ 38-39	6.8*	131.7	67.8	206.4	20/65/65
CQ 40-44	16.4*	182.3	87.8	286.5	20/65/65
CQ 4-16		102.9	83.6	186.5	65/65
CQ 46	13.5*	145.0	26.8	185.3	20/65/65
EH 21	7.1*	107.8	28.3	143.1	20/65/65
EH 2-5		74.8	53.0	127.8	65/65
EH 26		123.2	117.2	240.4	65/65
EH 32		24.0	51.2	75.2	65/65
EH 7	5.3*	76.9	82.2	164.4	20/65/65
HT 6	3.2*	78.6	11.7*	93.6	20/65/65
MA 11-16		25.1	179.2	204.2	40/60
MA 18-46			72.7	72.7	60
MA 19-28		17.3*	41.3	58.6	40/60
MA 5-7			118.8	118.8	100% LTOH
MA 7-11		0.5	271.8	272.3	100% LTOH
MH 12	0.2*	86.5	14.4*	101.1	Some Ret'n in Park
MH 13-14	0.5*	188.7	102.7	291.8	20/65/65
MH 15-16		83.1	84.2	167.3	65/65
MH 17-NA 33	4.7*	194.1	110.9	309.7	20/65/65
MH 24		51.4	91.0	142.4	65/65
NA 11-16	2.7*	135.2	104.7	242.6	20/40/60
NA 1-6	10.7*	82.4	15.0*	108.1	20/40/60
NA 17-19	4.7*	122.0	110.3	237.0	20/40/60
NA 22		31.6	31.5	63.1	100% Small
NA 25-26		53.6	43.4	96.9	100% Small
NA 30-32	2.8*	111.2	86.4	200.4	20/40/60
NA 34-36	25.6	59.4	10.2*	95.2	20/40/60
NA 8-9	23.4	50.8	38.2	112.4	100% Small
PI 2-6	47.9	48.6		96.5	20/65
PI 9	2.5	56.1	1.1	59.7	100% Small
SH 10-13		55.7	84.2	139.9	65/65

UWR Name	Shallow Ret'n (ha)	Moderate Ret'n (ha)	Deep Ret'n (ha)	Total Ret'n (ha)	Comments & % retention
SH 1-3	0.0	124.9	83.2	208.1	65/65
SH 15-17		133.5	78.2	211.7	65/65
SH 18-26		157.9	101.7	259.6	65/65
SH 20-22		95.9	109.5	205.4	65/65
SH 23-24		75.1	128.9	204.0	65/65
SH 4-5	2.2*	134.4	70.4	207.0	20/65/65
SP 1	5.7*	60.3	17.9*	83.9	20/65/65
SP 14-15		39.8	60.4	100.2	65/65
SP 19-20		110.4	87.7	198.1	65/65
SP 21-26	12.2*	153.2	57.1	222.5	20/65/65
SP 22	44.3	58.9		103.1	100% Small
SP 4-6	12.9*	79.2	40.0	132.1	20/65/65
ST 2	0.0	51.0	3.1*	54.1	Some Ret'n in Park
TR 4	11.5	92.1	4.1	107.7	100% Small
YA 1	27.3	113.3	11.3*	152.0	20/65/65
YA 10-13	10.4*	94.8	89.8	195.1	20/65/65
YA 11-12		117.9	104.9	222.8	65/65
YA 16-24	0.4*	44.1	61.1	105.7	20/65/65
YA 18-25	25.6	144.2	100.2	270.0	20/65/65
YA 26-27	3.5*	105.6	55.6	164.7	20/65/65
YA 29	51.7	22.3		74.0	100% Small
YA 3-AN 15	8.8*	139.6	0.6*	149.0	20/65/65
YA 31	19.3	54.5		73.8	20/65
YA 34	69.2	35.2		104.4	100% small
YA 40-48	0.1*	129.2	32.1	161.4	20/65/65
YA 44	0.2*	135.7	33.2	169.1	20/65/65
YA 4-7	21.1	161.2	30.9	213.1	20/65/65
YA 51-53	26.8	171.1	31.9	229.9	20/65/65
YA 8-9	17.6*	121.2	74.0	212.8	20/65/65
Grand Total	1012.9	10046.4	6633.8	17693	

Note: small errors in addition are due to rounding.

* represents the snow zones where small retention amounts should be combined with patches in adjacent snow zones as specified in general wildlife measure 1 (c), 2 (c) & 4 (f) (g). Achieving this will help to ensure that retention patches are effective and function as winter range. Note: winter ranges where retention is 100% are not highlighted.

Appendix 3

Table 2. Recommended selection order priority for retention area by suitability type and TSR 2 land base classification (e.g. when retention requirements can not be met by area in priority #1, select from available area in #2, then #3 etc.). A person may choose from THLB categories as a higher priority if that helps minimize overall impact to timber supply while still addressing retention requirements.

Priority	Suitability Description	Additional Description	TSR2 Land Class'n*	Comment
1	Currently Suitable	MOE defined DWR**	NCLB	
2	Currently Suitable		NCLB	
3	Young Suitable	MOE defined DWR	NCLB	Up to 20% Limit
4	Young Suitable		NCLB	Up to 20% Limit
5	Open Suitable	MOE defined DWR	NCLB	
6	Open Suitable		NCLB	
7	Currently Suitable	MOE defined DWR	THLB	
8	Currently Suitable		THLB	
9	Young Suitable	MOE defined DWR	THLB	Up to 20% Limit
10	Young Suitable		THLB	Up to 20% Limit
11	Open Suitable	MOE defined DWR	THLB	
12	Open Suitable		THLB	
13	Young Suitable	MOE defined DWR	NCLB	Above 20% Limit (as recruitment)
14	Young Suitable		NCLB	Above 20% Limit (as recruitment)
15	Recruitment	MOE defined DWR	NCLB	
16	Recruitment		NCLB	
17	Young Suitable	MOE defined DWR	THLB	Above 20% Limit (as recruitment)
18	Young Suitable		THLB	Above 20% Limit (as recruitment)
19	Recruitment	MOE defined DWR	THLB	
20	Recruitment		THLB	

* NCLB = Non-contributing land base

THLB = Timber harvesting land base (contributing & partial contributing)

** MOE defined DWR = this winter range has been confirmed as important/functioning by MOE.



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Appendix 2k

Wildlife: Mountain Beaver



File MWLAP: 135-60/MIWG

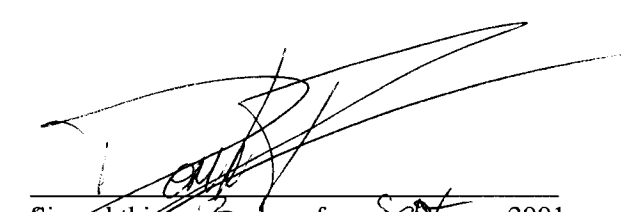
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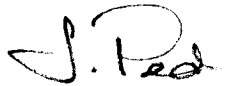
File MOF: 12210-40/FPCODEMIWILDLIFE

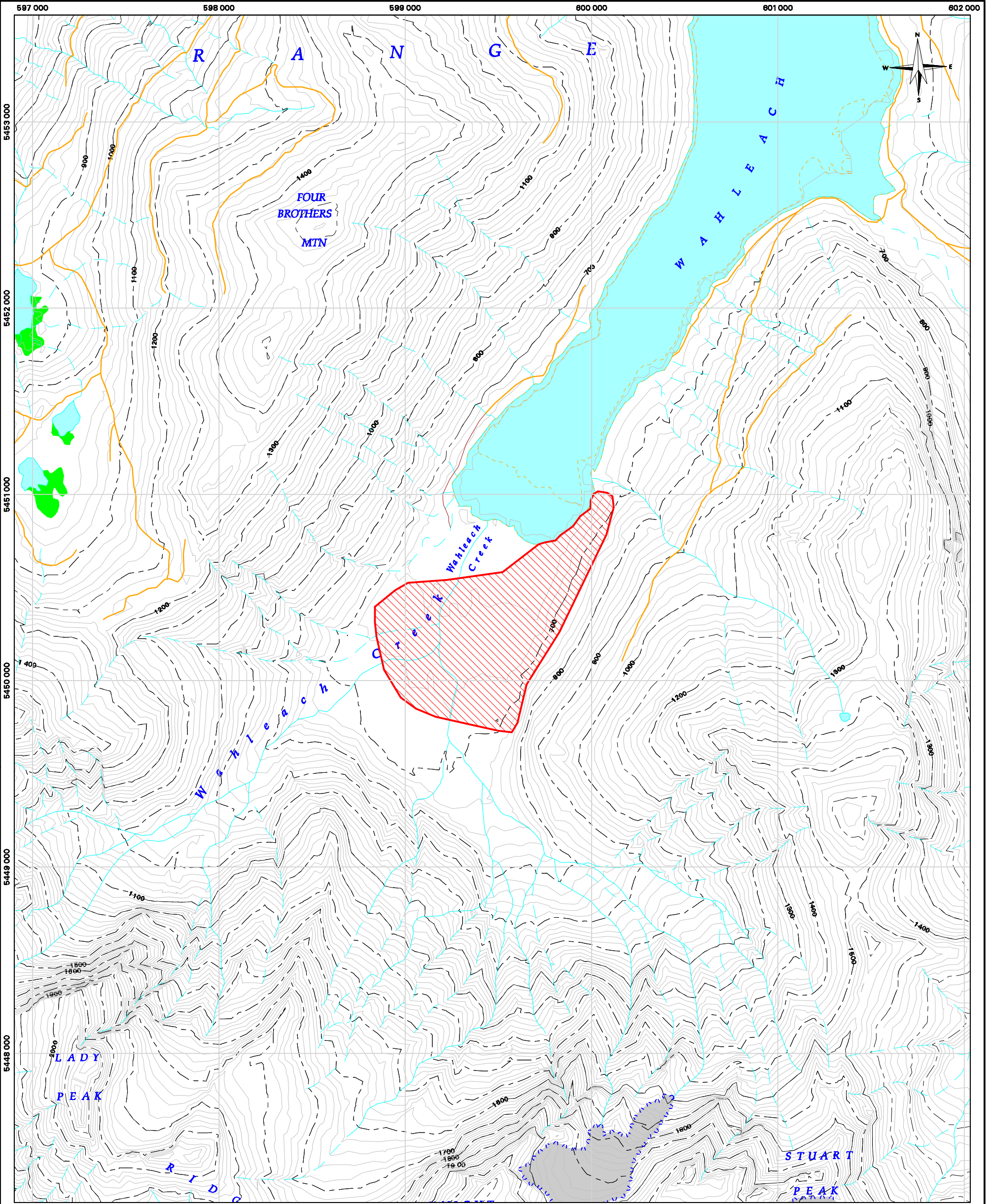
ORDER – WILDLIFE HABITAT AREA # 2- 012

On being satisfied that the establishment of the wildlife habitat area dealt with in this order is necessary to meet the habitat requirements of the identified wildlife, and that the general wildlife measures dealt with in this order are necessary to maintain the identified wildlife within those areas, and under the authority of section 70 (1) (b) and (c), (2), (4), and (5) of the Operational Planning Regulation, B.C. Reg. 107/98, the Deputy Minister of Water, Land and Air Protection and the Chief Forester, acting jointly, order that

- 1 the wildlife habitat area shown in the map set out in the attached Schedule A (#2-012) is established;
- 2 the wildlife habitat area referred to in section 1 is approved for Mountain beaver (*Aplodontia rufa*); and
- 3 the general wildlife measures referred to in Order No. 1 – General Wildlife Measures, dated March 3, 1999 for Mountain beaver (*Aplodontia rufa*) apply to this wildlife habitat area.


Signed this 13 day of Sept, 2001
Derek Thompson, Deputy Minister
Ministry of Water, Land and Air Protection


Signed this 13 day of Sept, 2001
Larry Pedersen, Chief Forester
Ministry of Forests

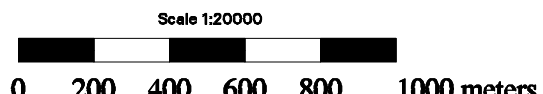
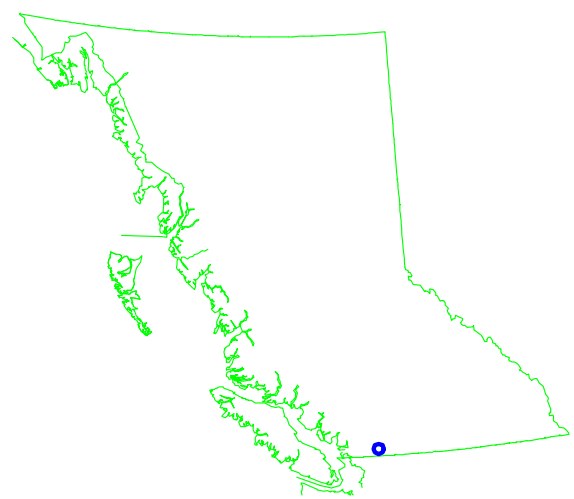


**Schedule A
Wildlife Habitat Area
WHA Number 2-012**

Core area 79 ha

Legend

- | | |
|----------------------------------|--------------------------------|
| Road - Main | River/Stream - Indefinite |
| Road (Gravel Undivided) - 1 Lane | Contour - Index |
| Road (Unimproved) | Contour - Intermediate |
| Road - Paved lanes 2 Undivided | Wildlife Habitat Area - Buffer |
| Rail Line (Single Track) | Wildlife Habitat Area - Core |
| River/Stream - Definite | Marsh |
| River/Stream - Dry | Swamp |



Scale 1:20000

Contour Interval 20 m
Projection UTM Zone 10
Datum NAD 83

For more information contact
Identified Wildlife Management Strategy
Wildlife Branch, Research and Conservation Department
Ministry of Environment Lands and Parks
250-356-7789

Map Produced by the
BC Conservation Data Centre
August 07, 2001





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Appendix 3

Community Watersheds

**Community Watersheds Applicable to Probyn Log Ltd.'s
Forest Stewardship Plan**

Watershed Code	Watershed Name	Watershed Area (ha)	Date Designated
110.006	Domitian Creek Community Watershed	169.4	May 14, 2004
110.104	Elbow Community Watershed	878.4	June 15, 1995
100.122	Adams Spring Community Watershed	3.2	May 14, 2004
100.002	Ascaphus Community Watershed	148.8	June 15, 1995
100.097	Cupola Community Watershed	214.9	June 15, 1995
100.101	Edmeston Community Watershed	7.0	June 15, 1995
100.045	Southbright Community Watershed	4.1	June 15, 1995
100.046	Spring Community Watershed	34.0	June 15, 1995
100.050	Watt Community Watershed	365.5	June 15, 1995
100.118	Young Creek Community Watershed	557.2	May 14, 2004
100.106	Ichilaka Community Watershed	117.0	June 15, 1995
100.029	Kopp Community Watershed	36.2	June 15, 1995
100.102	Edna Community Watershed	15.0	June 15, 1995
110.003	Sasquatch Community Watershed	23.3	June 15, 1995
110.004	Thunderbird Community Watershed	118.2	June 15, 1995
100.013	Dunville Community Watershed	557.9	June 15, 1995
100.015	Elk Community Watershed	1,179.7	June 15, 1995
100.017	Fin Community Watershed	107.8	June 15, 1995
100.028	Knox Community Watershed	7.2	June 15, 1995
100.034	Nevin Community Watershed	579.4	June 15, 1995
100.120	Parent Creek Community Watershed	34.5	May 14, 2004
100.049	Volkert Community Watershed	90.7	June 15, 1995
100.051	Wells Community Watershed	7.5	June 15, 1995
100.119	Cannell Lake Community Watershed	201.2	May 14, 2004
100.011	Deroche Community Watershed	716.9	June 15, 1995
100.026	Kenwothy Community Watershed	298.6	June 15, 1995
100.035	Norrish Community Watershed	7,876.5	June 15, 1995
970.003	Campsite Community Watershed	34.0	June 15, 1995
970.002	Trite Community Watershed	121.3	June 15, 1995
100.113	Stormy Community Watershed	4.9	June 15, 1995
100.098	Choate Community Watershed	34.6	June 15, 1995
100.107	Inkawthia Community Watershed	1,517.1	June 15, 1995
100.112	Skeemis Community Watershed	252.4	June 15, 1995
110.001	Cohen Community Watershed	59.8	June 15, 1995
100.040	Pickney Community Watershed	39.3	June 15, 1995
100.124	Schkam Lake Community Watershed	260.2	May 14, 2004
100.054	Yale Community Watershed	3,734.2	June 15, 1995



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Appendix 4

Visual Quality Objectives



Distribution: JACQUES MARC, Provincial Landscape Specialist, FPB, VICTORIA KEVIN LEE, RVA KLANGDALE, DCAMPBELL, LLEROUX

Document name: \\FSDCK-R1\root\Personal\RSEXSMIT\WPDOCS\TEMP\MGMT\review scenic areas oct 99.doc
RS

CONTACT: Len Leroux

Date typed: 99/10/15 Date revised: 99/10/15 01:44 pm

File: 16290-01
19500-01

October 1, 1999

All Licensees
in the Chilliwack Forest District

Dear Sir or Madam:

The intent of this letter is to clarify licensees obligations regarding scenic area management within the Chilliwack Forest District.

According to Section 1 of the *Operational Planning Regulations* (OPR) "Scenic Areas" are identified through a Visual Landscape Inventory (VLI) or specific planning process. In the absence of higher level plans, the Chilliwack Forest District will use its VLI to identify "Scenic Areas".

Further to the above, Section 1 of the OPR requires that scenic areas be identified and made known at least four months prior to a Forest Development Plan (FDP) submission.

The known scenic areas within the boundaries of the Chilliwack Forest District are the viewsheds associated with:

- Highway 1 - TransCanada
- Highway 3 - Hope-Princeton
- Highway 5 - Coquihalla
- Highway 7 - Lougheed
- Highway 9 - Agassiz-Rosedale



.../2

Ministry of
Forests

Chilliwack Forest District

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9880 South McGrath Road
Rosedale

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Rosedale V0X 1X0

Tel: 604-794-2100
Fax: 604-794-2111

- Highway 11 - Abbotsford-Mission
- Alouette Lake
- Pitt Lake
- Stave Lake as far north as Cypress Point
- Chehalis Lake
- Jones Lake
- Harrison Lake
- Nahatlatch drainage as far east as Mehatl drainage
- Chilliwack Lake Road
- Areas that attract people should be given special consideration. This includes, but is not limited to, local communities, meeting places, parks, sport facilities, shopping malls, rest stops and tourist attractions.

Chilliwack Forest District recently updated its Visual Landscape Inventory to Resource Inventory Committee (RIC) standards. This update included the development of recommended Visual Quality Classes for the *known* scenic areas. The requirements for managing known scenic areas without established VQOs under the Code are as follows:

Proposed Category A cutblocks in scenic areas in a FDP must specify measures that will be carried out to protect forest resources, which include scenic values. (Forest Practices Code Act (FPC) Section 10(1)(c)(ii)). Therefore, a Category A proposed cutblock within a scenic area must be identified on the Mapsheet Cutblock Summary of the FDP as requiring a visual assessment. Recommended visual quality classes (rVQC's), while not legally binding under the FPC, provide an indication of the level of activity that would be acceptable to manage and conserve visual values in known scenic areas.


In order to be satisfied that proposed cut-blocks will adequately manage and conserve the visual resource, I am requesting that visual assessment packages be submitted to this office in support of all Silviculture Prescriptions submitted for cut blocks in *known* scenic areas. However, visual assessment packages must accompany the FDP submissions when the proposed alteration (cut block(s)) approaches or exceeds the alteration percent, in perspective view, for the recommended Visual Quality Class for the viewshed. Reference (FPC Act Section 41(2)).

The content of a visual assessment package will vary depending on the visual sensitivity class, recommended VQC and visual concern for the area. A visual simulation is the preferred method

to confirm that the visual values are being adequately managed and conserved. Acceptable methods include, but are not limited to, sketching, photo manipulation, computer simulation, Digital Terrain Modelling, video imaging or hybrid simulations. In general, high sensitive viewsheds will require the more intensive simulation modelling. The design of the proposed block(s) must consider the visual lines of force present in the landscape, the prescribed percent alteration guidelines for the rVQC and the basic definition for the rVQC.

Please ensure this information reaches the appropriate personnel. Copies of the inventory maps and information are available from the IRM Section of the Chilliwack District Office. If you have any questions or concerns, please contact Ken Langdale, Recreation Supervisor, at 794-2100.

Yours truly,


G. L. (Jerry) Kennah, RPF
District Manager
Chilliwack Forest District



Distribution: Gene Macinnes, Operations Manager; Douglas Campbell, Tenures Officer, Lloyd Davies, Regional Landscape Forester; Jacques Marc, Provincial Landscape Forester;
Document name: G:\!Workgrp\Stewardship\Visual\Licensee Letter GARs17_Oct05.doc LS
Contact: Lucy Stad
Date typed: 2005/10/11 Date last saved: 2005/10/17 1:53 pm

File: 16290-01
19500-09

October 17, 2005

All Forest Licensees, Timber Licensees and Woodlot Licensees

Dear Sir/Madam:

Re: Continuation of existing Visual Quality Classes as Visual Quality Objectives under the *Forest and Range Practices Act (FRPA)*.

The purpose of this letter is to clarify visual management in the Chilliwack Forest District under FRPA. Some important changes have occurred and to assist with your planning activities, I will specify the relevant sections of FRPA and its regulations that apply to scenic areas and visual quality objectives.

Scenic areas were previously made known and established under the *Forest Practices Code of British Columbia (FPC)*. The scenic areas were described in a letter signed by the District Manager on October 1, 1999 and are continued under FRPA section 180. Copies of the letter are available on the web at http://www.for.gov.bc.ca/dck/lim/dck_fsp.html. Scroll down to Visual Landscape Inventory.

Visual Quality Objectives (VQO) can be established or carried forward in various ways under FRPA. I have reviewed the scenarios available and have concluded that the applicable circumstance for the Chilliwack Forest District is to continue the existing recommended Visual Quality Classes (rVQC) into VQOs under the *Government Actions Regulation (GAR)*, section 17.

In GAR section 17, a visual quality class (VQC) is continued as a visual quality objective if the VQC has been set out before October 24, 2002 in a letter from the district manager to forest licensees and the VQC were in existence when the regulation came into force.



Page 1 of 2

Ministry of
Forests

Chilliwack Forest District

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46360 Airport Road
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Fax: (604) 702-5711
Toll Free: 1-800-663-7867

Sir/Madam

I have concluded that the above conditions were met based on the following reasons:

- The District Manager's letter of October 1, 1999 states the requirements for managing scenic areas under the FPC. The rVQC categories were developed and used to determine the acceptable level of activity to manage and conserve the visual values in known scenic areas.
- Since the October 1, 1999 letter, the rVQCs have been used by licensees in their operational plan development by following the district's *Standard Operating Procedures for Visual Resource Management*. It is clear that the statutory decision maker considered the rVQCs in his decisions for visual management of the Forest Development Plans.

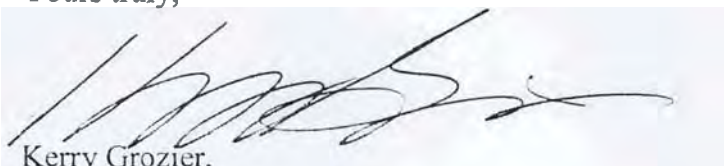
Given the above reasons, I have concluded that it is appropriate to manage the visual resource in the Chilliwack Forest District under the *Government Actions Regulation, section 17*.

When developing your Forest Stewardship Plan (FSP), you are required to identify the scenic areas and to specify results or strategies for the visual objective set under GAR, section 17. Results or strategies for visual objectives can be certified by a qualified professional.

Visual management has changed under FRPA with an emphasis on approved results or strategies in FSPs. We will monitor the implementation of these changes on your operations and on the visual resource. When necessary, scenic area boundaries and established VQOs can be amended under the Government Actions Regulation (GAR).

For your use, I have attached the recently released FRPA Bulletin "Managing Visual Resources". It addresses the recent changes in visual management. If you would like to discuss any of the above items, please contact Lucy Stad or Jack Sweeten, Stewardship Foresters.

Yours truly,



Kerry Grozier,
District Manager

Attachment: FRPA General Bulletin #9 "Managing Visual Resources"



File: 10285-30/Fraser TSA

Date: April 12, 2013

Order to revise the Visual Quality Objectives and Scenic Areas within the Fraser Timber Supply Area

Pursuant to Section 7 (1) and (2) of the Government Actions Regulation (GAR), the following revised Visual Quality Objectives and Scenic Areas are established within the Fraser Timber Supply Area, Chilliwack District, as shown on the map, dated January 31, 2013.



This order and the visual quality objectives in this order take effect on the date the notice of this order is published in the Gazette.

Allan Johnsrude, RPF
District Manager
Chilliwack District



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Appendix 5

Guidelines for Managing Cedar for Cultural Purposes



Guidelines for Managing Cedar for Cultural Purposes

Coast Forest Region
final

January, 2005

Contents

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NOTE: For the purposes of this paper and in respect of interpretation of the referenced provisions of the Forest Act and Free Use Permit Regulation, the references to “traditional and cultural activity” are statutory and regulatory references only, and are not to be read or interpreted as a recognition or admission in law that any particular cultural and traditional uses of cedar referred to are in any manner y representative of practices integral to any First Nation culture qualifying for recognition and affirmation as aboriginal rights pursuant to section 35 of the Constitution Act, 1982.

1.0 Introduction

Western red cedar (*Thuja plicata*) and yellow cedar (*Chamaecyparis nootkatensis*) are considered to be important forest resources to First Nations and to the forest industry in the coastal region of British Columbia. Many First Nation groups in the coastal region have used and continue to utilise red and yellow cedar for traditional and cultural purposes. These *Guidelines for Managing Cedar for Cultural Purposes* (Guidelines) are intended to guide the management of cedar for traditional and cultural use in the context of forest planning in the Coast Forest Region.

The Guidelines have been developed to:

- (a) ensure a consistent approach is undertaken across the Coast Forest Region when working with First Nations regarding the management of cedar for traditional and cultural purposes;
- (b) provide guidance when considering First Nation's cedar interests and assessing the current supply of available cedar; and
- (c) assist in the development of results or strategies for managing cedar for traditional and cultural purposes in forestry operational planning.

The recently enacted *Forest and Range Practices Act* and Regulations define a government objective for cultural heritage resources and factors for consideration by a licensee when developing results or strategies as part of the development of Forest Stewardship Plans (FSP). These Guidelines provide information that could be considered in the development of results or strategies for cedar as a cultural heritage resource. The Guidelines may also assist in assessing cedar supply as part of the Timber Supply Review (TSR) process leading to the allowable annual cut determination by the Chief Forester as well as in developing objectives in strategic planning processes.

These Guidelines were designed to provide a flexible approach that may be considered in the development of appropriate cedar management strategies that reflect the interests of local First Nations and relate to the specific characteristics of a particular planning area.

2.0 Policy & Legislation

The following provincial policies and legislation guide the management of cultural heritage resources, including cedar for cultural and traditional purposes, in the context of forest planning:

2.1 Free Use Permits

Section 48 (1) (g) of the *Forest Act* allows a district manager or forest officer authorised by the district manager to issue a Free Use Permit (FUP) to a person who requires Crown timber to undertake a traditional or cultural activity and which is not for sale to others. Stumpage is not payable on FUPs.

The district manager or authorised forest officer may issue a FUP to a person as a member of a group eligible to harvest timber for traditional and cultural activities, up to a maximum of 50 cubic metres. The district manager or authorised forest officer may issue a FUP to a person as a member of a group for a volume exceeding 50 cubic metres and less than 250 cubic metres where that person has applied and can demonstrate to the satisfaction of the district manager or forest officer that the timber is to be used for the construction of a longhouse, community hall, or other similar structure.

As defined in Section 1 of the Free Use Permit Regulation a "traditional and cultural activity" is any activity that:

- (a) has historically been carried out in British Columbia by members of a group to which the person carrying out the activity belongs;
- (b) is carried out for traditional or cultural purpose of the group; and
- (c) is not carried out for profit, for a commercial purpose or for the purpose of constructing a residential building or a structure associated with a residential building.

Some examples of traditional and cultural uses of timber particular to First Nations include: totem poles, dug-out canoes, longhouses, and firewood required for a community cultural event.

2.2 Timber Supply Review

Determining the allowable annual cuts (AACs) for public forest lands in British Columbia is the responsibility of the Province's chief forester. This responsibility is required by legislation in Section 8 of the *Forest Act*. It states that the chief forester shall specifically consider the following factors:

- (1) The rate of timber production that may be sustained from the area taking into account:
 - the composition of the forest and its expected rate of growth;
 - the time that it will take the forest to become re-established;
 - silviculture treatments, including reforestation;
 - standards of timber utilisation; and
 - constraints on the amount of timber that may be produced due to use of the forest for other purposes.
- (2) The short- and long- term implications to the Province of alternative rates of timber harvesting from the area.
- (3) The economic and social objective of the Crown for the area, region and Province - as expressed by the Minister of Forests.
- (4) Abnormal insect or disease infestations, and major salvage programs planned for the timber on the area.

The timber supply review process involves the analysis of current forest inventories and identifies a sustainable rate of harvest based on a number of forest management assumptions.

It is not a planning tool but can provide information on the current inventory of cedar and predict how the inventory changes over time with current forest management practices. It can also provide information on how timber supply is affected by implementing certain constraints that limit harvesting or change silviculture regimes in ways not covered by current forest management practices.

A copy of the *Forest Act* is available at <http://www.for.gov.bc.ca/tasb/legsregs/minfor/minfact/mofa.htm>

2.3 Strategic Planning Process

Strategic land use planning processes result in the establishment of objectives for resource management on Crown land. Two key strategic planning processes are currently underway in parts of the Coast Forest Region:

Land and Resource Management Plans (LRMPs) are plans that cover a large area and state generally what the land use goals for the area will be. They are developed through discussions facilitated by the government, but with participants from industry, recreational, environmental, First Nations and other sectors of the public. Land use objectives that apply to certain areas covered by the plan may be legally established as a result of an LRMP. Government establishes Land Use Objectives under the *Land Act* and under the *Forest Practices Code Act* of British Columbia.

Landscape Unit Plan objectives are more specific than LRMP objectives. They may relate to a single stand or watershed, and usually involve much more specific objectives. For example, to date landscape unit planning has been used to identify “old growth management areas” – stands of trees necessary for protecting representative samples of old growth forest to ensure biological diversity is protected. An order establishing provincial non-spatial old growth objectives effective June 30, 2004 will guide the landscape unit planning process. A copy of the Order is available at: <http://srmwww.gov.bc.ca/rmd/oldgrowth/index.htm>.

Objectives set through strategic planning processes provide direction to forestry operational planning processes. Objectives may be set for resource values such as cultural heritage resources, cedar and or old growth.

2.4 Forest & Range Practices Act and Regulations –Operational Planning

The *Forest and Range Practices Act* (FRPA) legislation and regulations were recently enacted and provide a legal framework for the development of Forest Stewardship Plans (FSP). FSPs replace forest development plans under the *Forest Practices Code* as the new form of operational plan. FSPs are required to identify results and/or strategies to address a range of objectives set by government. Objectives may be set through strategic land use planning processes, by regulation and by Ministerial Order pursuant to the *Government*

Actions Regulation. Key aspects of the legislation and regulations that may be relevant to cedar management are outlined below.

Forest Stewardship Plans

The *Forest Planning and Practices Regulation* provides details on the content and planning requirements for Forest Stewardship Plans. The *Forest Planning and Practices Regulation* also includes objectives set by government and in some cases default results or strategies for a number of resource values.

Cultural Heritage Resource Objectives and Factors

The *Forest Planning and Practices Regulation* outlines the objectives set by government with which results or strategies included in Forest Stewardship Plans must be consistent. Section 10 outlines the objective set by government for cultural heritage resources which is to conserve, or if necessary, protect cultural heritage resources that are:

- (a) the focus of a traditional use by an aboriginal people that is of continuing importance to that people, and
- (b) not regulated under the *Heritage Conservation Act*.

Section 12 (1) of the *Forest Planning and Practices Regulation* indicates that:
a person who prepares a Forest Stewardship Plan under Section 5 (1) (b) of the FRPA, may consider the factors set out in the Schedule when specifying results or strategies for established objectives.

Under Section 4 of the Regulation the following factors apply to a result or strategy for the objective set out in Section 10:

- (a) the relative value or importance of a particular cultural heritage resource to a traditional use by an aboriginal people;
- (b) the relative abundance or scarcity of a cultural heritage resource that is the focus of a traditional use by an aboriginal people;
- (c) the historical extent of a traditional use by an aboriginal people of a cultural heritage resource;
- (d) the impact on government granted timber harvesting rights of conserving or protecting a cultural heritage resource that is the focus of a traditional use by an aboriginal people; and
- (e) options for mitigating the impact that a forest practice might have on a cultural heritage resource that is the focus of a traditional use by an aboriginal people.

Review and Comment

Under the review and comment Section 21 (1) of the *Forest Planning and Practices Regulation* a person who publishes notice under Section 20 must, during the period specified in the notice:

- (d) make reasonable efforts to meet with First Nation groups affected by the plan to discuss the plan or amendment.

When responding to review and comment under Section 22 (1) a person who publishes a notice under Section 20 (1):

- (a) must consider any written comments received under Section 21 that are relevant to the plan; and
- (b) is not required to consider comments in respect of :
 - (i) areas described in Section 14 (1) (b), (1) (c), (3) (a) or (4);
 - (ii) results or strategies that relate to areas referred to in subparagraph (i).

Resource Features

Section 3(1) of the *Government Actions Regulation*, provides that subject to subsection (2) of the *Regulation*, the Minister may identify the following as a resource feature:

- (f) a cultural heritage resource that is the focus of a traditional use by an aboriginal people and that is not regulated by the *Heritage Conservation Act*.

Section 3(2) of the *Regulation* states that:

The Minister may make an order under subsection (1) if the minister is satisfied that the resource feature requires special management that has not otherwise been provided for under this regulation or another enactment.

Section 3(3) of the *Regulation* states that the identification of a resource feature under subsection (1):

- (a) may be by category or type, and may be restricted to a specified geographical location and;
- (b) must be sufficiently specific to enable a person affected by it to identify the resource feature in the ordinary course of carrying out forest practices or range practices.

Forest Planning and Practices Regulation, Section 70 (1) states that:

Unless exempted under section 91(5), an authorised person who carries out a primary forest activity must ensure that the primary forest activity does not damage or render ineffective a resource feature.

A copy of the *Forest & Range Practices Act* is available at <http://www.for.gov.bc.ca/psearch/fpcfnd.htm>

A copy of the *Heritage Conservation Act* is available at www.archaeology.gov.bc.ca

2.5 Aboriginal Rights & Title Policy Consultation Guidelines

The Ministry of Forests' *Aboriginal Rights and Title Policy* (January 2003) outlines MoF's approach to First Nations consultation and accommodation. A copy of the *Aboriginal Rights & Title Policy and Consultation Guidelines* is available at:

<http://www.for.gov.bc.ca/haa/Policies.htm>

The MOF meets its legal obligations to First Nations by carrying out consultation processes on proposed operational plans and administrative decisions where First Nations have aboriginal interests (asserted aboriginal rights and/or aboriginal title that in most instances have not been established or proven through a court process) within the area under the decision. A key objective of this process is for First Nations to specify their aboriginal interests in the area proposed for development, and how these aboriginal interests may be potentially infringed by the proposed decision.

Where aboriginal interests and potential infringement of such interests are identified, measures appropriate in the circumstances, to accommodate or address those issues need to be identified. In making an operational or administrative decision, the delegated decision makers must consider the information provided and the measures taken to address those potentially affected aboriginal interests.

In the context of operational plans, as proponents, licensees play an important role in explaining the FSP, objectives, and results or strategies to First Nations. They are also responsible for gathering information about First Nation's interests, including information on cultural heritage resources, in the plan area and identifying possible measures to address issues in the context of their proposed plan.

The delegated decision maker will consider the information and the adequacy of consultation prior to making his/her decision.

3.0 Guidelines for Managing Cedar for Traditional & Cultural Purposes

In the context of forest planning and management decisions, the management of cedar for traditional and cultural purposes may be a relevant consideration depending upon the First Nation and the location of the proposed development.

The proposed process as outlined below includes three steps that may be considered when developing short and/or long term strategies for managing cedar for traditional and cultural purposes:

- (1) assessment of cultural cedar needs;
- (2) analysing cultural cedar supply; and
- (3) management considerations.

Prior to initiating the three steps outlined in detail below, information should be gathered regarding any specific objectives that may already have been set by government to guide the management of cedar in the area in question. For example, specific objectives may be set for cultural heritage resources such as cedar through strategic land use planning processes. Measures may be in place to ensure access to cedar for cultural use through the establishment of Old Growth Management Areas. An opportunity also exists for the Minister to establish a cultural heritage resource as a resource feature under the *Forest and Range Practices Act*, which could restrict forest practices that may impact those resource features. In certain areas, there may be specific stocking standards established for cedar. The Chief Forester may also have provided direction in a specific management unit to assess cedar inventories and ensure availability for cultural use.

It may not be necessary to carry out each of these steps in every planning context, and in the order suggested. For example, information generated through a timber supply review process or a strategic planning context may be available and used in operational planning.

Appendix III contains a flow chart that outlines a process that could be considered when developing short and long term strategies for managing cedar for traditional and cultural purposes.

3.1 Cultural Cedar Needs

A first step in the process is to work with First Nations who claim a cultural and traditional use of cedar to gather information regarding cedar needed for cultural and traditional purposes.

This may be achieved by working with a First Nation in a community based process that would allow community members to articulate their uses for red and yellow cedar, identify their short and long term cedar needs by end use, identify some key characteristics of the cedar needed for traditional and cultural purposes (size, age and quality of cedar used), assist in determining feasibility of access to cedar, and generally address any additional issues that may arise. It may be appropriate to specify a timeframe for concluding this work.

First Nation's interests in cedar for cultural use may be identified as part of a broader information sharing or consultation process associated with a particular plan or decision making process. In addition, some First Nations may have already completed work on a cedar strategy that may be made available to the Ministry of Forests and licensees. Where information regarding current cultural cedar needs is unavailable, it may be appropriate to review existing information or records related to cedar use in a particular planning area.

In the context of Forest Stewardship Plans, information gathered from First Nation groups regarding cedar needed for traditional and cultural purposes is consistent with the following factors as laid out in Section 4 of the Schedule of factors to the *Forest Planning and Practices Regulation*:

- (a) the relative value or importance of a particular cultural heritage resource to a traditional use by an aboriginal people;
- (c) the historical extent of a traditional use by an aboriginal people of a cultural heritage resource.

A detailed description of the steps involved to assist in the assessment of cedar needs can be found in Appendix II of this document.

3.2 Analysing Cultural Cedar Supply

Based on information gathered from First Nations regarding their cultural cedar needs, the supply of cedar within a First Nations asserted traditional territory or within a planning unit should be assessed to determine if those cedar needs can be met. The cedar supply analysis could involve a review of the supply of cedar using forest cover information to determine the presence of cedar by volume and age class and producing summaries of area and volume with cedar meeting the cultural needs specifications in the inventory. A next step would involve spatial analysis where maps are produced showing the area, age class, and volumes of cedar that meet the cultural cedar needs within a First Nation's asserted traditional territory or within a planning unit. It may be appropriate to examine operational cruise data and/or scale information to assist in identifying where cedar meeting certain criteria can be found. For example, cruise information may assist in the identification of large, high quality old growth cedar trees needed for canoe building, as specific information about the quality of cedar may not be available from the forest cover information.

The results of this analysis may be considered in the development of management approaches, including results or strategies for cedar as a cultural heritage resource in the context of a forest stewardship plan. The analysis of cedar supply is consistent with some of the factors relating to the objective set by government for cultural heritage resources as outlined in Section 4 of the Schedule of factors to the *Forest Planning and Practices Regulation*:

- (b) the relative abundance or scarcity of a cultural heritage resource that is the focus of a traditional use by an aboriginal people.

A detailed description of the steps involved to assist in analysing cultural cedar supply can be found in Appendix II of this document.

3.3 Considerations for Managing Cedar

A range of potential short and long term management approaches have been identified and could be implemented in the context of forest planning. Different approaches may be relevant depending on short term access issues versus long-term access. There may be situations where, as a result of the supply analysis, it is clear that the supply of cedar available can meet the needs through current management approaches. There may be other situation where short and/or long term stewardship measures for cedar may be appropriate. For example, where bark stripping of cedar trees is an ongoing use, ensuring that stands of cedar

meeting the age class and quality specification available in the general area may be a strategy to consider. In areas where monumental cedar (very large good quality cedar) needed for canoe building is rare, good quality monumental cedar may be mapped and included in retention areas. For the long term, recruitment of cedar to meet the specifications for canoe building may be an approach considered. If through the supply analysis it is determined that large good quality cedars are rare and require special management, the Minister has an ability to establish a resource feature that could ensure those features are not impacted by forest development activities. These options in no way limit the range of potential approaches or results or strategies that could be used to manage cedar for cultural and traditional purposes and are provided as examples only.

The potential management approaches outlined are consistent with factors relating to the objective set by government for cultural heritage resources as outlined in Section 4 of the Schedule of factors to the *Forest Planning and Practices Regulation*:

- (e) options for mitigating the impact that a forest practice might have on a cultural heritage resource that is the focus of a traditional use by an aboriginal people.

A detailed description of the steps involved for consideration when managing cedar for cultural purposes can be found in Appendix II of this document.

4.0 Roles & Responsibilities

The legal responsibility to consult with aboriginal groups rests with the Crown.

The forest industry must meet legislative requirements as well as contractual obligations and may supply additional information to assist the Ministry of Forests in meeting the Crown's duty to consult and if appropriate, accommodate First Nations.

5.0 Implementation

These Guidelines may be relevant for consideration in a range of forest management and planning processes. In strategic planning processes, an assessment of First Nation's interests with respect to cedar for cultural use and analysis of the cedar supply may result in the setting of land use objectives related to cedar management. Work is ongoing in this regard in the LRMP process on the Queen Charlotte Islands.

The Timber Supply Review process may provide an opportunity to analyse the supply of cedar in a particular management unit, assess current practices for cultural heritage resources and conduct sensitivity analysis in relation to cedar management approaches. The TSR process is not a planning process and cannot specify particular strategies for cedar

management. However, in the context of a tree farm licence (TFL) management plan, approaches to address cedar for traditional and cultural purposes may be identified.

In the operational planning process, licensees are required to include results or strategies in Forest Stewardship Plans that are consistent with the cultural heritage resource objective set by government. Cedar may be a cultural heritage resource that should be considered in the development of results or strategies. Licensees may wish to consider these Guidelines in the development of results or strategies for cedar where appropriate.

In terms of timelines, it is recommended that the process of identifying a First Nation's cultural cedar needs and reviewing the inventory for cedar that meets those needs begin as early in the planning process as possible. For example, licensee may wish to begin discussions with First Nations regarding cultural heritage resources within a FSP area prior to the draft plan being made available for the review and comment period. Timelines set for concluding the assessment work should be consistent with timelines for that particular planning process.

Ideally, the cultural needs analysis and cedar supply analysis will be produced for a particular First Nations asserted traditional territory. However, where a planning area includes only a portion of that territory, it may be appropriate for licence holders with operations within the First Nation's asserted traditional territory to collaborate on cultural needs analysis or cedar supply analysis. If this is not possible, the supply analysis and any or all management approaches may be applied on a proportionate basis relative to the planning area under consideration within a First Nation's asserted traditional territory.

There may be circumstances where the Ministry of Forests has gathered some of the information regarding First Nations cedar needs or has conducted some analysis related to cedar supply. This information will be made available to the licensees and can be considered in the development of results or strategies for cultural heritage resources as part of the Forest Stewardship Plans.

These Guidelines represent a tool that may be used to manage cedar for cultural purposes.

Appendix I - Acknowledgements

This document has been prepared with the help of the following individuals:

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Appendix II – Tables and Flow Chart

The following table describes Steps 1 to 10 as outlined in the flow chart attached:

Steps for Reviewing Cultural Cedar Needs

STEP	DESCRIPTION OF ACTION	FURTHER ACTION (AS REQUIRED)
1	<p>First Nation (FN) has expressed concern about cedar for cultural & traditional use:</p> <ul style="list-style-type: none"> • In consultation process? • Operational plan (Forest Stewardship Plan (FSP)Forest Development Plan (FDP)? • Administrative decision (Allowable Annual Cut (AAC)) determination; licence replacement? <p>Note: Several FN have already expressed this concern in recent consultation processes:</p> <ul style="list-style-type: none"> • Some cedar assessment work already underway • In some cases there are interim measures agreement that references the need to assess cedar for traditional & cultural purposes 	
2	Review whether there is a strategy already in place through previous processes (i.e. AAC determinations FDP, other)	If YES, go to Step 13 If NO, go to Step 3
3	Initiate information sharing in order to determine the level of cedar needs. This may include letter to the respective FN and follow-up meetings.	
4	<p>Request a summary of FN cedar needs & use from FN:</p> <ul style="list-style-type: none"> • <u>Context (for traditional &cultural use)</u> • <u>Quantity by end use (prefer not to use m3)</u> <ul style="list-style-type: none"> - each FN will need to identify the intended end use of their cedar needs through discussions directly with First Nations • <u>Quality of cedar needed for uses</u> <ul style="list-style-type: none"> - Size of logs - Grade information - Length and diameter - Characteristics of ideal logs - Workable characteristics • <u>Access Considerations</u> <ul style="list-style-type: none"> - Within FN’s asserted traditional territory - Preferred locations - Reasonable access - Slope, aspect considerations - Time of year - FN ability to access logs • <u>Timelines need to be identified:</u> <ul style="list-style-type: none"> - Short term- 5-10 years, long term up to 250 years 	

STEP	DESCRIPTION OF ACTION	FURTHER ACTION (AS REQUIRED)
5	FN internal needs assessment completed	
6	Licensee/MoF follow up with FN - <i>may require follow-up letters/meetings if no information is received</i>	
7	Has FN provided information on cedar use/needs? <ul style="list-style-type: none"> • Licensee and MoF should communicate to ensure information received from FN is shared with licensees/MoF 	If YES, go to Step 10 If NO, go to Step 8
8	If Step 7 is no, document efforts to obtain information of FN cultural cedar needs	
9	Summarise historical information such as: <ul style="list-style-type: none"> • Free Use Permit (FUP) information • Cedar provided by licensee for FN cultural use (i.e. not in a FUP) • Other local district or licensee knowledge of FN cultural use (i.e. received from other traditional territories) 	
10	Use FN cultural assessment (and information in Step 9) to prepare summary of information gathering process and analysis of cedar needs: <ul style="list-style-type: none"> • Use FN needs assessment submission (if received) • Summary of past use (FUPs, licensee donations, local knowledge) to provide some guidance • Document information exchange efforts with FNs 	Go to Step 11

The following table describes Steps 11 to 11E as outlined in the flow chart:

Steps for Analysing Cultural Cedar Supply

STEP	DESCRIPTION OF ACTION	FURTHER ACTION (AS REQUIRED)
11	<p>Determine from the Needs Assessment</p> <ul style="list-style-type: none"> • What is the supply analysis to focus on? • Examples: <ul style="list-style-type: none"> - Trees suitable for canoes - Trees suitable for bark stripping - Trees suitable for carving - Any specific accessibility requirements, etc. 	
11A	<p>Determine what information, summaries, or analyses already exist.</p> <ul style="list-style-type: none"> • Examples: <ul style="list-style-type: none"> - Timber Supply Reviews - District work - Trees suitable for carving - Work done by licensees - Management Plans - Archaeological Assessments / Surveys - Ecological Classifications, etc. <p>Roll up summaries by asserted traditional territory, where possible. Review results with the First Nation. Do they address the issue? Short or long term?</p>	<p>If NO, go to 11B If YES, go to 12A</p>
11B	<p>Complete non-spatial analysis of Forest Cover information of Cedar presence by volume and age class. Summarize info by category:</p> <ol style="list-style-type: none"> 1. Timber Harvesting Land Base (THLB) 2. 'Reserved' areas: Old Growth Management Areas (OGMAs) ungulate winter range (UWR), Riparian, Parks 3. Inoperable 4. Tenure (include First Nation tenure) <p>Build analysis to report for Cedar (Cw), Cypress (Cy), and Cedar/Cypress:</p> <ol style="list-style-type: none"> 1. % of area & volume that is Cw, Cy, Cw/Cy leading 2. % of area & volume that is Cw, Cy, Cw/Cy secondary and minor 3. Age Classes 4. A summary of Cw, Cy, Cw/Cy reforestation efforts, etc. <p>Roll up summaries by asserted traditional territory, where possible. Review results with the First Nation. Is the issue addressed? Short or long term?</p>	<p>If NO, go to 11C If YES, go to 12A</p>

11C	<p>Complete spatial summary of Forest Cover information.</p> <p>Summarize info by category:</p> <ol style="list-style-type: none"> 1. Timber Harvesting Land Base (THLB) 2. 'Reserved' areas: OGMA, UWR, Riparian, Parks 3. Inoperable 4. Tenure (include First Nation tenure) <p>Build maps to show for Cedar(Cw) Cypress(Cy), and Cedar/Cypress:</p> <ol style="list-style-type: none"> 1. % of area & volume that is Cw, Cy, Cw/Cy leading 2. % of area & volume that is Cw, Cy, Cw/Cy secondary and minor 3. Age Classes 4. A summary of Cw, Cy, Cw/Cy reforestation efforts, etc. <p>Roll up summaries by asserted traditional territory, where possible. Review results with the First Nation. Is the issue addressed? Short or long term?</p>	<p>If NO, go to 11D If YES, go to 12A</p>
11D	<p>Decide to pursue further analysis, stewardship, or some combination.</p> <p>Pursue further analysis.</p> <p>Pursue stewardship.</p>	<p>If YES, go to 11E If YES, go to 12A</p>
11E	<p>Pursuing further analysis. Examples of further analysis include:</p> <ol style="list-style-type: none"> 1. Using operational cruise info to predict existence of Cedar >70 cm through to 250 yrs. 2. Compare inventory and scale production data to estimate grade distribution in unharvested areas. 3. Carry out a modeling approach to identify potential locations of monumental cedar within a specified landbase- field verification could be used to confirm the presence of large old growth cedars. <p>Note: These analyses are examples only. Differences in information availability will prevent these from being completed on every operating area.</p> <p>Roll up summaries by asserted traditional territory, where possible. Review results with the First Nation. Is the issue addressed? Short or long term?</p>	<p>If NO, go to 11D If YES, go to 12A</p>

The following table describes Steps 12A to 13 as outlined in the flow chart:

Steps for Cultural Cedar Strategies

STEP	DESCRIPTION OF ACTION	FURTHER ACTION (AS REQUIRED)
12A	Using information from FN need analysis (Steps 7-10) and supply analysis (Steps 11-11E), an in-depth comparison of cultural cedar availability should be made as to whether short term or long term needs can be met	
12B	Does the review in Step 12A show the cedar supply is available for both the short and long term within the FN asserted traditional territory	If YES, go to Step 13 If NO, go to Step 12C
13	Review complete. Prepare summary of short and long term cedar available Note: this may require follow-up information sharing meeting with FN	Go to Step 14
12C	Does the review in Step 12A show cultural cedar supply is available in the short term within the FN asserted traditional territory	If YES, go to 12 D If NO, go to 12E
12D	Does the review in Step 12A show cultural cedar supply is available in the long term within the FN asserted traditional territory	Go to 12G
12E	Does the review in Step 12A show cultural cedar supply is not available in the short or long term within the FN asserted traditional territory	If YES, go to Step 12F and 12G simultaneously If NO, go to 12F only
12F	<p>START OF SHORT TERM STRATEGY. Consider the examples of short term options listed below to mitigate impacts in short term where cultural cedar supply is limited:</p> <ul style="list-style-type: none"> • Can FN access cedar through existing tenure or proposed tenures • Can FN access cedar in operationally constrained areas such as Old Growth Management Areas (OGMAs), Wildlife Habitat Areas (WHAs), Forest Ecosystem Networks (FENs), Riparian Management Areas (RMAs), Wildlife Tree Patches (WTPs)? Access to cedar in these areas should not compromise the intent of those management areas or the other values in the area. Discussions with MSRM, WLAP recommended. • Can FN access cedar in high retention/low intensity logging areas? Examples may include areas in special management zones or where non timber values have resulted in lower harvest levels (i.e. old growth stewardship areas) • Are areas or resource features identified that protect cedar for cultural and traditional use? Can rare features be inventoried 	

	<p>and located by GPS?</p> <ul style="list-style-type: none"> • Can FN access cedar from neighbouring FN? Have previous arrangements or understanding been made where a FN with available cedar can supply short-term amounts of cultural cedar? • Can FN access cedar from licensees operating areas prior to harvesting? • Can FN access cedar from protected areas (Parks)? This will require clear communication between the various agencies such as Ministry Water land and Air Protection (WLAP) and/or Parks Canada • Can cedar be acquired from other sources, including log dumps, and current licensee operations? • Can the short term strategies temporarily bridge the gap until further analysis can be done through the Timber Supply Review process to assess long term supply issues and then develop long term strategies as appropriate. 	
12G	<p>START OF LONG TERM STRATEGY. Consider the following options as examples available to mitigate impacts in long term where cultural cedar supply is limited:</p> <ul style="list-style-type: none"> • Can FN access cedar through existing or proposed long-term tenures? In some instances, FN have access to a long term tenure arrangement where cultural cedar can be managed • Can FN access cedar in operational constrained areas such as OGMAs, WHAs, FENs, RMAs, WTPs, etc.)? Access to cedar in these areas should not compromise the intent or the other values in the area. Discussions with MSRM, WALP recommended • Will recruitment by growing site or establishment of 2nd growth cedar stands assist in a long-term strategy? Some other thoughts to consider: <ul style="list-style-type: none"> a) Is there a need to reforest with more cedar? b) plan for longer rotations? c) encourage silviculture treatments (i.e. thinning) to produce a desired objective? d) develop specific management practices that could produce the cultural products FN wish to have in future? • Can FN access cedar in high retention/low intensity logging areas? Examples may include areas in special management zones or where non timber values have resulted in lower harvest levels (i.e. old growth stewardship areas)? • Can FN access cedar from protected areas (Parks)? This will require clear communication between the various agencies such as WLAP and/or Parks Canada • Are areas or resource features identified that protect cedar for cultural and traditional use? Can rare features be inventoried and located by GPS? • Are areas identified in an AIP or is a treaty settlement nearing completion? 	
13	Review complete. Prepare summary of short and long term cedar available for decision-maker	Go to Step 14 END

	Note: this may require follow-up information sharing meeting with FN	



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Appendix 6

Invasive Plant Species Specified in the Invasive Plant Regulation

PDF Version

[Printer-friendly - ideal for printing entire document]

INVASIVE PLANTS REGULATION

published by Quickscribe Services Ltd.



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INVASIVE PLANTS REGULATION

B.C. Reg. 18/2004

[effective Jan. 31, 2004]

Contents

1. Application of sections 16 (2) and 37 (2) of the Act
2. Invasive plant species specified

[Provisions of the *Forest and Range Practices Act*, SBC 2002, c. 69, relevant to the enactment of this regulation: sections 47 and 141]

**Application of sections 16 (2) and
37 (2) of the Act**

1. Until June 1, 2004, this regulation applies immediately, despite sections 16 (2) and 37 (2) of the Act, to a forest stewardship plan, woodlot licence plan, range use plan, and range stewardship plan, as applicable.

Invasive plant species specified

2. For the purposes of section 47 of the Forest and Range Practices Act, the prescribed species of invasive plants are as follows:

Weed Species
Scientific name

Anchusa
Anchusa officinalis

Baby's breath *Gypsophila paniculata*

Black knapweed *Centaurea nigra*

Blueweed *Echium vulgare*

Brown knapweed *Centaurea jacea*

Bull Thistle *Cirsium vulgare*

Canada Thistle *Cirsium arvense*

Common Burdock *Arctium minus*

Common Tansy *Tanacetum vulgare*

Dalmatian Toadflax *Linaria dalmatica*

Diffuse Knapweed *Centaurea diffusa*

Field Scabious *Knautia arvensis*

Giant Knotweed *Polygonum sachalinense*

Gorse *Ulex europaeus*

Hoary Alyssum *Berteroa incana*

Hoary Cress *Cardaria draba*

Hound's-tongue *Cynoglossum officinale*

Japanese Knotweed *Polygonum cuspidatum*

Leafy spurge *Euphorbia esula*

Marsh Thistle *Cirsium palustre*

Meadow Hawkweed *Hieracium pilosella*.

Meadow Knapweed *Centaurea pratensis*

Nodding Thistle *Carduus nutans*

Orange Hawkweed *Hieracium aurantiacum*

Oxeye Daisy *Chrysanthemum leucanthemum*

Perennial pepperweed *Lepidium latifolium*

Plumeless Thistle *Carduus acanthoides*

Puncture vine *Tribulus terrestris*

Purple Loosestrife *Lythrum salicaria*

Rush Skeletonweed *Chondrilla juncea*

Russian Knapweed *Acroptilon repens*

Scentless Chamomile *Matricaria maritima*

Scotch broom *Cytisus scoparius*

Scotch Thistle *Onopordum acanthium*

Spotted Knapweed *Centaurea maculosa*

St. John's-wort *Hypericum perforatum*

Sulphur Cinquefoil *Potentilla recta*

Tansy ragwort *Senecio jacobaea*

Teasel *Dipsacus fullonum*

Yellow Iris *Iris pseudacorus*

Yellow starthistle *Centaurea solstitialis*

Yellow toadflax *Linaria vulgaris*

[Provisions of the *Forest and Range Practices Act*, SBC 2002, c. 69, relevant to the enactment of this regulation: sections 47 and 141]

Invasive Plant Species Identified in the Invasive Plants Regulation

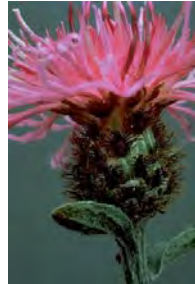
Anchusa



Baby's Breath



**Black
Knapweed**



Blueweed



**Brown
Knapweed**



Bull Thistle



**Canada
Thistle**



**Common
Burdock**



**Common
Tansy**



**Dalmatian
Toadflax**



**Diffuse
Knapweed**



Field Scabious



**Giant
Knotweed**



Gorse



**Hoary
Alyssum**



Hoary Cress



**Hound's-
tongue**



**Japanese
Knotweed**



Leafy Spurge



Marsh Thistle



**Meadow
Hawkweed**



**Meadow
Knapweed**



**Nodding
Thistle**



**Orange
Hawkweed**



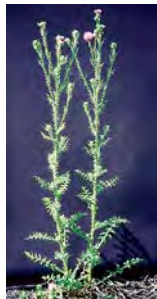
Oxeye Daisy



**Perennial
Pepperweed**



**Plumeless
Thistle**



Puncture Vine



**Purple
Loosestrife**



**Rush
Skeletonweed**



**Russian
Knapweed**



**Scentless
Chamomile**



**Scotch
Broom**



Scotch Thistle



**Spotted
Knapweed**



St. John's-wort



**Sulphur
Cinquefoil**



Tansy Ragwort



Teasel



Yellow Iris



**Yellow
Starthistle**



Yellow Toadflax





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Appendix 7

Recreation

Guidance Document for Established Recreation Trails with Legal Objectives in the Chilliwack River Valley

Guidance – High value trail	
1. Preserve the integrity of the forested, scenic and natural recreation experience associated with the high value recreation trail.	
Measure/Indicator	Targets/actions
1.1 Road crossings	<ul style="list-style-type: none"> • no more than one (may require permit from Archaeology Branch and Recreation Sites and Trails) • perpendicular to trail if practicable • minimize width as practicable • deactivate as soon as practicable
1.2 Negative impacts to tread surface	<ul style="list-style-type: none"> • none
1.3 Changes to trail location	<ul style="list-style-type: none"> • none
1.4 Alteration of adjacent vegetation	<ul style="list-style-type: none"> • none within 100 meters
Guidance- Moderate-high value trail	
2. Retain the moderate and high value recreation opportunities associated with Elk-Thurston Trail, Mount Cheam Trail Pierce Lake Trail and Vedder Mountain Trail taking into consideration the scenic and natural setting of the trail.	
Measure/Indicator	Targets/actions
2.1 Road crossings	<ul style="list-style-type: none"> • Minimized to no more than one permanent crossing for each 1 km section of trail. • Active temporary crossings permitted one per trail, removal prior to 6 months after planting • Limit access to trail by outdoor by recreational vehicles by use of barriers (boulders, trenches, coarse woody debris etc)
2.2 Negative Impacts to tread surface	<ul style="list-style-type: none"> • maintain and/or construct trail tread to provide continuous access to trail
2.3 Changes to trail location	<ul style="list-style-type: none"> • minimize to localized areas within trail right-of-way
2.4 Alteration of adjacent vegetation	<ul style="list-style-type: none"> • No more than 25% of trail right-of-way timber volume disturbed over free to grow period within the TLHB.
Guidance-moderate value trail	
3. Provide continued opportunity for a recreation experience utilising the trail known as Slesse Memorial Trail (trail portions outside heritage reserve).	
Measure/Indicator	Targets/actions
3.1 Road crossings	<ul style="list-style-type: none"> • minimize as practicable • perpendicular to trail where practicable • prevent access to trail by outdoor recreational vehicles
3.2 Negative Impacts to tread surface	<ul style="list-style-type: none"> • maintain and/or construct trail tread to provide continuous access to trail
3.3 Changes to trail location	<ul style="list-style-type: none"> • relocation of localized portions as necessary within trail right-of-way
3.4 Alteration of adjacent vegetation	<ul style="list-style-type: none"> • consider opportunities of retention adjacent to trail

Guidance- low-moderate value trail	
4. Provide continued opportunity for use of the recreation trail known as Williamson Lake Trail, Williams Peak Trail, Mount Rexford Trail, Mount McGuire Trail, Ling Lake Trail, Ford Mountain Trail Baby Munday Trail and Slesse Mountain Trail.	
Measure/Indicator	Targets/actions
4.1 Road crossings	<ul style="list-style-type: none"> • as required • prevent access to trail by outdoor recreational vehicles
4.2 Negative Impacts to tread surface	<ul style="list-style-type: none"> • maintain and/or construct trail tread to provide continuous access to trail
4.3 Changes to trail location	<ul style="list-style-type: none"> • localized
4.4 Alteration of adjacent vegetation	<ul style="list-style-type: none"> • consider opportunities of retention adjacent to trail
Guidance – low value trail	
5. Provide opportunity for a recreation trail in the proximity of Trans-Canada Trail.	
Measure/Indicator	Targets/actions
4.1 Road crossings	<ul style="list-style-type: none"> • as required • prevent access to trail by outdoor recreation vehicles
4.2 Negative Impacts to tread surface	<ul style="list-style-type: none"> • re-habilitate or relocate trail as necessary • clear debris to allow re-establishment by 3rd party
4.3 Changes to trail location	<ul style="list-style-type: none"> • as required
4.4 Alteration of adjacent vegetation	<ul style="list-style-type: none"> • as required

Under the *Forest and Range Practices Act (FRPA)* section 16 of the *Recreation Regulation BC Regulation 16/2004* requires all industrial activity to have authorization from the District Recreation Officer. This document is considered authorization required under section 16 of the recreation regulation for the trails listed in the Chilliwack District. If a forest activity requires a variance from any of these guidelines listed please contact the District Recreation Officer for authorization. Authorization for forest activities that operate outside of these guidelines will be considered and may be given in specific situations.



MEMORANDUM

Baby Munday Recreation Trail (REC106523) Legal Objectives (section 56, FRPA)

Under the authority of section 56 of the *Forest and Range Practices Act*, the following objectives are hereby established for this Recreation Trail.

The Management Intent statement describes the recreational values and use of the trail with the intention of focussing the individual who will be writing the results and strategies. The forest/range land manager is also guided by various supporting recreation management documents, including, among others, the *Recreation Features Handbook for BC, Appendix 2 - Recreation Trails - Best Management Practices for Forestry* (March 16, 2007).

The intent of the objectives is to give the individual additional guidance on how to manage for the recreation values of the trail. Objectives are written in the paradigm of addressing the tenure holder.

Management Intent

The Baby Munday Recreation Trail is being managed for a semi-primitive, non-roaded, non-motorized, hiking recreation experience. This popular trail begins within a second growth forest and continues up into the alpine, providing access to the central area of the Cheam Range.

Objectives

1. Maintain the unique recreation experience of hiking through a forested and sub-alpine setting;
2. Avoid building access structures unless no other practicable alternative exists; and
3. Maintain any new access structures in a manner that makes the best effort to prevent all motorized vehicles from accessing the trail.

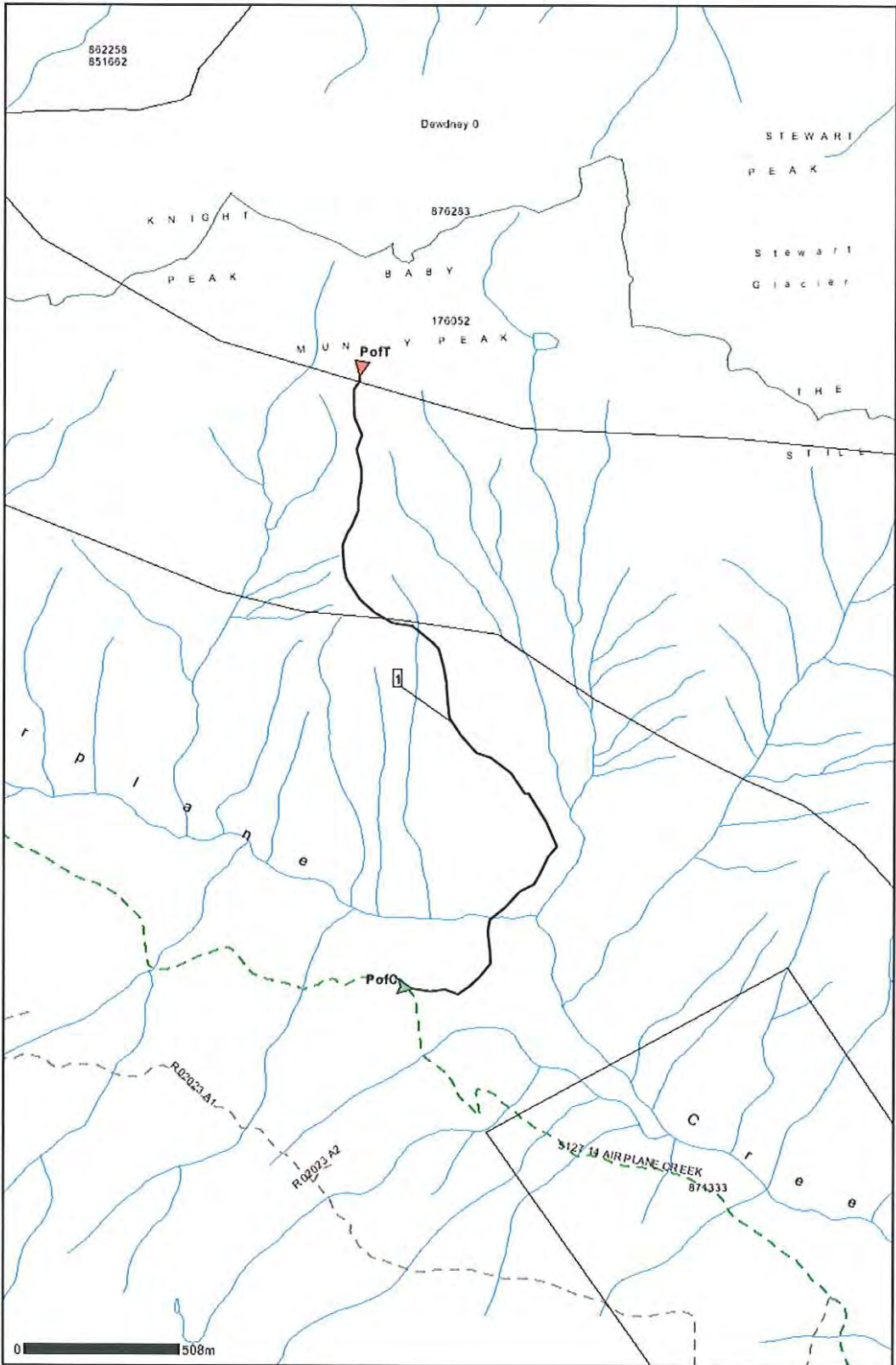
Paul Tataryn
Regional Manager
Coast Recreation Region

Effective date: October 10, 2012

File: 16660-20 REC106523 (Baby Munday Trail)
Attachment: Exhibit A dated January 18, 2010



MAP OF : REC106523 Baby Munday Trail (shown in bold black)			
FOREST REGION : RCO FOREST DISTRICT : DCK	TSA : 30 LAND DISTRICT : Chilliwack Forest District	PULPWOOD AGREEMENT :	MGT UNIT TYPE : MGT UNIT NO :
ESF SUBMISSION ID : 783084 BCGS MAPSHEET NO : 92H.012	SCALE : 1:20000 at A Size Length (Km) : 2.628	UTM : 10 NAD : NAD 83	DRAWN BY : FTA DATE : Jan 18, 2010



Legend	
	Tenure Application
	Tenure Road Application
	Retired Tenure Road
	P of C
	P of T
	Tenure Feature
	Range
	TFL
	Provincial Forest
	Forest Service Road
	Highway
	Municipal Road
	Non Status Road
	Recreation Trails
	Road Permit
	SUP Road
	Right of Way
	Schedule B CP Road
	Mineral Tenure Points
	Cities
	Waterbodies
	River/Stream
	Coastline / Island
1 (2.628 Km) PoFC UTM10 599898, 5444668 PoFT UTM10 599806, 5446645	



MEMORANDUM

Elk-Thurston Recreation Trail (REC0358) Legal Objectives (section 56, FRPA)

Under the authority of section 56 of the *Forest and Range Practices Act*, the following objectives are hereby established for this Recreation Trail.

The Management Intent statement describes the recreational values and use of the trail with the intention of focussing the individual who will be writing the results and strategies. The forest/range land manager is also guided by various supporting recreation management documents, including, among others, the *Recreation Features Handbook for BC, Appendix 2 - Recreation Trails - Best Management Practices for Forestry* (March 16, 2007).

The intent of the objectives is to give the individual additional guidance on how to manage for the recreation values of the trail. Objectives are written in the paradigm of addressing the tenure holder.

Management Intent

The Elk-Thurston Recreation Trail is being managed for a semi-primitive non-roaded, non-motorized, hiking recreation experience. The trail was originally a route used to access berry picking areas. This trail is the most popular trail in the upper Fraser Valley. It begins within a second growth forest and continues onto a ridge-walk through the sub-alpine leading to Elk Mountain, thence to Mount Thurston.

Objectives

1. Maintain the unique recreation experience of hiking through a forested and sub-alpine setting;
2. Avoid building access structures unless no other practicable alternative exists; and
3. Maintain any new access structures in a manner that makes the best effort to prevent all motorized vehicles from accessing the trail.

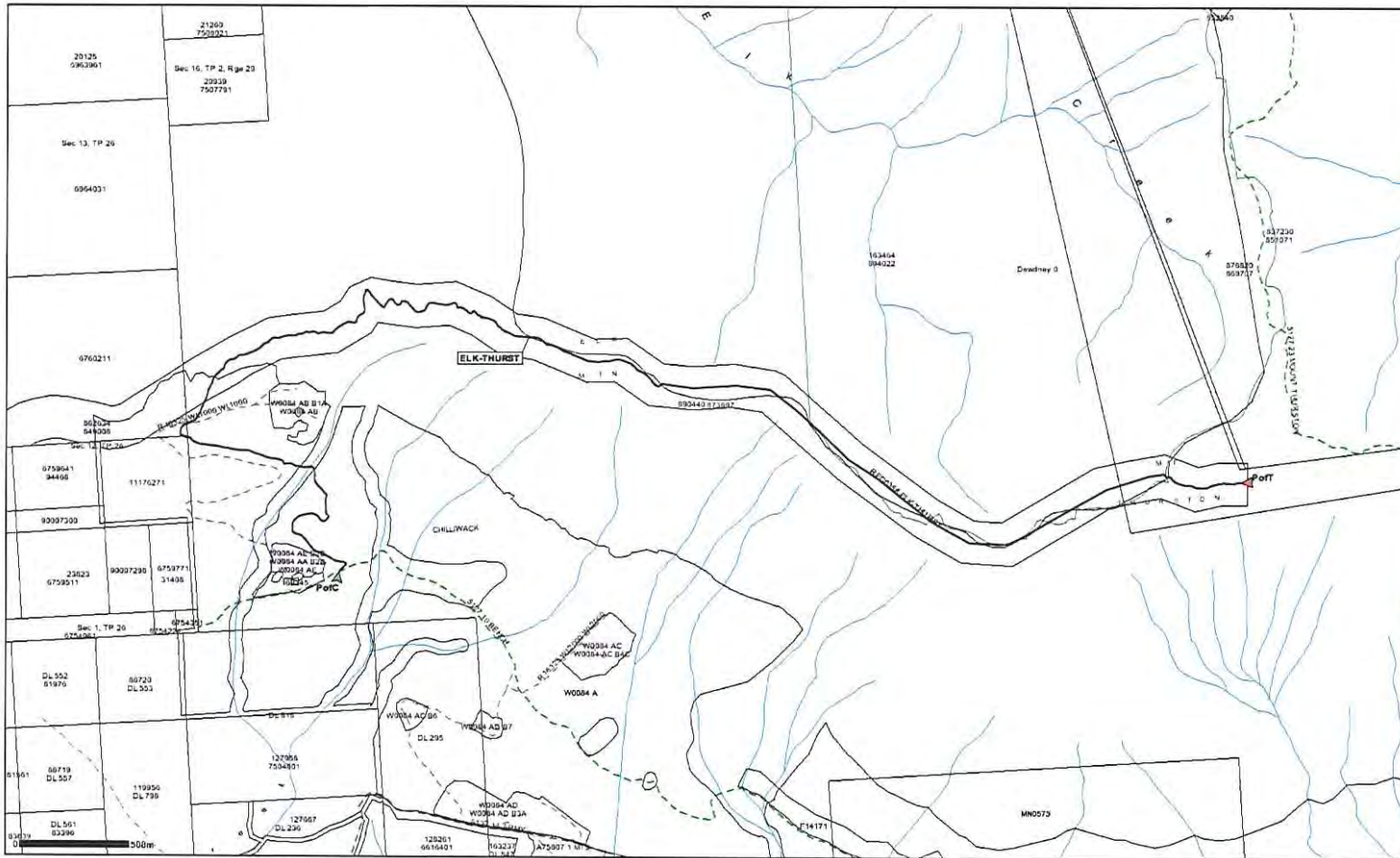
Paul Tataryn
Regional Manager
Coast Recreation Region

Effective date: Oct 10, 2012

File: 16660-20 REC0358 (Elk-Thurston)
Attachment: Exhibit A dated January 14, 2010



MAP OF : REC0358 Amendment # 1 Elk-Thurston Trail (shown in bold black)			
FOREST REGION : RCO FOREST DISTRICT : DCK	TSA : 30 LAND DISTRICT : Chilliwack Forest District	PULPWOOD AGREEMENT :	MGT UNIT TYPE : MGT UNIT NO :
ESF SUBMISSION ID : 782306 BCGS MAPSHEET NO : 92H.012	SCALE : 1:20000 at B Size Length (Km) : 7.516	UTM : 10 NAD : NAD 83	DRAWN BY : FTA DATE : Jan 14, 2010



Legend	
	Tenure Application
	Tenure Road Application
	Refined Tenure Road
	P of C
	P of T
	Tenure Feature
	Range
	TFL
	Provincial Forest
	Forest Service Road
	Highway
	Municipal Road
	Non Status Road
	Recreation Trails
	Road Permit
	SUP Road
	Right of Way
	Schedule B CP Road
	Mineral Tenure Points
	Cities
	Waterbodies
	River/Stream
	Coastline / Island
ELK-THURST (7.516 Km) PoIC UTM10 586079, 5438782 PoT UTM10 590272, 5440031	



MEMORANDUM

Ford Mountain Recreation Trail (REC3082) Legal Objectives (section 56, FRPA)

Under the authority of section 56 of the *Forest and Range Practices Act*, the following objectives are hereby established for this Recreation Trail.

The Management Intent statement describes the recreational values and use of the trail with the intention of focussing the individual who will be writing the results and strategies. The forest/range land manager is also guided by various supporting recreation management documents, including, among others, the *Recreation Features Handbook for BC, Appendix 2 - Recreation Trails - Best Management Practices for Forestry* (March 16, 2007).

The intent of the objectives is to give the individual additional guidance on how to manage for the recreation values of the trail. Objectives are written in the paradigm of addressing the tenure holder.

Management Intent

The Ford Mountain Recreation Trail is being managed for a semi-primitive non-roaded, non-motorized, hiking recreation experience. This popular trail begins within a second growth forest and continues up in elevation to Ford Mountain, the site of a long-since burned Forest Service Lookout tower.

Objectives

1. Maintain the unique recreation experience of hiking through a forested and sub-alpine setting;
2. Avoid building access structures unless no other practicable alternative exists; and
3. Maintain any new access structures in a manner that makes the best effort to prevent all motorized vehicles from accessing the trail.

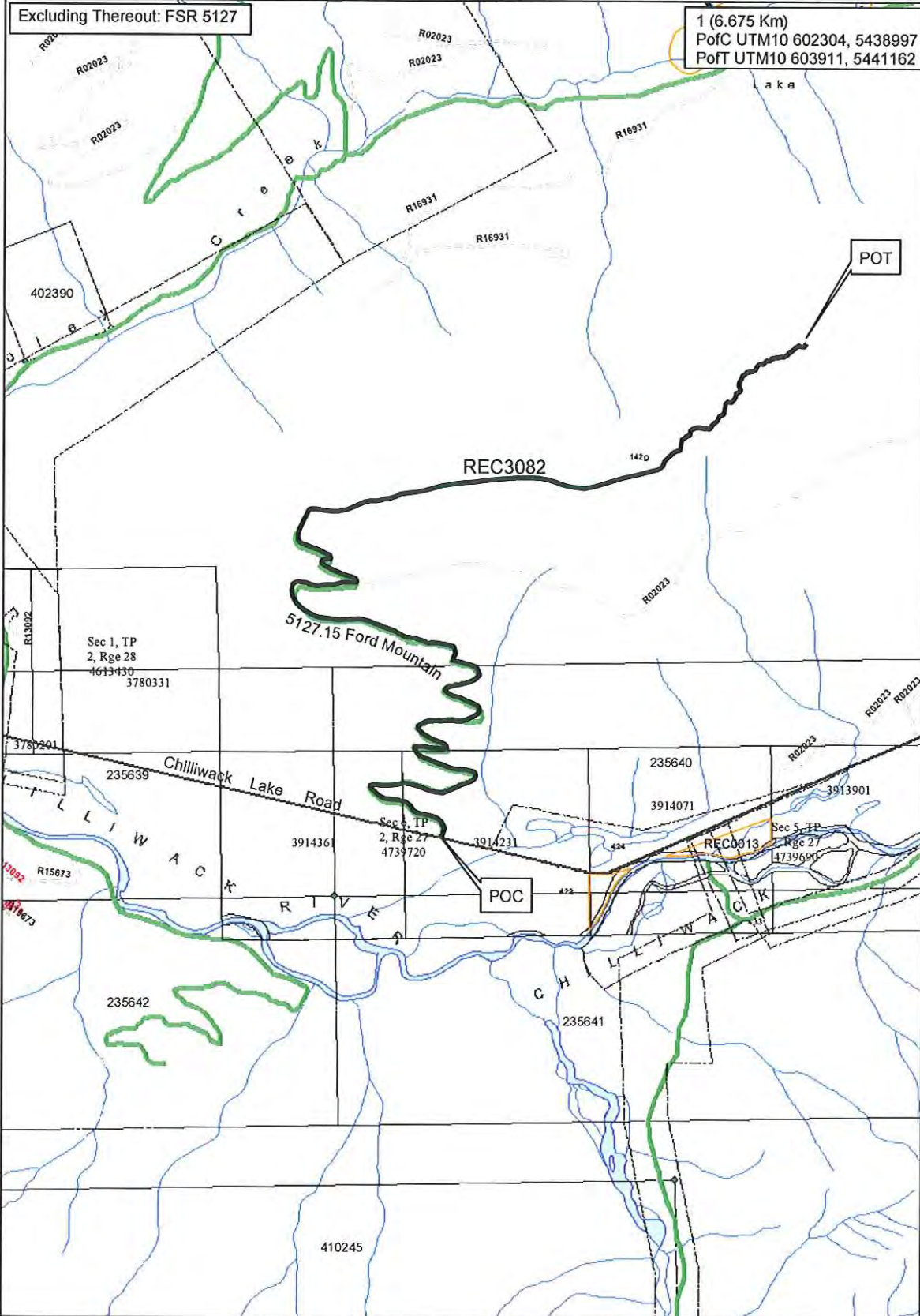
Paul Tataryn
Regional Manager
Coast Recreation Region

Effective date: Oct 10, 2012

File: 16660-20 REC3082 (Ford Mountain Trail)
Attachment: Exhibit A dated March 1, 2010

MAP OF : REC3082 Ford Mountain Trail (Shown in bold black)

FOREST REGION : RCO	TSA : 30 - Fraser	PULPWOOD AGREEMENT :	MGT UNIT TYPE: Timber Supply Area
FOREST DISTRICT: DCK	LAND DISTRICT : New Westminster		MGT UNIT NO : 30
ESF SUBMISSION ID : 791166	SCALE : 1:20,000 at A Size	UTM ZONE : 10	DRAWN BY: MDUNN
BCGS MAPSHEET NO : 92H.003	Length (Km): 6.675	NAD : 83	DATE : Mar. 1, 2010





MEMORANDUM

Ling Lake Recreation Trail (REC106525) Legal Objectives (section 56, FRPA)

Under the authority of section 56 of the *Forest and Range Practices Act*, the following objectives are hereby established for this Recreation Trail.

The Management Intent statement describes the recreational values and use of the trail with the intention of focussing the individual who will be writing the results and strategies. The forest/range land manager is also guided by various supporting recreation management documents, including, among others, the *Recreation Features Handbook for BC, Appendix 2 - Recreation Trails - Best Management Practices for Forestry* (March 16, 2007).

The intent of the objectives is to give the individual additional guidance on how to manage for the recreation values of the trail. Objectives are written in the paradigm of addressing the tenure holder.

Management Intent

The Ling Lake Recreation Trail is being managed for a semi-primitive, non-roaded, non-motorized, hiking recreation experience. This popular trail begins within a second growth forest and continues up in elevation to Ling Lake.

Objectives

1. Maintain the unique recreation experience of hiking through a forested and sub-alpine setting;
2. Avoid building access structures unless no other practicable alternative exists; and
3. Maintain any new access structures in a manner that makes the best effort to prevent all motorized vehicles from accessing the trail.

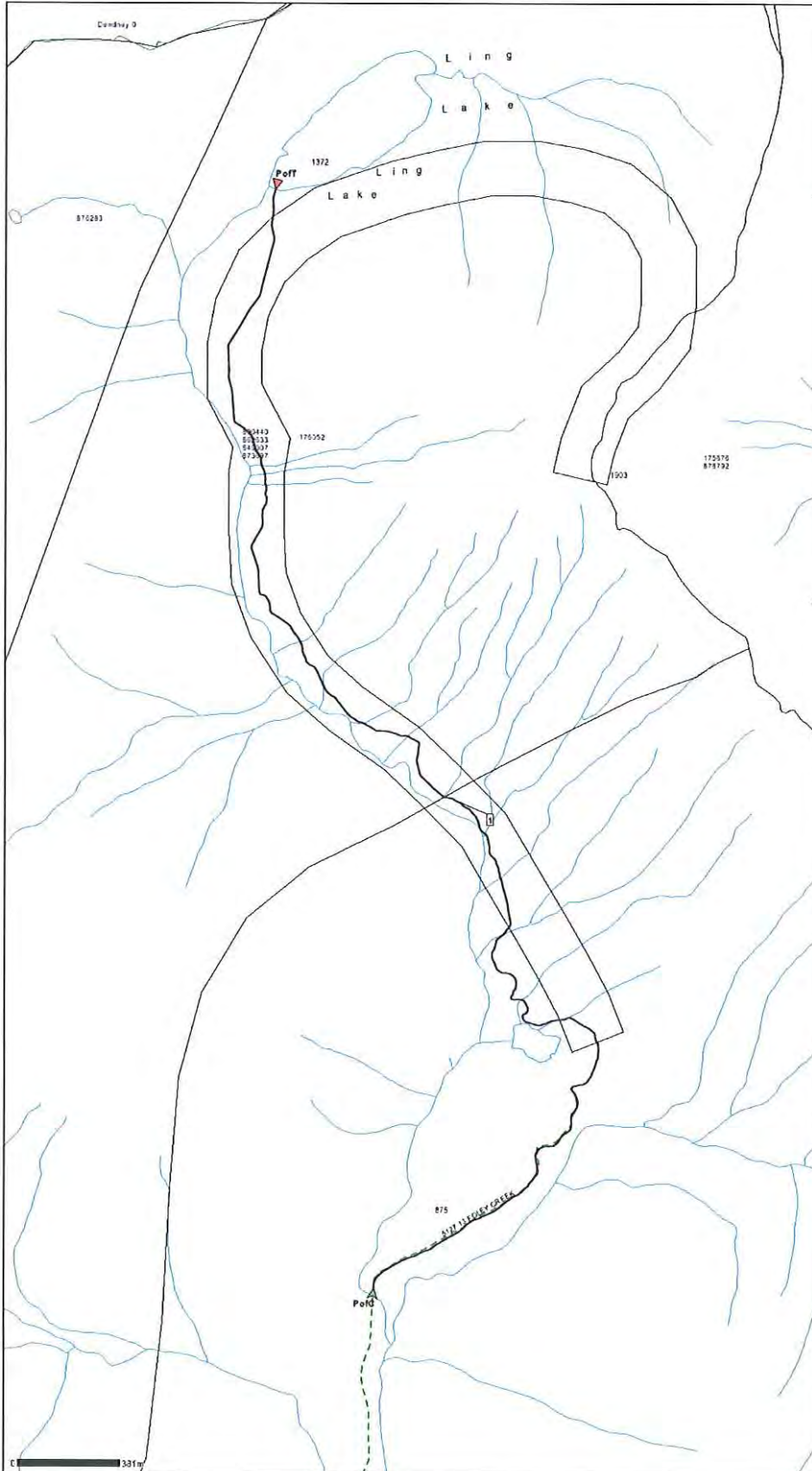
Paul Tataryn
Regional Manager
Coast Recreation Region

Effective date: Oct 10, 2012

File: 16660-20 REC106525 (Ling Lake Trail)
Attachment: Exhibit A dated February 16, 2010



MAP OF : REC106525 Ling Lake Trail (shown in bold black)			
FOREST REGION : RCO FOREST DISTRICT : DCK	TSA : LAND DISTRICT : Chilliwack Forest District	PULPWOOD AGREEMENT :	MGT UNIT TYPE : MGT UNIT NO :
ESF SUBMISSION ID : 783095 BCGS MAPSHEET NO : 92H.013	SCALE : 1:15000 at B Size Length (Km) : 5.437	UTM : 10 NAD : NAD83	DRAWN BY : FTA DATE : Feb 16, 2010



Legend

- Tenure Application
- Tenure Road Application
- Refined Tenure Road
- P of C
- P of T
- Tenure Feature
- Range
- TFL
- Provincial Forest
- Forest Service Road
- Highway
- Municipal Road
- Non Status Road
- Recreation Trails
- Road Permit
- SUP Road
- Right of Way
- Schedule B CP Road
- Mineral Tenure Points
- Cise
- Waterbodies
- River/Stream
- Coastline / Island

1 (5.437 Km)
 P of C UTM10 606739, 5446545
 P of T UTM10 606543, 5450550



MEMORANDUM

Mount Cheam Recreation Trail (REC106575) Legal Objectives (section 56, FRPA)

Under the authority of section 56 of the *Forest and Range Practises Act*, the following objectives are hereby established for this Recreation Trail.

The Management Intent statement describes the recreational values and use of the trail with the intention of focussing the individual who will be writing the results and strategies. The forest/range land manager is also guided by various supporting recreation management documents, including, among others, the *Recreation Features Handbook for BC, Appendix 2 - Recreation Trails - Best Management Practices for Forestry* (March 16, 2007).

The intent of the objectives is to give the individual additional guidance on how to manage for the recreation values of the trail. Objectives are written in the paradigm of addressing the tenure holder.

Management Intent

The Mount Cheam Recreation Trail is being managed for a semi-primitive non-roaded, non-motorized, hiking recreation experience. This heavily used, popular trail showcases coastal sub-alpine and alpine ecology and leads to the peak of Mount Cheam, from which there are spectacular views of the upper Fraser Valley.

Objectives

1. Maintain the unique recreation experience of hiking through a sub-alpine and alpine setting;
2. Avoid building access structures unless no other practicable alternative exists; and
3. Maintain any new access structures in a manner that makes the best effort to prevent all motorized vehicles from accessing the trail.

Paul Tataryn
Regional Manager
Coast Recreation Region

Effective date: Oct 10, 2012

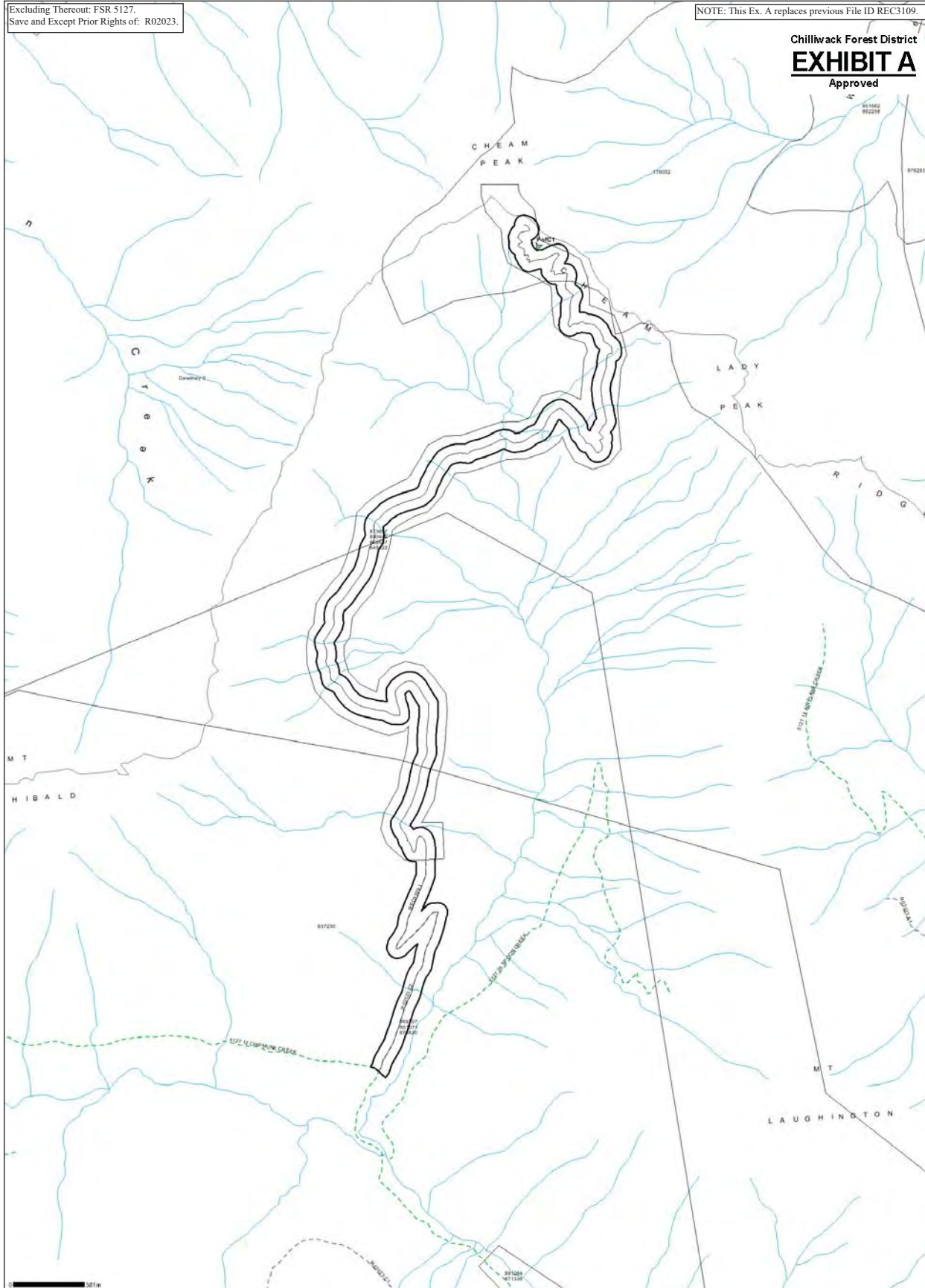
File: 16660-20 REC106575 (Mount Cheam)
Attachment: Exhibit A dated February 16, 2010



MAP OF : REC106575 Mount Cheam Trail (shown in bold black)			
FOREST REGION : RCO FOREST DISTRICT : DCK	TSA : 30 LAND DISTRICT : Chilliwack Forest District	PULPWOOD AGREEMENT :	MGT UNIT TYPE : MGT UNIT NO :
ESF SUBMISSION ID : 788077 BCGS MAPSHEET NO : 92H.012	SCALE : 1:15000 at C Size Area (Ha): 77.496	UTM : 10 NAD : NAD83	DRAWN BY : FTA DATE : Feb 16, 2010

Excluding Thereout: FSR 5127.
Save and Except Prior Rights of: R02023.

NOTE: This Ex. A replaces previous File ID REC3109.



Chilliwack Forest District
EXHIBIT A
Approved

Legend	
	Tenure Application
	Tenure Road Application
	Retired Tenure Road
	P of C
	Tenure Feature
	Range
	TFL
	Provincial Forest
	Forest Service Road
	Highway
	Municipal Road
	Non Status Road
	Recreation Trails
	Road Permit
	SUP Road
	Right of Way
	Schedule B CP Road
	Mineral Tenure Points
	Cities
	Waterbodies
	River/Stream
	Coastline / Island

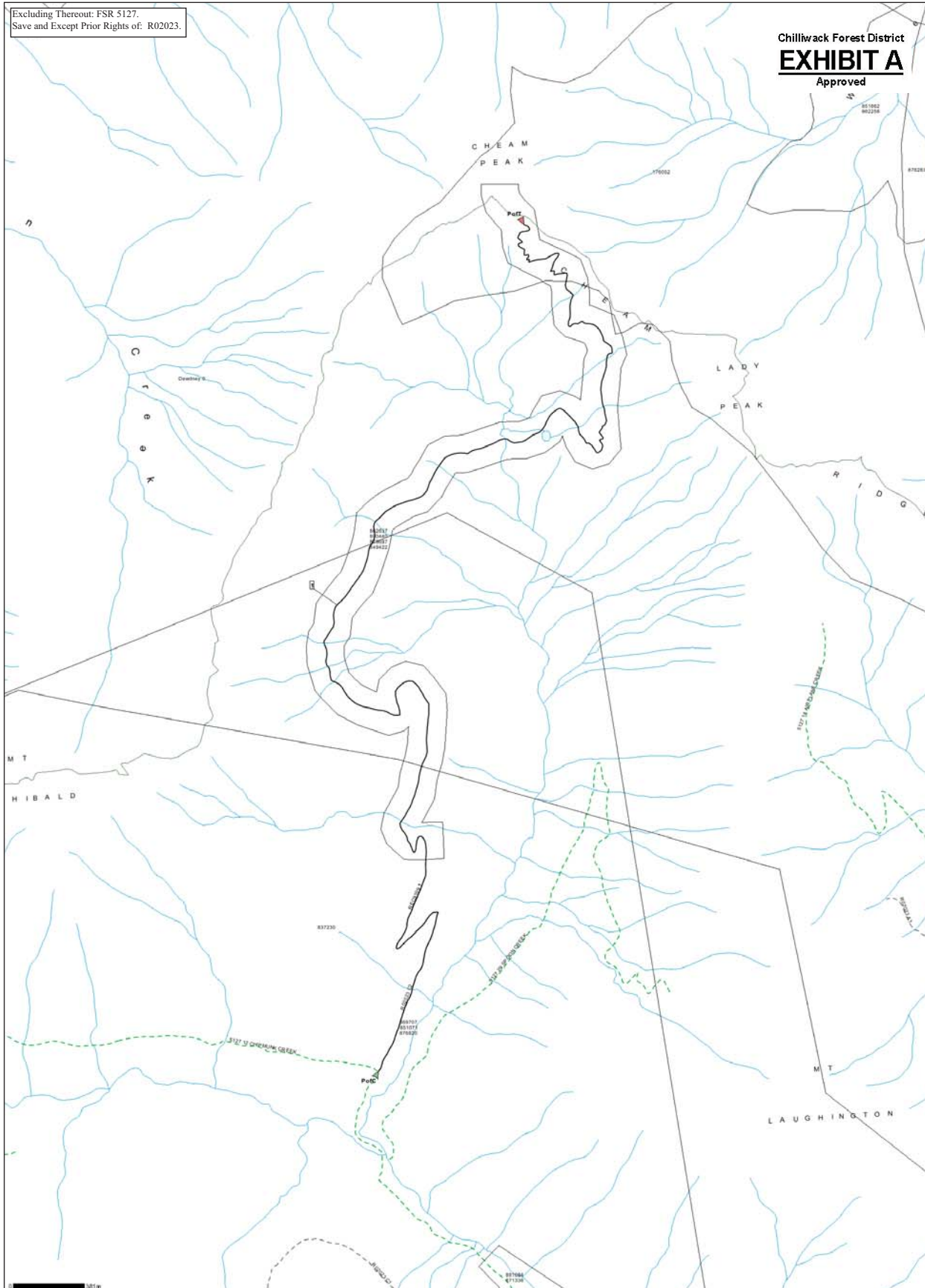
(77.496 Ha)
PoIC1 UTM10 596203, 5448641

Note: Trail Width R/W = 100 m. The trail area is described as 50 metres on either side of the centre of the defined, maintained trail tread as marked on the ground.

Refer to notes in REC3109 Mount Cheam Trail Exhibit A on next page.



MAP OF : REC3109 Mount Cheam Trail Amendment # 1 (shown in bold black)			
FOREST REGION : RSI FOREST DISTRICT : DCS	TSA : LAND DISTRICT :	PULPWOOD AGREEMENT :	MGT UNIT TYPE : MGT UNIT NO :
ESF SUBMISSION ID : 160855 BCGS MAPSHEET NO : 92H.012	SCALE : 1:15000 at C Size Length (Km): 8.1218	UTM : 10 NAD : NAD83	RE-DRAWN BY : FTA DATE : Dec 30, 2009



Legend	
	Tenure Application
	Tenure Road Application
	Retired Tenure Road
	P of C
	P of T
	Tenure Feature
	Range
	TFL
	Provincial Forest
	Forest Service Road
	Highway
	Municipal Road
	Non Status Road
	Recreation Trails
	Road Permit
	SUP Road
	Right of Way
	Schedule B CP Road
	Mineral Tenure Points
	Cities
	Waterbodies
	River/Stream
	Coastline / Island

1 (8.1218 Km)
 PoFC UTM10 596203,5448641
 PoFT UTM10 596142, 5448781

Note: Trail Width R/W = 100 m. The trail area is described as 50 metres on either side of the centre of the defined, maintained trail tread as marked on the ground.

Note: REC3109 Mount Cheam Trail Exhibit A dated December 30, 2009, supersedes REC106575 dated February 16, 2010. REC3109 trail is currently being approved for establishment as of October 25, 2012 and will replace the Memorandum document. The Legal Objectives will remain the same.



MEMORANDUM

Mount McGuire Recreation Trail (REC3081) Legal Objectives (section 56, FRPA)

Under the authority of section 56 of the *Forest and Range Practices Act*, the following objectives are hereby established for this Recreation Trail.

The Management Intent statement describes the recreational values and use of the trail with the intention of focussing the individual who will be writing the results and strategies. The forest/range land manager is also guided by various supporting recreation management documents, including, among others, the *Recreation Features Handbook for BC, Appendix 2 - Recreation Trails - Best Management Practices for Forestry* (March 16, 2007).

The intent of the objectives is to give the individual additional guidance on how to manage for the recreation values of the trail. Objectives are written in the paradigm of addressing the tenure holder.

Management Intent

The Mount McGuire Recreation Trail is being managed for a semi-primitive non-roaded, non-motorized, hiking and caving recreation experience. This popular trail begins within a second growth forest and continues up in elevation to the alpine. This area, being limestone, contains many significant caves.

Objectives

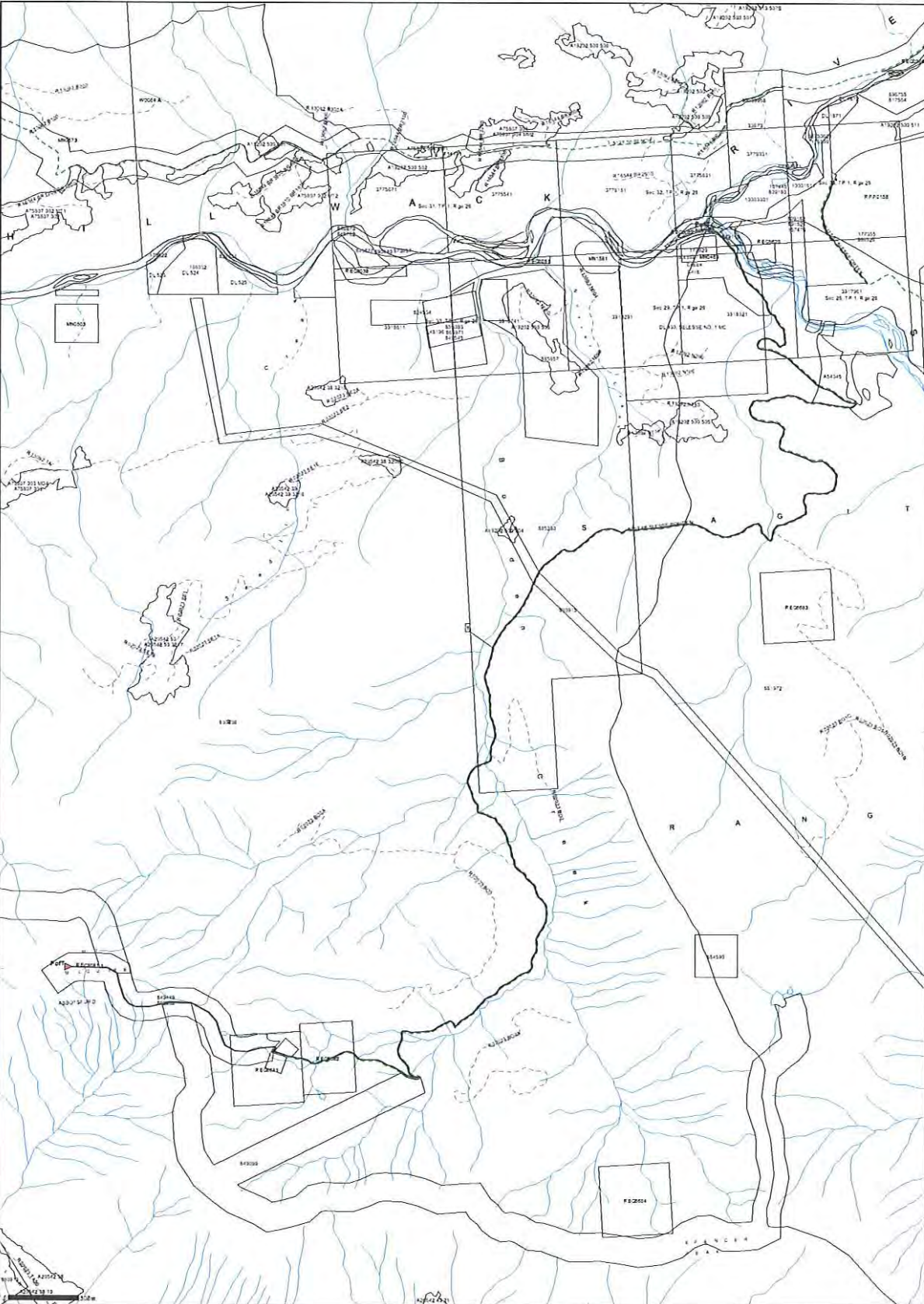
1. Maintain the unique recreation experience of hiking through a forested and sub-alpine setting;
2. Avoid building access structures unless no other practicable alternative exists; and
3. Maintain any new access structures in a manner that makes the best effort to prevent all motorized vehicles from accessing the trail.

Paul Tataryn
Regional Manager
Coast Recreation Region

Effective date: Oct 10, 2012

File: 16660-20 REC3081 (Mount McGuire Trail)
Attachment: Exhibit A dated January 18, 2010

MAP OF : REC3081 Mount McGuire Trail Amendment # 3 (shown in bold black)			
FOREST REGION : RCO FOREST DISTRICT : DCK	TSA : 30 LAND DISTRICT : Chilliwack Forest District	PULPWOOD AGREEMENT :	MGT UNIT TYPE : MGT UNIT NO :
ESF SUBMISSION ID : 782874 BCGS MAPSHEET NO : 92H.002	SCALE : 1:20000 at C Size Length (Km): 14.2	UTM : 10 NAD : NAD 83	DRAWN BY : FTA DATE : Jan 18, 2010



Legend	
	Tenure Application
	Tenure Road Application
	Relined Tenure Road
	P of C
	P of T
	Tenure Features
	Range
	TFL
	Provincial Forest
	Forest Service Road
	Highway
	Municipal Road
	Non Status Road
	Recreation Trails
	Road Permit
	SLIP Road
	Right of Way
	Schedule B CP Road
	Mineral Tenure Points
	Cleek
	Waterbody
	River/Stream
	Coastline / Island
1 (14.2 Km)	
Po/C UTM10 594315, 5436893	
Po/T UTM10 589541, 5431908	



MEMORANDUM

Mount Rexford Recreation Trail (REC6877) Legal Objectives (section 56, FRPA)

Under the authority of section 56 of the *Forest and Range Practices Act*, the following objectives are hereby established for this Recreation Trail.

The Management Intent statement describes the recreational values and use of the trail with the intention of focussing the individual who will be writing the results and strategies. The forest/range land manager is also guided by various supporting recreation management documents, including, among others, the *Recreation Features Handbook for BC, Appendix 2 - Recreation Trails - Best Management Practices for Forestry* (March 16, 2007).

The intent of the objectives is to give the individual additional guidance on how to manage for the recreation values of the trail. Objectives are written in the paradigm of addressing the tenure holder.

Management Intent

The Mount Rexford Recreation Trail is being managed for a semi-primitive, non-roaded, non-motorized, hiking recreation experience. This popular trail begins within a second growth forest and continues up in elevation to Mount Rexford. The trail also provides access to the Illusion Peaks.

Objectives

1. Maintain the unique recreation experience of hiking through a forested and sub-alpine setting;
2. Avoid building access structures unless no other practicable alternative exists; and
3. Maintain any new access structures in a manner that makes the best effort to prevent all motorized vehicles from accessing the trail.

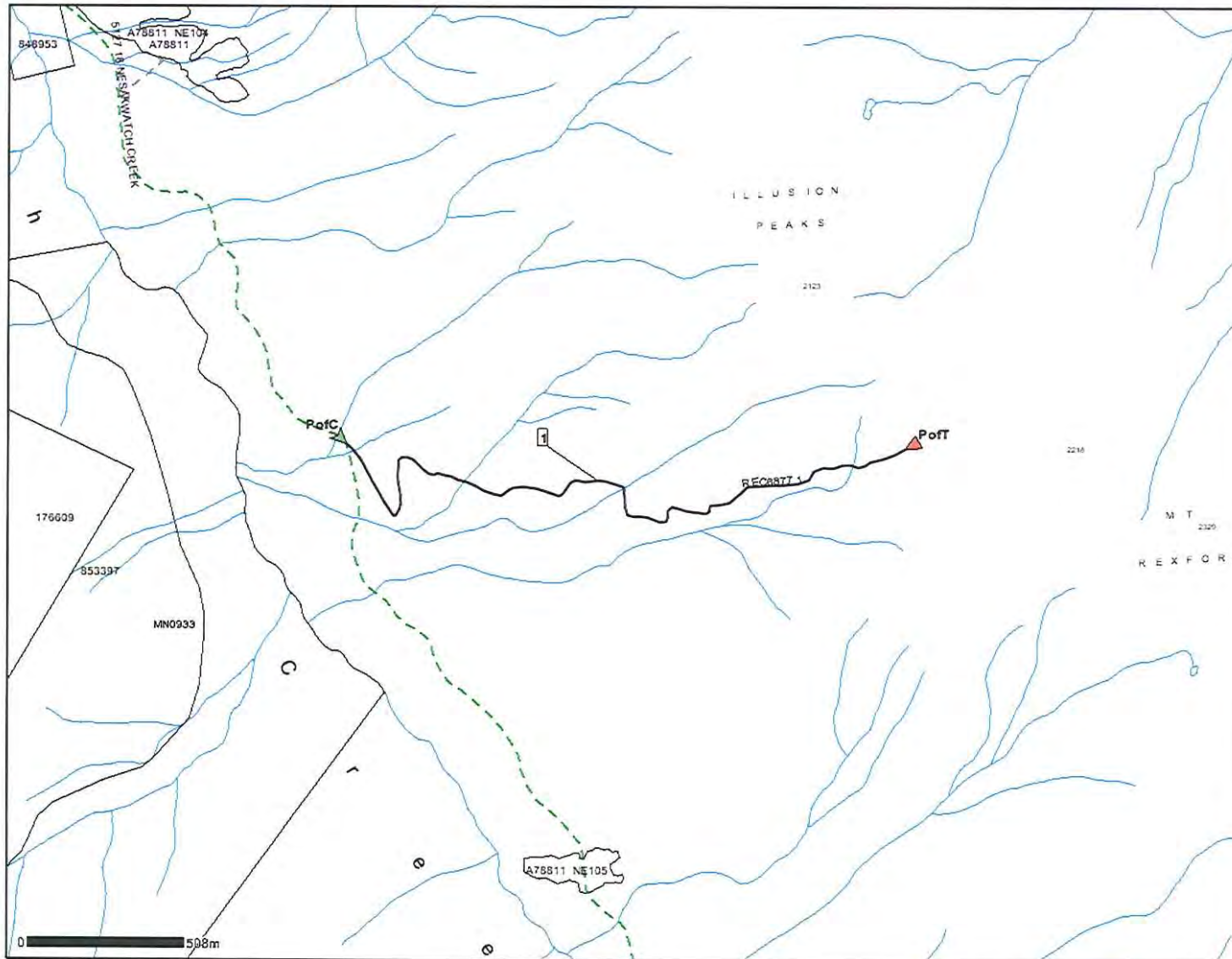
Paul Tataryn
Regional Manager
Coast Recreation Region



















Effective date: Oct 10 2012

File: 16660-20 REC6877 (Mount Rexford Trail)
Attachment: Exhibit A dated January 18, 2010



MAP OF : REC6877 Mount Rexford Amendment # 2 (shown in bold black)			
FOREST REGION : RCO FOREST DISTRICT : DCK	TSA : 30 LAND DISTRICT : Chilliwack Forest District	PULPWOOD AGREEMENT :	MGT UNIT TYPE : MGT UNIT NO :
ESF SUBMISSION ID : 783017 BCGS MAPSHEET NO : 92H.003	SCALE : 1:20000 at A Size Length (Km): 2.387	UTM : 10 NAD : NAD 83	DRAWN BY : FTA DATE : Jan 18, 2010



Legend	
	Tenure Application
	Tenure Road Application
	Retired Tenure Road
	P of C
	P of T
	Tenure Feature
	Range
	TFL
	Provincial Forest
	Forest Service Road
	Highway
	Municipal Road
	Non Status Road
	Recreation Trails
	Road Permit
	SUP Road
	Right of Way
	Schedule B CP Road
	Mineral Tenure Points
	Cities
	Waterbodies
	River/Stream
	Coastline / Island
1 (2.387 Km) PofC UTM10 605187, 5432619 PofT UTM10 606985, 5432529	



MEMORANDUM

Pierce Lake Recreation Trail (REC0342) Legal Objectives (section 56, FRPA)

Under the authority of section 56 of the *Forest and Range Practices Act*, the following objectives are hereby established for this Recreation Trail.

The Management Intent statement describes the recreational values and use of the trail with the intention of focussing the individual who will be writing the results and strategies. The forest/range land manager is also guided by various supporting recreation management documents, including, among others, the *Recreation Features Handbook for BC, Appendix 2 - Recreation Trails - Best Management Practices for Forestry* (March 16, 2007).

The intent of the objectives is to give the individual additional guidance on how to manage for the recreation values of the trail. Objectives are written in the paradigm of addressing the tenure holder.

Management Intent

The Pierce Lake Recreation Trail is being managed for a semi-primitive non-roaded, non-motorized, hiking recreation experience. This popular trail begins within a second growth forest as it continues on to the lower and upper Pierce Lakes and thereafter to the summit of Mount MacFarlane.

Objectives

1. Maintain the unique recreation experience of hiking through a forested and subalpine setting;
2. Avoid building access structures unless no other practicable alternative exists; and
3. Maintain any new access structures in a manner that makes the best effort to prevent all motorized vehicles from accessing the trail.

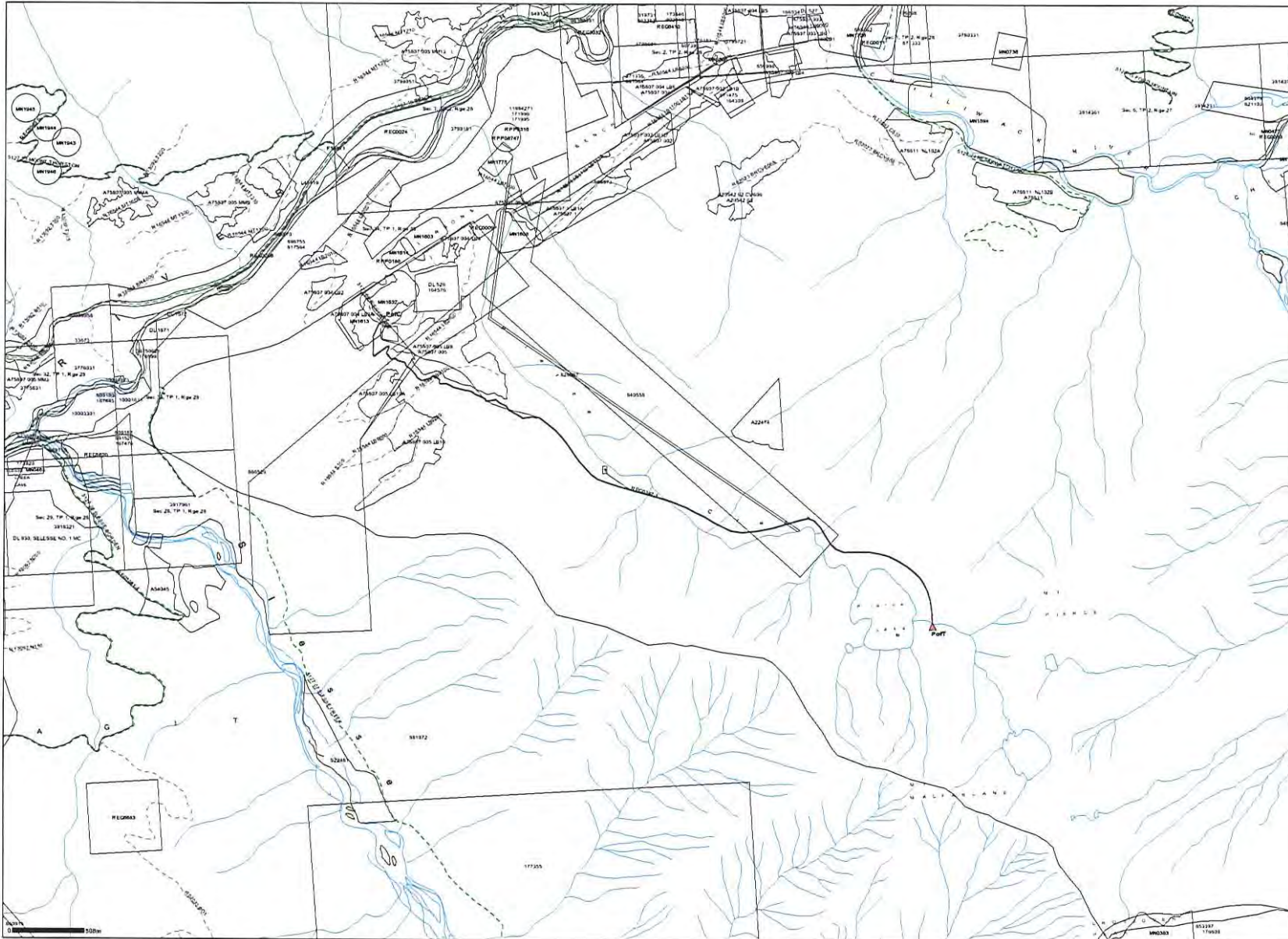
Paul Tataryn
Regional Manager
Coast Recreation Region

Effective date: Oct 10, 2012

File: 16660-20 REC0342 (Pierce Lake Trail)
Attachment: Exhibit A dated October 19, 2010



MAP OF : REC0342 Pierce Lake Trail Amendment # 2 (shown in bold black)			
FOREST REGION : RCO FOREST DISTRICT : DCK	TSA : LAND DISTRICT : Chilliwack Forest District	PULPWOOD AGREEMENT :	MGT UNIT TYPE : MGT UNIT NO :
ESF SUBMISSION ID : 841457 BCGS MAPSHEET NO : 92H.002	SCALE : 1:20000 at C Size Length (Km): 5.198	UTM : 10 NAD : NAD83	DRAWN BY : FTA DATE : Oct 19, 2010



Legend	
	Tenure Application
	Tenure Road Application
	Retired Tenure Road
	P of C
	P of T
	Tenure Feature Range
	TPL
	Provincial Forest
	Forest Service Road
	Highway
	Municipal Road
	Non Status Road
	Recreation Trails
	Road Permit
	SLIP Road
	Right of Way
	Schedule B CF Road
	Mineral Tenure Points
	CDes
	Waterbody
	River/Stream
	Coastline / Island

1 (5.198 Km)
 PofC UTM10 596725, 5437673
 PofT UTM10 600496, 5435390



MEMORANDUM

Slesse Memorial Recreation Trail (REC106514) Legal Objectives (section 56, FRPA)

Under the authority of section 56 of the *Forest and Range Practices Act*, the following objectives are hereby established for this Recreation Trail.

The Management Intent statement describes the recreational values and use of the trail with the intention of focussing the individual who will be writing the results and strategies. The forest/range land manager is also guided by various supporting recreation management documents, including, among others, the *Recreation Features Handbook for BC, Appendix 2 - Recreation Trails - Best Management Practices for Forestry* (March 16, 2007).

The intent of the objectives is to give the individual additional guidance on how to manage for the recreation values of the trail. Objectives are written in the paradigm of addressing the tenure holder.

Management Intent

The Slesse Memorial Recreation Trail is being managed for a semi-primitive non-roaded, non-motorized, hiking recreation experience. Two routes are used to access the sub-alpine and a memorial for a 1956 plane crash. It also accesses one of the '50 Classic Climbs of North America'. The trail begins within a second growth forest and continues up to the sub-alpine on Slesse Peak.

Objectives

1. Maintain the unique recreation experience of hiking through a forested and sub-alpine setting;
2. Avoid building access structures unless no other practicable alternative exists; and
3. Maintain any new access structures in a manner that makes the best effort to prevent all motorized vehicles from accessing the trail.

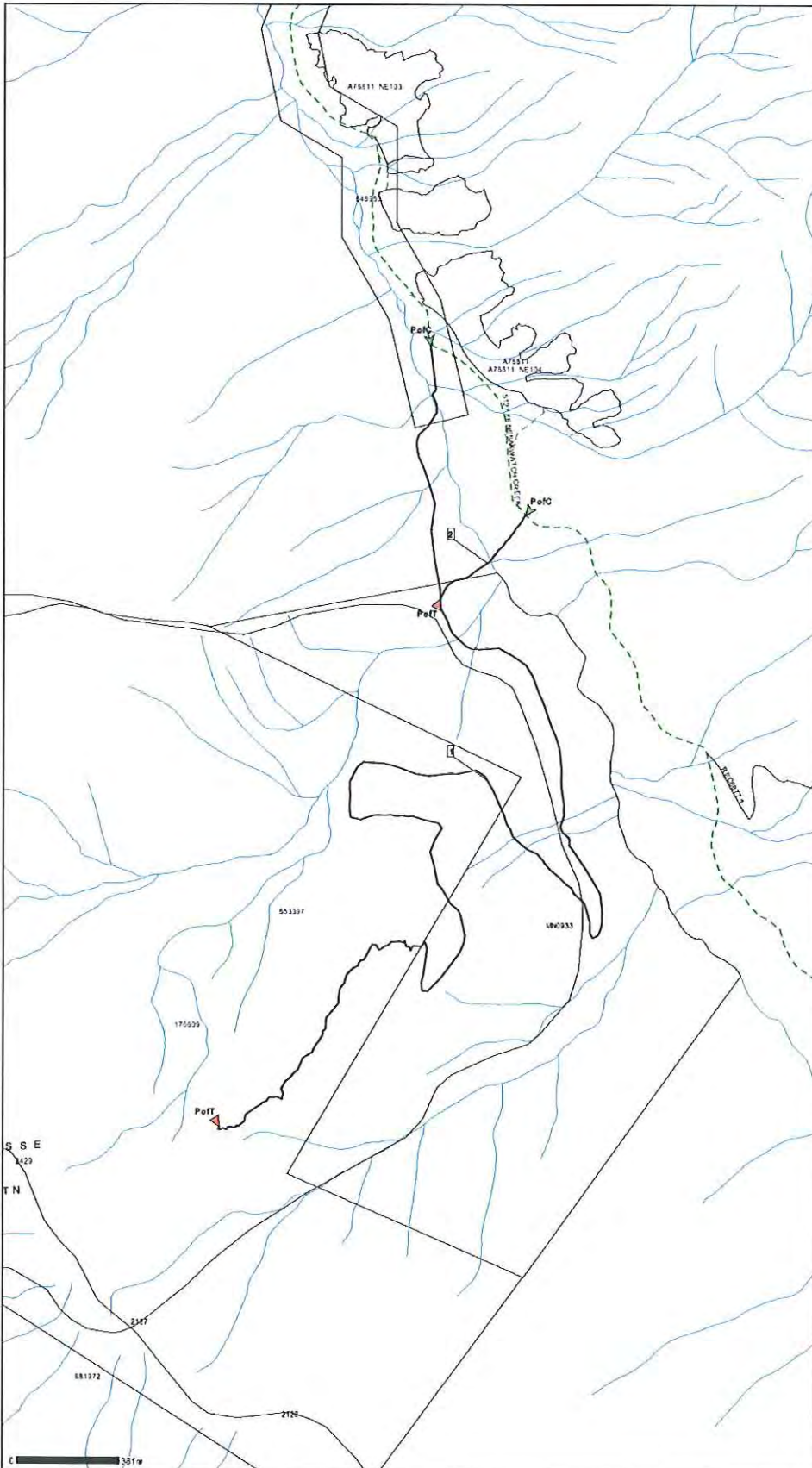
Paul Tataryn
Regional Manager
Coast Recreation Region

Effective date: Oct 10, 2012

File: 16660-20 REC106514 (Slesse Memorial Trail)
Attachment: Exhibit A dated February 16, 2010



MAP OF : REC106514 Sleese Memorial Trail (shown in bold black)			
FOREST REGION : RCO	TSA :	PULPWOOD AGREEMENT :	MGT UNIT TYPE :
FOREST DISTRICT : DCK	LAND DISTRICT : Chilliwack Forest District		MGT UNIT NO. :
ESF SUBMISSION ID : 782603	SCALE : 1:15000 at B Size	UTM : 10	DRAWN BY : FTA
BCGS MAPSHEET NO : 92H.003	Length (Km): 6.907	NAD : NAD83	DATE : Feb 16, 2010



Legend	
	Tenure Application
	Tenure Road Application
	Retired Tenure Road
	P of C
	P of T
	Tenure Feature
	Range
	TFL
	Provincial Forest
	Forest Service Road
	Highway
	Municipal Road
	Non Status Road
	Recreation Trails
	Road Permit
	SUP Road
	Right of Way
	Surrender B CP Road
	Mineral Tenure Points
	Clips
	Waterbodies
	River/Stream
	Coastline / Island
1 (6.456 Km) PoFC UTM10 604230, 5434146 PoFT UTM10 603338, 5431334 2 (0.451 Km) PoFC UTM10 604552, 5433515 PoFT UTM10 604227, 5433224	



MEMORANDUM

Slesse Mountain Recreation Trail (REC106768) Legal Objectives (section 56, FRPA)

Under the authority of section 56 of the *Forest and Range Practices Act*, the following objectives are hereby established for this Recreation Trail.

The Management Intent statement describes the recreational values and use of the trail with the intention of focussing the individual who will be writing the results and strategies. The forest/range land manager is also guided by various supporting recreation management documents, including, among others, the *Recreation Features Handbook for BC, Appendix 2 - Recreation Trails - Best Management Practices for Forestry* (March 16, 2007).

The intent of the objectives is to give the individual additional guidance on how to manage for the recreation values of the trail. Objectives are written in the paradigm of addressing the tenure holder.

Management Intent

The Slesse Mountain Trail is being managed for a semi-primitive non-motorized, non-roaded, hiking experience. This popular trail provide mountain climbers access to a well-know mountain climbing area.

Objectives

1. Maintain the unique recreation experience of hiking through a forested and sub-alpine setting;
2. Avoid building access structures unless no other practicable alternative exists; and
3. Maintain any new access structures in a manner that makes the best effort to prevent all motorized vehicles from accessing the trail.

Paul Tataryn
Regional Manager
Coast Recreation Region

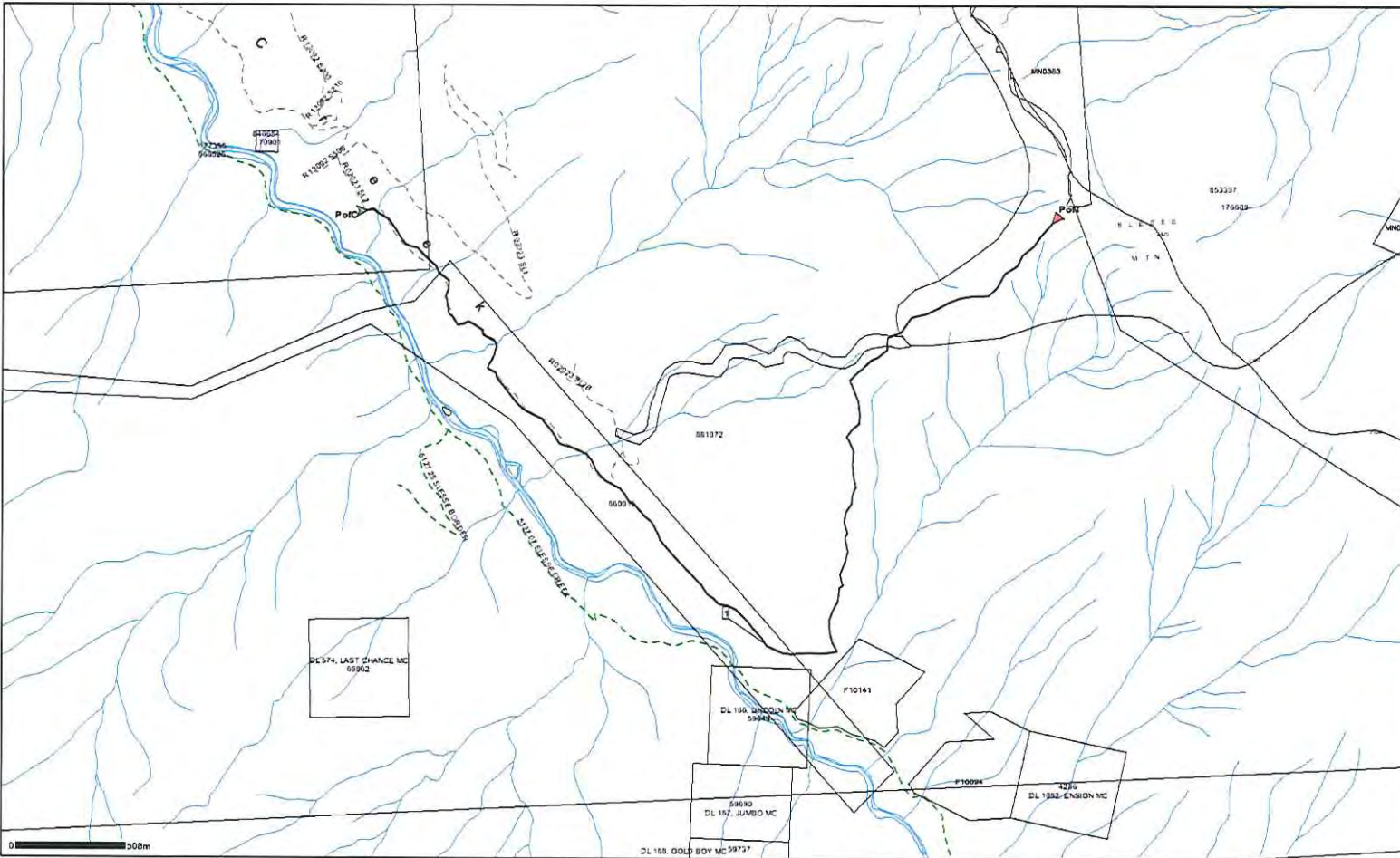
Effective date: Oct 19, 2012

File: 16660-20 REC106768 (Slesse Mountain Trail)
Attachment: Exhibit A dated February 17, 2010



MAP OF : REC106768 Slesse Mountain Trail (shown in bold black)

FOREST REGION : RCO FOREST DISTRICT : DCK	TSA : LAND DISTRICT : Chilliwack Forest District	PULPWOOD AGREEMENT :	MGT UNIT TYPE : MGT UNIT NO :
ESF SUBMISSION ID : 794745 BCGS MAPSHEET NO : 92H.002	SCALE : 1:20000 at B Size Length (Km): 5.943	UTM : 10 NAD : NAD83	DRAWN BY : FTA DATE : Feb 17, 2010



Legend

-  Tenure Application
-  Tenure Road Application
-  Redlined Tenure Road
-  P of C
-  P of T
-  Tenure Feature
-  Range
-  TFL
-  Provincial Forest
-  Forest Service Road
-  Highway
-  Municipal Road
-  Non Status Road
-  Recreation Trails
-  Road Permit
-  SUP Road
-  Right of Way
-  Schedule B CP Road
-  Mineral Tenure Points
-  Cities
-  Waterbodies
-  River/Stream
-  Coastline / Island

1 (5.943 Km)
PoC UTM10 598951, 5431497
PoT UTM10 602103, 5431306



MEMORANDUM

Vedder Mountain Recreation Trail (REC0350) Legal Objectives (section 56, FRPA)

Under the authority of section 56 of the *Forest and Range Practices Act*, the following objectives are hereby established for this Recreation Trail.

The Management Intent statement describes the recreational values and use of the trail with the intention of focussing the individual who will be writing the results and strategies. The forest/range land manager is also guided by various supporting recreation management documents, including, among others, the *Recreation Features Handbook for BC, Appendix 2 - Recreation Trails - Best Management Practices for Forestry* (March 16, 2007).

The intent of the objectives is to give the individual additional guidance on how to manage for the recreation values of the trail. Objectives are written in the paradigm of addressing the tenure holder.

Management Intent

The Vedder Mountain Recreation Trail is being managed as part of a semi-primitive, multiple use recreation trail network. There will be segregated motorized and non-motorized trails within the overall trail area. This area is heavily used by hikers, mountain bikers, equestrians, ATV users and motorized bikers. The trail is a non-motorized hiking trail along Vedder Ridge.

Objectives

1. Maintain the unique recreation experience of trail riding and hiking through a forested setting;
2. Avoid building access structures onto critical non-motorized trails unless no other practicable alternative exists; and
3. Maintain any new access structures in a manner that makes the best effort to prevent all motorized vehicles from accessing the trail.

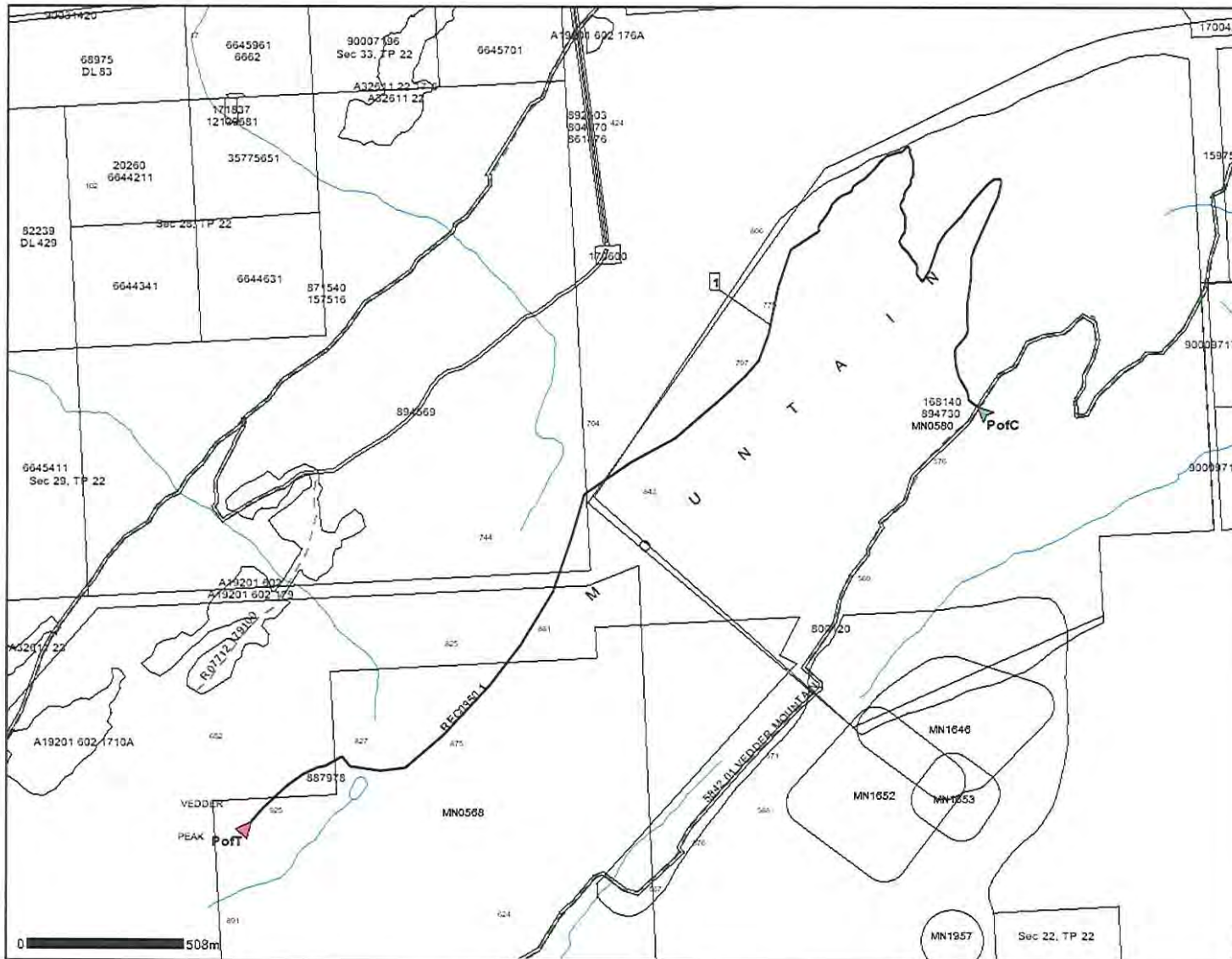
Paul Tataryn
Regional Manager
Coast Recreation Region

Effective date: Oct 10, 2012

File: 16660-20 REC0350 (Vedder Mountain Trail)
Attachment: Exhibit A dated November 4, 2011



MAP OF : REC0350 Vedder Mountain Trail Amendment # 3 (shown in bold black)			
FOREST REGION : RCO FOREST DISTRICT : DCK	TSA : 30 LAND DISTRICT : Chilliwack Forest District	PULPWOOD AGREEMENT :	MGT UNIT TYPE : MGT UNIT NO :
ESF SUBMISSION ID : 783041 BCGS MAPSHEET NO : 92G.010	SCALE : 1:20000 at A Size Length (Km) : 5.023	UTM : 10 NAD : NAD 83	DRAWN BY : FTA DATE : Jan 18, 2010



Legend	
	Tenure Application
	Tenure Road Application
	Retired Tenure Road
	P of C
	P of T
	Tenure Feature
	Range
	TFL
	Provincial Forest
	Forest Service Road
	Highway
	Municipal Road
	Non Status Road
	Recreation Trails
	Road Permit
	SUP Road
	Right of Way
	Schedule B CF Road
	Mineral Tenure Points
	Cities
	Waterbodies
	River/Stream
	Coastline / Island

1 (5.023 Km)
 PoC UTM10 572214, 5435087
 PoT UTM10 569822, 5433828



MEMORANDUM

Williams Peak Recreation Trail (REC0362) Legal Objectives (section 56, FRPA)

Under the authority of section 56 of the *Forest and Range Practices Act*, the following objectives are hereby established for this Recreation Trail.

The Management Intent statement describes the recreational values and use of the trail with the intention of focussing the individual who will be writing the results and strategies. The forest/range land manager is also guided by various supporting recreation management documents, including, among others, the *Recreation Features Handbook for BC, Appendix 2 - Recreation Trails - Best Management Practices for Forestry* (March 16, 2007).

The intent of the objectives is to give the individual additional guidance on how to manage for the recreation values of the trail. Objectives are written in the paradigm of addressing the tenure holder.

Management Intent

The Williams Peak Recreation Trail is being managed for a semi-primitive, non-roaded, non-motorized, hiking recreation experience. This popular trail begins within a second growth forest and continues up in elevation to Williams Ridge where climbers can continue to the summit..

Objectives

1. Maintain the unique recreation experience of hiking through a forested and sub-alpine setting;
2. Avoid building access structures unless no other practicable alternative exists; and
3. Maintain any new access structures in a manner that makes the best effort to prevent all motorized vehicles from accessing the trail.

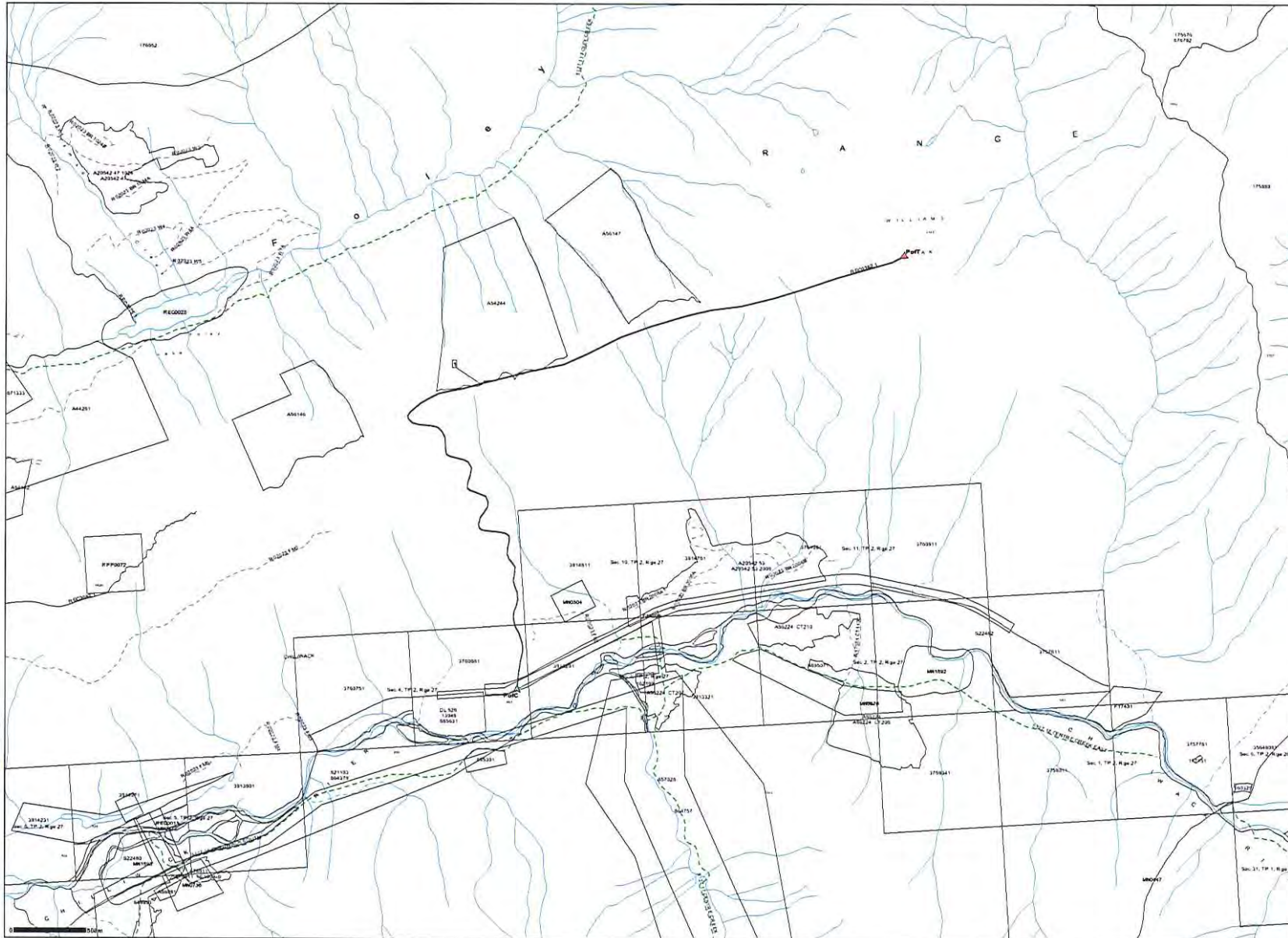
Paul Tataryn
Regional Manager
Coast Recreation Region

Effective date: Oct 10, 2012

File: 16660-20 REC0362 (Williams Peak Trail)
Attachment: Exhibit A dated February 22, 2010



MAP OF : REC0362 Williams Peak Trail Amendment # 3 (shown in bold black)			
FOREST REGION : RCO FOREST DISTRICT : DCK	TSA : LAND DISTRICT : Chilliwack Forest District	PULPWOOD AGREEMENT :	MGT UNIT TYPE : MGT UNIT NO :
ESF SUBMISSION ID : 782892 BCGS MAPSHEET NO : 92H.013	SCALE : 1:20000 at C Size Length (Km): 6.177	UTM : 10 NAD : NAD83	DRAWN BY : FTA DATE : Feb 22, 2010



Legend	
	Tenure Application
	Tenure Road Application
	Rational Tenure Road
	P of C
	P of T
	Tenure Feature
	Range
	TFL
	Provincial Forest
	Forest Service Road
	Highway
	Municipal Road
	Non Status Road
	Recreation Trails
	Road Permit
	SLP Road
	Right of Way
	Schedule B CF Road
	Mineral Tenure Points
	Cities
	Waterbodies
	River/Stream
	Coastline / Island
1 (6.177 Km)	
PofC UTM10 606110, 5439843	
PofT UTM10 608912, 5442758	



MEMORANDUM

Williamson Lake Recreation Trail (REC3075) Legal Objectives (section 56, FRPA)

Under the authority of section 56 of the *Forest and Range Practices Act*, the following objectives are hereby established for this Recreation Trail.

The Management Intent statement describes the recreational values and use of the trail with the intention of focussing the individual who will be writing the results and strategies. The forest/range land manager is also guided by various supporting recreation management documents, including, among others, the *Recreation Features Handbook for BC, Appendix 2 - Recreation Trails - Best Management Practices for Forestry* (March 16, 2007).

The intent of the objectives is to give the individual additional guidance on how to manage for the recreation values of the trail. Objectives are written in the paradigm of addressing the tenure holder.

Management Intent

The Williamson Lake Recreation Trail is being managed for a semi-primitive non-roaded, non-motorized, hiking recreation experience. This popular trail begins within a second growth forest and continues up in elevation to Williamson Lake providing access to Mounts Welch and Foley.

Objectives

1. Maintain the unique recreation experience of hiking through a forested and sub-alpine setting;
2. Avoid building access structures unless no other practicable alternative exists; and
3. Maintain any new access structures in a manner that makes the best effort to prevent all motorized vehicles from accessing the trail.

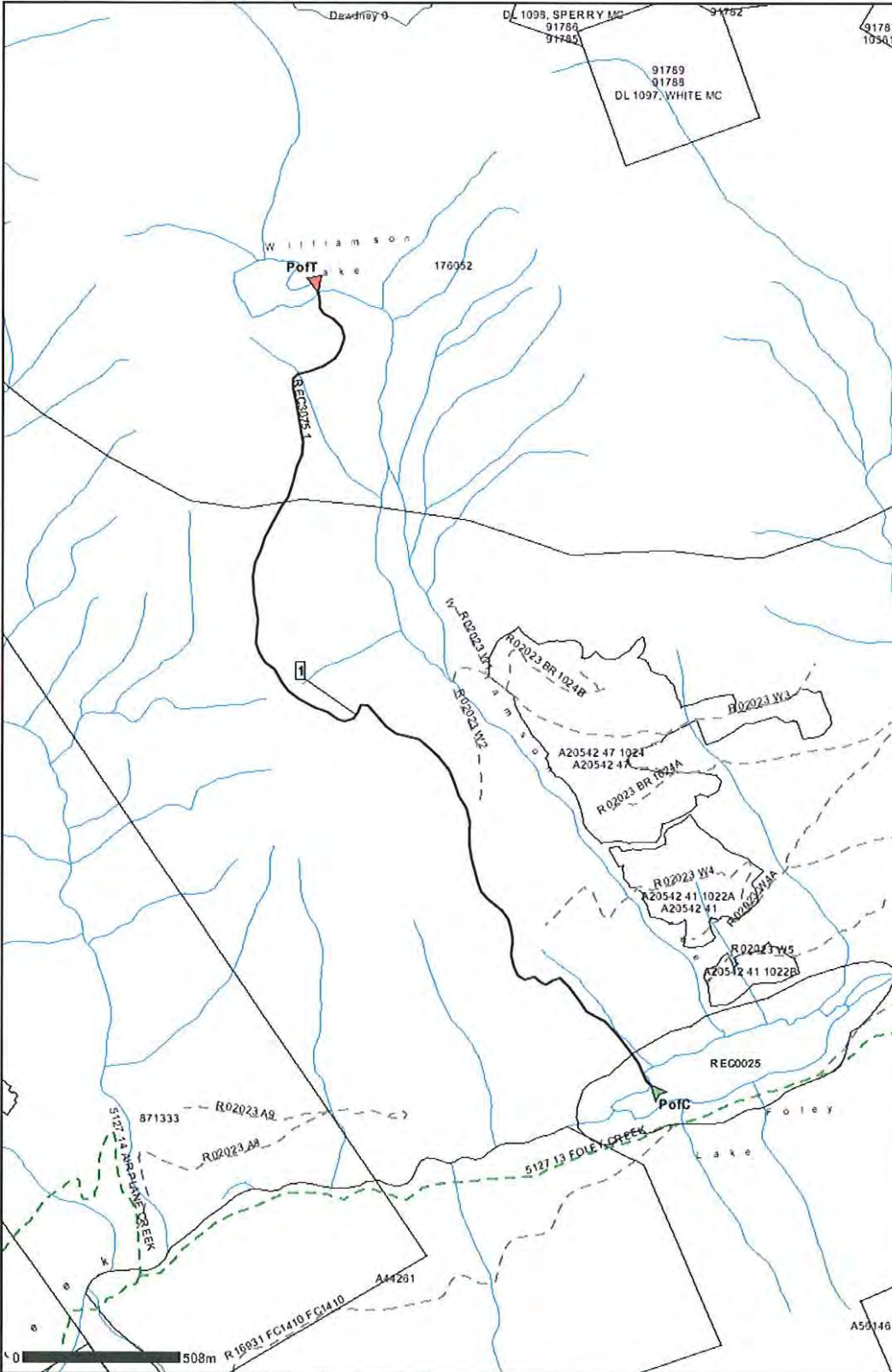
Paul Tataryn
Regional Manager
Coast Recreation Region

Effective date: Oct 10, 2012

File: 16660-20 REC3075 (Williamson Lake Trail)
Attachment: Exhibit A dated January 18, 2010



MAP OF : REC3076 Williams Lake Trail Amendment # 2 (shown in bold black)			
FOREST REGION : RCO FOREST DISTRICT : DCK	TSA : 30 LAND DISTRICT : Chilliwack Forest District	PULPWOOD AGREEMENT :	MGT UNIT TYPE : MGT UNIT NO :
ESF SUBMISSION ID : 783029 BCGS MAPSHEET NO : 92H.013	SCALE : 1:20000 at A Size Length (Km): 3.465	UTM : 10 NAD : NAD 83	DRAWN BY : FTA DATE : Jan 18, 2010



Legend

- Tenure Application
- Tenure Road Application
- Retired Tenure Road
- P of C
- P of T
- Tenure Feature
- Range
- TFL
- Provincial Forest
- Forest Service Road
- Highway
- Municipal Road
- Non Status Road
- Recreation Trails
- Road Permit
- SUP Road
- Right of Way
- Schedule B CP Road
- Mineral Tenure Points
- Cities
- Waterbodies
- River/Stream
- Coastline / Island

1 (3.465 Km)
 PofC UTM10 603541, 5442523
 PofT UTM10 602571, 5445102

Chilliwack Natural Resource District Established Recreation Sites and Trails w/t No Legal Objectives

Applicable FDU	Natural Resource District	Project	Project Type	Project Name	Established
Not Applicable	DCK - Chilliwack	REC3071	Heritage Trail	H.B.C.BRIGADE TRAIL	Established
Chehalis	DCK - Chilliwack	REC5513	Recreation Trail	MT GRAINGER TRAIL	Established
Not Applicable	DCK - Chilliwack	REC0024	Recreation Site	RAPIDS	Established
Not Applicable	DCK - Chilliwack	REC0030	Recreation Site	EATON CREEK	Established
Not Applicable	DCK - Chilliwack	REC0002	Recreation Site	TAMIHI CREEK	Established
Not Applicable	DCK - Chilliwack	REC0009	Recreation Site	PIERCE CREEK	Established
Not Applicable	DCK - Chilliwack	REC0011	Recreation Site	CAMP FOLEY	Established
Not Applicable	DCK - Chilliwack	REC0013	Recreation Site	RIVERSIDE	Established
Not Applicable	DCK - Chilliwack	REC0016	Recreation Site	COHO RUN	Established
Not Applicable	DCK - Chilliwack	REC0019	Recreation Site	ALLISON POOL	Established
Not Applicable	DCK - Chilliwack	REC0025	Recreation Site	FOLEY LAKE	Established
Not Applicable	DCK - Chilliwack	REC0039	Recreation Site	NAHATLATCH RIVER	Established
Not Applicable	DCK - Chilliwack	REC0047	Recreation Site	LOG CREEK	Established
Not Applicable	DCK - Chilliwack	REC0048	Recreation Site	FIR FLAT	Established
Not Applicable	DCK - Chilliwack	REC0064	Recreation Site	APOCYNUM	Established
Chehalis	DCK - Chilliwack	REC0065	Recreation Site	CHEHALIS RIVER	Established
East Harrison	DCK - Chilliwack	REC0066	Recreation Site	BEAR CREEK	Established
West Harrison	DCK - Chilliwack	REC0067	Recreation Site	WEAVER LAKE	Established
West Harrison	DCK - Chilliwack	REC0070	Recreation Site	FRANCIS LAKE HARRISON	Established
Chehalis	DCK - Chilliwack	REC0071	Recreation Site	CHEHALIS LAKE NORTH	Established
Chehalis	DCK - Chilliwack	REC0072	Recreation Site	SKWELLEPIL CREEK	Established
West Harrison	DCK - Chilliwack	REC0073	Recreation Site	WOOD LAKE	Established
West Harrison	DCK - Chilliwack	REC0074	Recreation Site	HALE CREEK	Established
West Harrison	DCK - Chilliwack	REC0075	Recreation Site	SUNRISE LAKE	Established
West Harrison	DCK - Chilliwack	REC0078	Recreation Site	TWENTY MILE BAY	Established
East Harrison	DCK - Chilliwack	REC0087	Recreation Site	CASCADE PENINSULA	Established
Chehalis	DCK - Chilliwack	REC0254	Recreation Site	CHEHALIS LAKE SOUTH	Established
East Harrison	DCK - Chilliwack	REC0304	Recreation Site	RAINBOW FALLS	Established
West Harrison	DCK - Chilliwack	REC0308	Recreation Site	LONG ISLAND BAY	Established
Not Applicable	DCK - Chilliwack	REC3038	Recreation Site	THURSTON MEADOWS	Established
Not Applicable	DCK - Chilliwack	REC3061	Recreation Site	SCUZZY CREEK	Established
East Harrison	DCK - Chilliwack	REC3113	Recreation Site	COGBURN BEACH	Established
Not Applicable	DCK - Chilliwack	REC0094	Recreation Reserve	SALSBURY LAKE EAST	Established
Not Applicable	DCK - Chilliwack	REC0286	Recreation Reserve	EAGLES ROOST	Established
Not Applicable	DCK - Chilliwack	REC0298	Recreation Reserve	DEVILS LAKE	Established
Not Applicable	DCK - Chilliwack	REC0299	Recreation Reserve	TAMIHI RAPIDS	Established
Not Applicable	DCK - Chilliwack	REC0325	Recreation Reserve	CYPRESS POINT	Established
Not Applicable	DCK - Chilliwack	REC3036	Recreation Reserve	TWIN BRIDGES	Established
Not Applicable	DCK - Chilliwack	REC3037	Recreation Reserve	KENYON LAKE	Established



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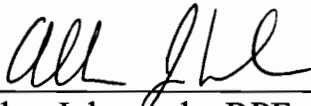
Appendix 8

Karst Resource Feature Order

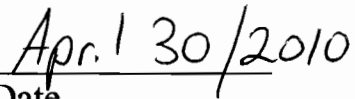
**ORDER TO IDENTIFY KARST RESOURCE FEATURES
IN THE
CHILLIWACK FOREST DISTRICT**

Pursuant to Section 5 of the *Government Actions Regulation* (GAR) of the *Forest and Range Practises Act*, I hereby identify the following surface or subsurface elements of a karst system as resource features wherever they are found within the area shown on the Karst GAR Order map dated April 28, 2010 in the Chilliwack Forest District. This Order is effective as of June 1, 2010.

- Karst caves
- The important features and elements within very high or high vulnerability karst terrain
- Significant surface karst features



Allan Johnstude, RPF
District Manager
Chilliwack Forest District



Date



Province of
British Columbia
Ministry of
Forests and Range

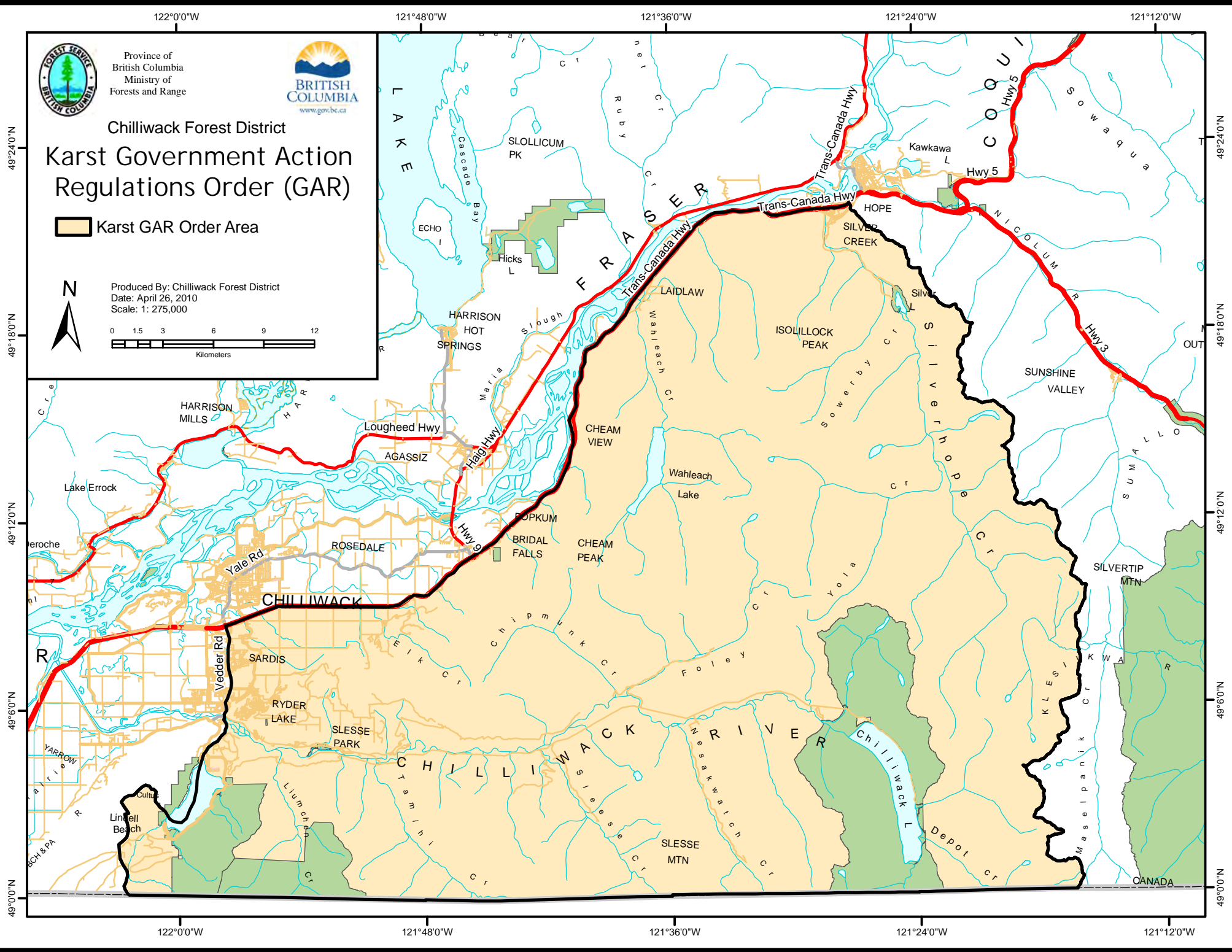
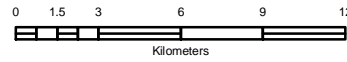


Chilliwack Forest District Karst Government Action Regulations Order (GAR)

 Karst GAR Order Area



Produced By: Chilliwack Forest District
Date: April 26, 2010
Scale: 1: 275,000





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Appendix 9

Cultural Heritage Resource Feature Order

Government Actions Regulation Order

File: 10285-20/RFEA/Mt Wood

Date: June 23, 2008

Order to Identify a Cultural Heritage Resource, Resource Feature on Mt. Woodside (Kweh-Kwuch-Hum) for the Chilliwack Forest District

Pursuant to Section 5 (1) (e) of the *Government Actions Regulation (GAR)* of the *Forest and Range Practices Act*, I hereby identify the following portion of Mt. Woodside (see attached), a cultural heritage resource – resource feature. Mt Woodside (Kweh-Kwuch-Hum) is culturally important to the Chehalis and other Coast Salish aboriginal people. Several reasons for this importance are:

- (1) **Location:** it is in close proximity to and visible from the present day Chehalis community and it contains historic and ancient village sites.
- (2) **Burial/Mortuary Sites:** the Band's historic cemetery is located here and there are numerous ancient burial mounds located within the area.
- (3) **Cultural and Spiritual Activity Area:** it has been a significant traditional use area especially for spiritual activities, both currently and in the past.

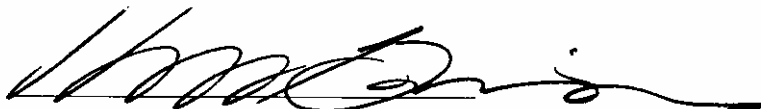
The establishment of the Kweh-Kwuch-Hum cultural heritage resource - resource feature, under a Government Actions Regulation (GAR) order, provides for the protection of this significant cultural and spiritual area. The establishment respects the sacredness of the area and will not damage or render ineffective the resource feature. It also provides licensees with a description of this cultural heritage resource - resource feature from which they can develop their plans under the *Forest and Range Practices Act*. The resource feature has been divided into the following two zones.

High Cultural Features and Use Area (Red Zone)

Purpose: to provide for the protection of this zone for the benefit of the Chehalis and other Coast Salish aboriginal people. Resource activities other than for traditional uses are not compatible. However, where there is no other practicable access route road building is permitted, provided it does not damage or render ineffective any cultural resource.

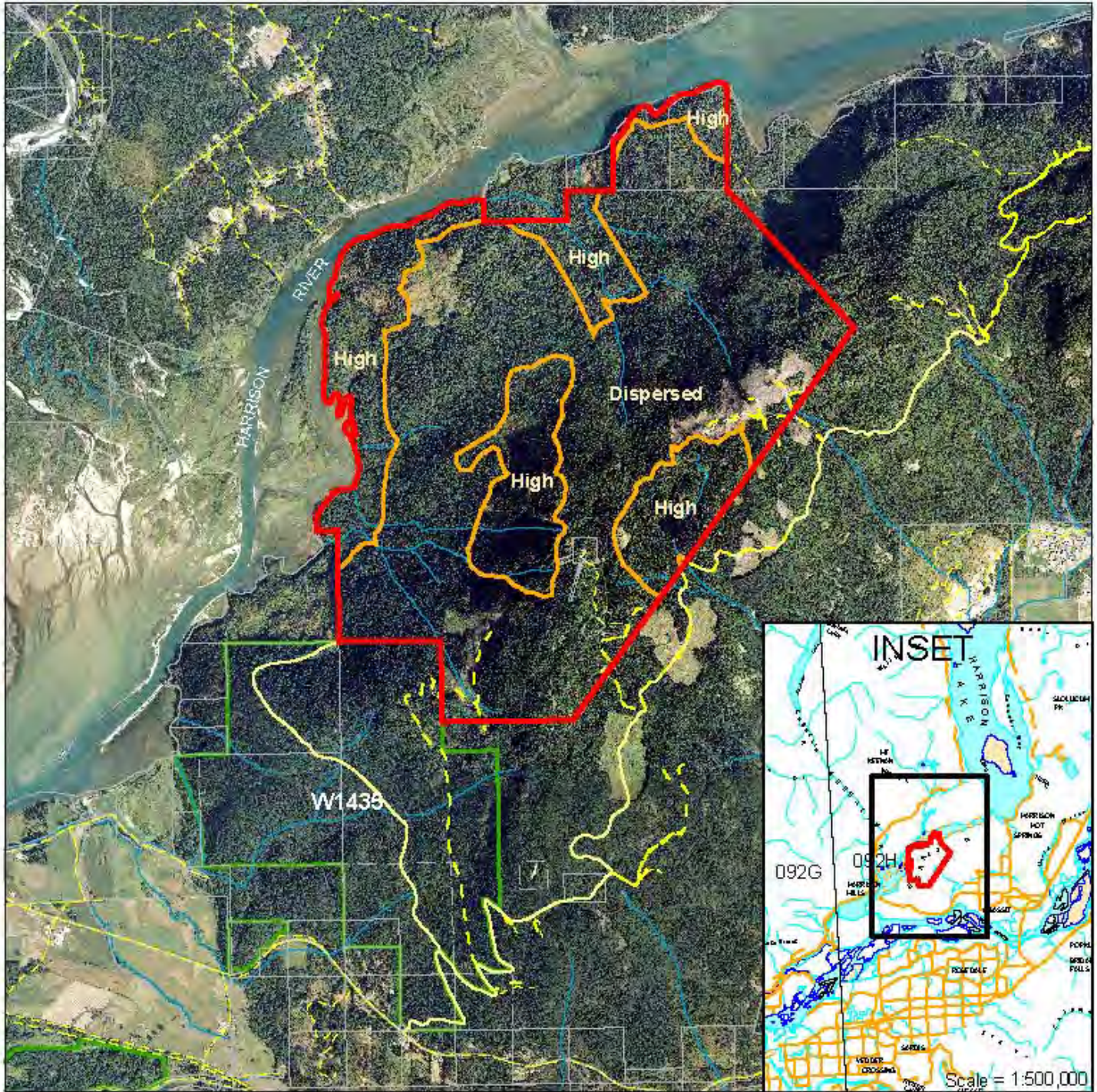
Dispersed Cultural Features and Use Area (Yellow Zone)

Purpose: to provide for the protection of important cultural aspects of the resource feature within the zone for the benefit of the Chehalis and other Coast Salish aboriginal people. Resource management activity could be considered where it does not damage or render ineffective the cultural resources of the feature.



Kerry Grozier
District Manager
Chilliwack Forest District

Mt. Woodside Government Actions Regulation Order



Legend

- | | |
|---|---|
|  Boundary for Order |  Interest Parcels |
|  Cultural Features |  Primary Survey Parcel |
|  FSR |  River/Stream |
|  Road Permit |  W1435 |
|  Transportation Lines - TRIM | |



Produced By: Chilliwack Forest District
 Date: January 31, 2008
 Scale 1: 40,000
 Ortho Image 2003



0 235 470 940 1,410 1,880 Meters

