



# Sustainable Forest Management Plan 17 (SFMP 17) 2017-2022

Nimpkish Defined Forest Area,  
TFL 37, and related licenses

January 2018

## Table of Contents

Introduction	1
Sustainable Forest Management	2
Canadian Standards Association (CSA)	2
The CSA Z809 Standard .....	2
SFM System	4
Environmental Management System (EMS) .....	5
SFM Plan (SFMP) .....	5
Nimpkish Woodlands Advisory Committee (NWAC) .....	6
Links to Management Plans and Operational Plans .....	6
Vancouver Island Land Use Plan .....	8
Lower and Upper Nimpkish Landscape Unit Plans (LUP's) .....	9
Third-Party Independent Audits .....	10
First Nations Involvement .....	10
Adaptive Management and Annual Reporting .....	11
The Defined Forest Area (DFA)	11
Nimpkish DFA	11
License Holder .....	16
Management Responsibilities .....	17
Description of DFA Tenures and Lands .....	17
First Nations .....	19
Resource Inventories	21
Forest Cover .....	21
Recreation .....	21
Visual Landscape .....	21
Cultural Heritage .....	21
Karst .....	22
Terrain Stability and Terrestrial Ecosystem Mapping .....	22
Watershed Assessments .....	22
Operability .....	22

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Fisheries .....	22
Wildlife .....	22
Plants and Plant Communities .....	24
<b>Management Strategies</b>	<b>25</b>
Biodiversity Conservation.....	25
Variable Retention .....	27
Wildlife .....	28
Fish Protection .....	29
Fire Control .....	30
Forest Disease Control.....	31
Windthrow Control .....	33
Terrain Management.....	34
Reforestation .....	34
Road Building and Maintenance.....	36
Site Restoration.....	36
Soil Conservation .....	36
Riparian Management.....	38
Forest Growth and Yield Plan .....	39
Benefits to Society .....	39
Forest Recreation.....	40
Visual Landscape Management .....	40
First Nations .....	42
Public Information and Involvement.....	42
Forest Monitoring & Research .....	43

## List of Figures

Figure 1	Overview of the SFM System.....	4
Figure 2	Link between legislation and the SFM Plan.....	7
Figure 3	Resource Management Zones.....	9
Figure 4	Regional perspective of the Nimpkish DFA.....	12
Figure 5	WFP’s Nimpkish DFA (Upper/Lower Nimpkish Landscape Units).....	13
Figure 6	Harvesting performance WFP’s (AAC) on TFL 37.....	18
Figure 7	Map Showing Boundaries of First Nations within the DFA.....	20
Figure 8	WFP Forest Strategy – Management Unit.....	27

## List of Tables

Table 1	Biogeoclimatic Ecosystems.....	14
Table 2	Major tree Species.....	14
Table 3	Landbase Summary of the Nimpkish Defined Forest Area 1.....	15
Table 4	WFP’s total allowable annual cut in its six Coastal Tree Farm Licenses.....	16
Table 5	Vertebrate species of potential management concern.....	23
Table 6	Plant and plant associations of potential management concern.....	24

## List of Appendices

Appendix 1	2015 Annual Report - Detailed Indicator Descriptions and Results.....	appendices_1
Appendix 2	VOIT Table.....	appendices_166
Appendix 3	Reference List.....	appendices_183
Appendix 4	Abbreviations and Definitions.....	appendices_186

## Introduction

Sustainable Forest Management (SFM) strives to maintain and enhance the long-term health of forest ecosystems, while providing ecological, economic, social and cultural opportunities for the benefit of present and future generations.<sup>1</sup>

The Sustainable Forest Management (SFM) Plan has been prepared to support Western Forest Products Inc.'s (WFP's) commitment to sustainable forest management, consistent with the Canadian Standards Association (CSA) Z809-2016 standard. The SFM Plan is designed to complement the following existing management systems and procedures:

- Environmental Management System including the Timberlands Sustainable Forest Management Statement and SFM Management Procedure;
- Safety Program (and related SAFE Company certification);
- Existing management plans (e.g., TFL 37 Management Plan); and
- Legal requirements (refer to Figure 2 and the EMS Manual, Legal and Other Requirements).

British Columbia has rigorous legislation and policies for protection, conservation, and sustainable management of forests. This legislative framework is improved continuously, as is forest management and policy.

In addition to applying these provincial and other regulatory tools, WFP benefits from using voluntary tools, such as CSA Certification, to aid in the achievement of sustainable forest management (SFM).

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<sup>1</sup> Canadian Standards Association Sustainable Forest Management Z809-08 Standard.

# Sustainable Forest Management

## Canadian Standards Association (CSA)

The Canadian Standards Association (CSA) is a non-profit, membership-based association, which has developed over 2000 standards for various industries. CSA develops both nationally and internationally accepted standards for values such as health and safety, quality of life and the environment.

### The CSA Z809 Standard

The CSA Z809-16 Sustainable Forest Management Standard is based on the Canadian Council of Forest Ministers (CCFM) SFM criteria and elements. The CCFM SFM criteria and elements are fully consistent with those of the United Nations Conference on Environment and Development (UNCED) Montréal and Helsinki processes, which are both recognized by governments around the world.

The CSA SFM Z809-2016 Standard requires:

- A systematic approach to management, based on continual improvement; and compliance with legislation, regulations and government policies, taking into account environmental, social and economic factors;
- Public participation in order to give local communities input into how forests are managed;
- Demonstration of sustainable forest management performance; and
- Third party audits to confirm adherence to the standard.

WFP is required to work closely with the public to identify local values, objectives, indicators, and targets that reflect the national criteria and to incorporate them into forest management planning and practices. WFP works jointly with the public during this process.

CSA Z809 is more than a system standard; it is also a performance standard, and it sets specific requirements for the public participation process.

This approach to performance not only respects government-recognized criteria for SFM but also allows the public to participate in the interpretation of sustainable forest management for the local forest.

The CSA Z809-16 Sustainable Forest Management Standard is the current standard through which WFP maintains its certification; the Z809-16 version supersedes all previous versions.

In 2016 the CSA/CAN Z809 underwent some changes. One of the major changes that occurred as part of the revision to the CSA Z809 standard were related to including compliance with the Constitution Act, Section 35 which provides for the protection of Aboriginal and treaty rights of Aboriginal Peoples in Canada<sup>2</sup>.

As stated in the CSA Standard “Aboriginal Rights” (including title) are not defined in the Constitution Act, but in recent court cases (Tsilhqot’in case) there is increasing clarity around Aboriginal and treaty rights and title. In addition to government rights to protect Aboriginal and treaty rights, Aboriginal-owned and operated businesses have recently been growing in Canada’s forest sector. The interest by Aboriginal communities to participate in the forest-sector economy is clear evidence that forest-sector business opportunities are compatible with the emerging national framework of Aboriginal and treaty rights and demonstrates the increasingly strengthened relationships between Aboriginal and non-Aboriginal Peoples. Adopting and implementing the Standard, with its new criterion on Aboriginal Relations, is consistent with both levels and engagement with Aboriginal Peoples in Canada<sup>2</sup>.

The CSA Z809-08 standard is available at:

<http://www.csagroup.org>

In July 1999, Englewood Forest Operation formally announced its commitment to seek SFM certification of the company's TFL 37 under the Canadian Standards Association (CSA) SFM system standard CAN/CSA-Z809-96. WFP was successful in its Certification efforts in August 2000, November 2002 and September 2005 to the Z809-02 standard. WFP became re-certified to the updated CAN/CSA Z809-08 Standard in April 2016.

The purpose of the CSA standard is to describe the components and performance objectives of a SFM system. This system ensures that an SFM Plan is produced which specifies quantifiable management objectives that address the seven criteria in the CSA SFM Standards.

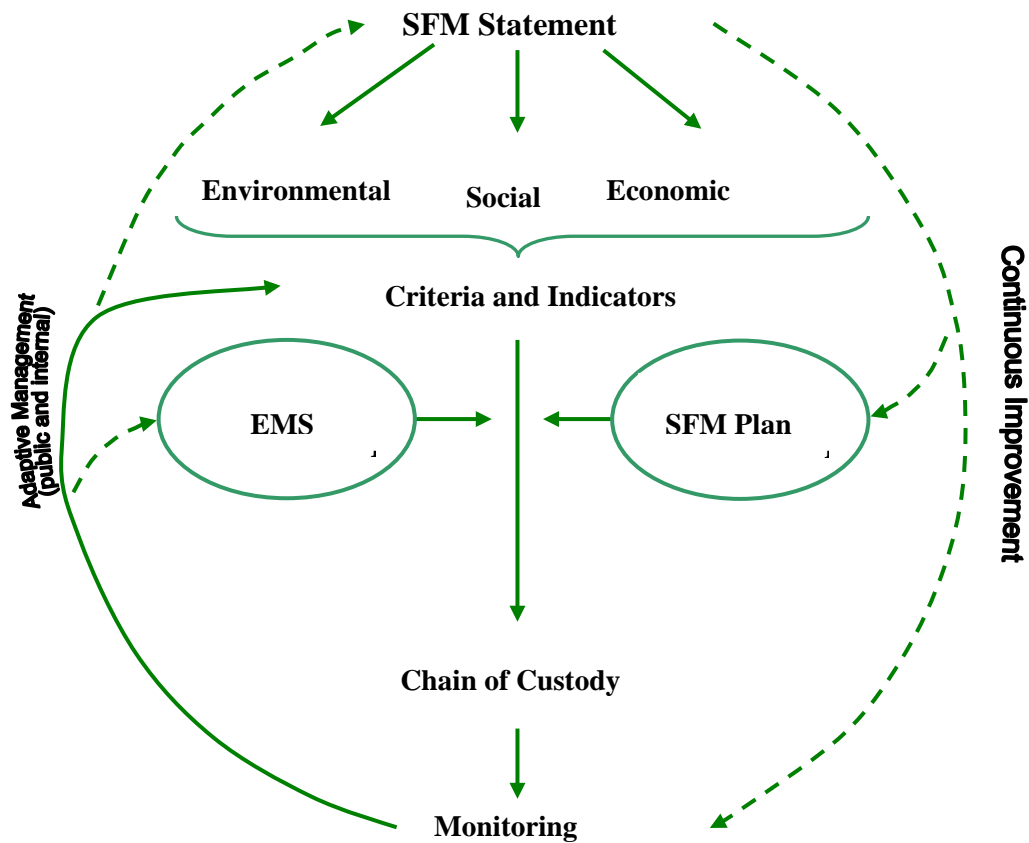
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<sup>2</sup> Canadian Standards Association Sustainable Forest Management Z809-16 Standard.

## SFM System

WFP maintains an SFM System under the Environmental Management System (EMS). The SFM System includes an SFM Statement documenting the corporate commitments to sustainable forest management, an SFM Management Procedure describing the general procedures/ outline for achieving SFM certification and the SFM Plan that contains the specific CSA Z809 Standard requirements.

**Figure 1: Overview of the SFM System**





## **Environmental Management System (EMS)**

The EMS is an adaptive management system allows for a systematic approach to continual improvement. It is based on the dynamic, cyclical process of: planning; implementation & operation; checking; and management review.

The core elements of the EMS are described within the EMS Manual and the corresponding supporting documents include, but are not limited to: Policies, Standard Operating Procedures (SOP's), Standards and Emergency Preparedness & Response Plans (EPRP's). These documents provide standards to guide daily activities out in the woods (i.e., "on the ground") in order to ensure environmental protection and compliance with legal requirements.

WFP has an EMS certified to the ISO 14001 standard. The EMS is designed to provide the structure necessary to implement a sustainable forest management (SFM) system.

## **SFM Plan (SFMP)**

The SFM Plan documents current and long-term SFM performance objectives and management strategies in the Englewood Forest Operation operating area, which is described for purposes of the SFM Plan as the Nimpkish Defined Forest Area (DFA).

The SFM Plan is an adaptation of existing planning processes including strategic and operational plans, analyses, standards, monitoring and public review. Management of forest land in the area has continued to evolve over time in response to changes in society's values. Revised Management Plans, submitted at approximately five-year intervals, include objectives, management strategies and analyses of management impacts. Standards and operating plans have been updated as changes occur. Monitoring has included corporate annual reports and both internal and external audits and inspection to evaluate conformance with management system requirements as well as compliance with current and changing legal requirements.

The values, objectives, indicators, targets, and management practices described in this document (developed by WFP and members of the CSA public advisory group known as the Nimpkish Woodlands Advisory Committee or NWAC) are currently understood and followed by Englewood Forest Operations (EFO) in working towards sustainable forest management on the DFA. The SFMP is an evolving document that is reviewed and revised on an ongoing basis with members of NWAC to reflect changes in the factors affecting forest management and community sustainability.

Ongoing review and input is provided by the public advisory group, TFL managers, and others through performance assessments, operational plan reviews, and processes related to specific land use issues such as landscape unit planning.

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## **Nimpkish Woodlands Advisory Committee (NWAC)**

As part of the SFM certification process, local residents and others who are affected by, or have an interest in, the Nimpkish DFA are identified and invited to participate in a Public Advisory Group (PAG). These people may include representatives of the local First Nations, local, regional, provincial and federal governments, wildlife interests, labour/worker interests, local contractors, recreation, tourism, value-added, and environmental interests.

Therefore, within the public participation process, the Nimpkish Woodlands Advisory Committee (NWAC) shall have opportunities to work with WFP to

- Identifying and select values, objectives, indicators, and targets based on SFM elements and any other issues of relevance to the DFA;
- develop, assess and select one or more possible strategies for achieving targets;
- review the SFM plan;
- evaluate results of monitoring programs, and discuss improvements and discuss any issues relevant to SFM in the DFA.

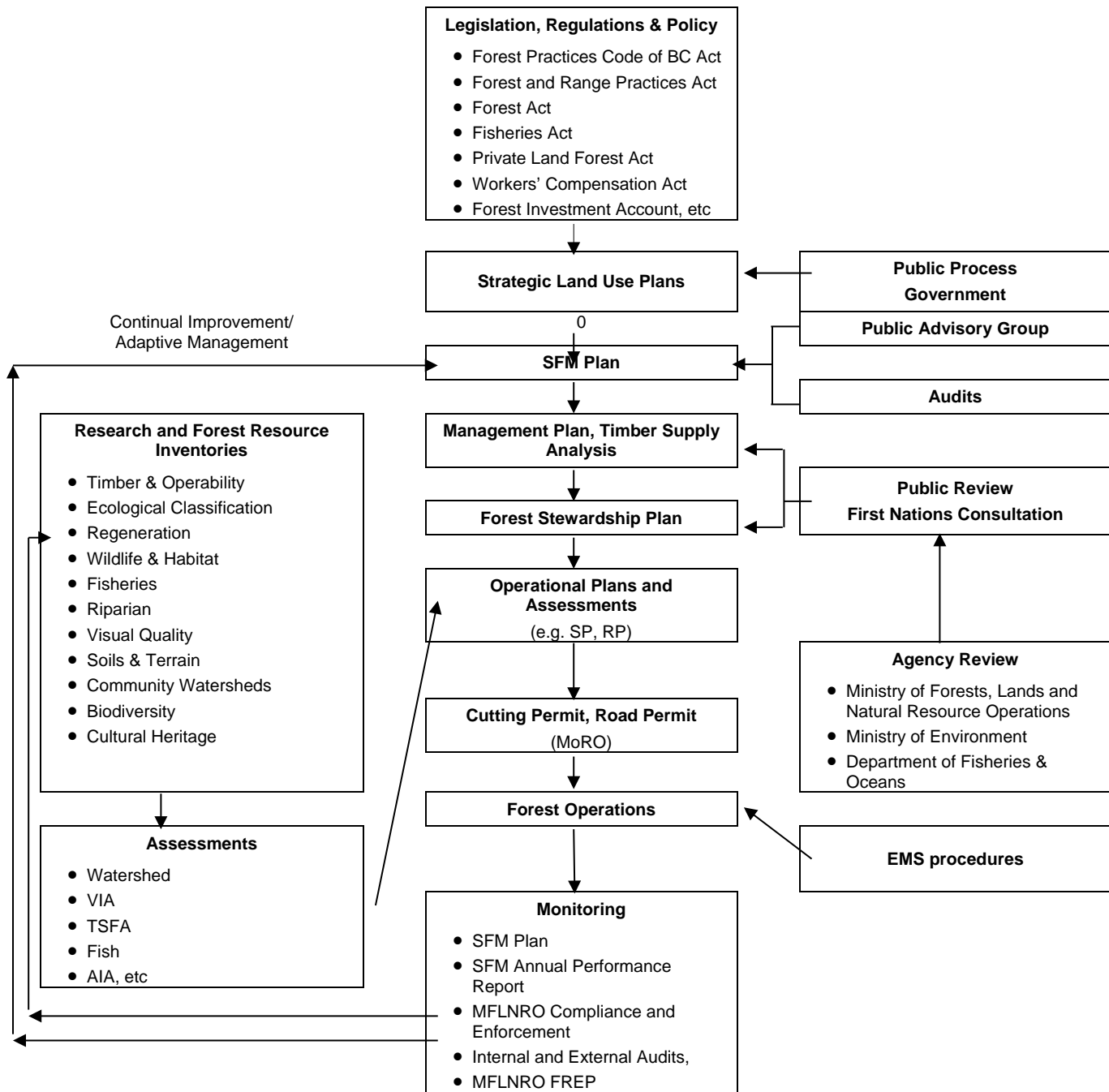
It is inherent within the process that the values, objectives, indicators and targets are consistent with relevant government legislation, regulations and policies.

The inaugural meeting of the NWAC was conducted on February 7, 2000. By March 13, 2000, the group had approved a Terms of Reference which clearly defines NWAC's goals, operating rules, timelines, communication procedures, roles and responsibilities, decision-making methodology, and mechanisms of dispute resolution.

## **Links to Management Plans and Operational Plans**

Figure 2 shows the links between operational planning and TFL Management Plans with the B.C. Forest and Range Practices Act (FRPA) –

**Figure 2. Link between legislation and the SFM Plan**



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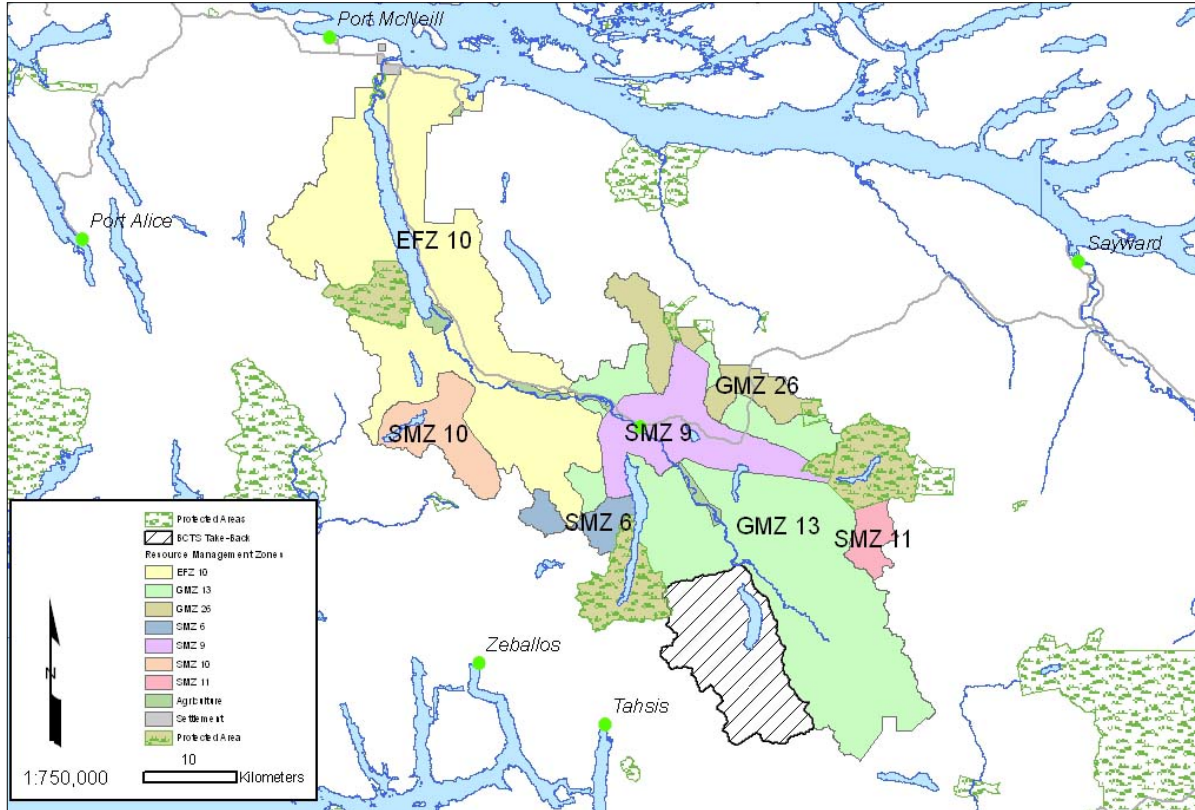
The SFM Plan is an umbrella plan that links higher level plans, such as the Management Plan, with operational plans. The performance commitments included in the SFM Plan equal or surpass commitments previously approved under TFL 37 Management Plans. The SFM Plan reflects the objectives, management strategies, and reporting structure of management plans. It is influenced by other higher level plans, such as the Vancouver Island Land Use Plan, and by legislation including the FRPA and associated Forest Stewardship Plan. The SFMP annual performance is reviewed and discussed during Management Review (on an annual basis). Conclusions drawn during Management Review are documented in the Management Review meeting minutes (where applicable).

## **Vancouver Island Land Use Plan**

Cabinet endorsed the Vancouver Island Summary Land Use Plan (VILUP) in February 2000 to provide, under one cover, the key components of strategic land and resource management decisions made by government for Vancouver Island as a result of its 1994 Land Use Decision with the VILUP. In addition to establishing new protected areas, under the Protected Area Strategy (PAS) throughout the area, this plan provides strategic direction, objectives and strategies for non-forest uses.

In December 2000 the VILUP, Higher Level Plan (HLP) order came into effect, establishing Resource Management Zones (RMZ's) and objectives within the area covered by the VILUP (see Figure 3). WFP incorporates the strategic direction of the HLP order into its strategic, tactical/development and operational planning levels.

**Figure 3: Resource Management Zones**



### Lower and Upper Nimpkish Landscape Unit Plans (LUP's)

In June 2004, two Landscape Units (LUs) were legally established within the DFA: the Lower Nimpkish LU (low biodiversity emphasis) and the Upper Nimpkish LU (intermediate biodiversity emphasis). Previously, portions of the draft Tsitika, Marble, Adam-Eve and Cluxewe LUs were located within the DFA. Landscape Unit Plans (LUP's) for the Lower and Upper Nimpkish LUs are complete.

The biodiversity chapters for these plans were approved by the BC Ministry of Agriculture and Lands in August 2005. These approved biodiversity chapters include the associated legal objectives for old growth retention and wildlife tree retention as well as a description of the units, discussion on significant resource values and a summary description of Old Growth Management Areas (OGMAs). The objectives approved under the LUP ultimately guide WFP planning initiatives and are therefore integral to SFM Plan 16.

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## **Third-Party Independent Audits**

To become certified to the CSA Z809 Standard, WFP must undergo a third-party, independent audit of the SFM requirements in this Standard. A registrar (certifier), accredited by the Standards Council of Canada, conducts the audit. The individual auditors employed or contracted by the registrar have the requisite forestry expertise and are certified as environmental auditors. Audits to this Standard are done by accredited certifiers and certified auditors who are independent of the standards-writing body (CSA).

In addition to the initial audit, there are mandatory annual reviews, which include both a document review and on-site checks of the forest to ensure progress is being made towards the achievement of targets and that the SFM requirements are being upheld. In addition, a full re-certification audit is required periodically following the initial certification.

## **First Nations Involvement**

First Nations' peoples are provided opportunity and are encouraged to contribute their knowledge and concerns into the process of setting the objectives in this SFM Plan. WFP provides copies of minutes of NWAC meetings related to the SFM Plan to inform the administrative offices of First Nations located within the Nimpkish DFA, but this is not considered involvement in the process and is not consultation.

First Nations information sharing with respect to the CSA certification is without prejudice to their aboriginal and treaty rights. First Nations related indicators are located within Criterion #7 in the SFM Plan.

The SFM system recognizes that Canadian forests have special significance to Aboriginal peoples. It further recognizes that the legal status of Aboriginal peoples is unique and that they possess special knowledge and insights concerning sustainable forest management derived from traditional practices and experience.

First Nations peoples are provided opportunity and are encouraged to contribute their knowledge and concerns into the SFM Plan process.

## **Adaptive Management and Annual Reporting**

Ongoing public advisory group participation will provide opportunities for continual input, learning, improvement, and the resolution of issues that may arise in the implementation of the SFM Plan and the WFP SFM System.

The adaptive management under WFP's SFM System (Figure 1) ensures that the SFM Plan remains relevant and a product of continual improvement. This is ensured by annual review with NWAC of the advisory group terms of reference, the WFP SFM annual report, annual completion by members of NWAC of a participant satisfaction survey, and review of any recommendations for SFM Plan improvement, for example any recommendations arising from the annual audit process.

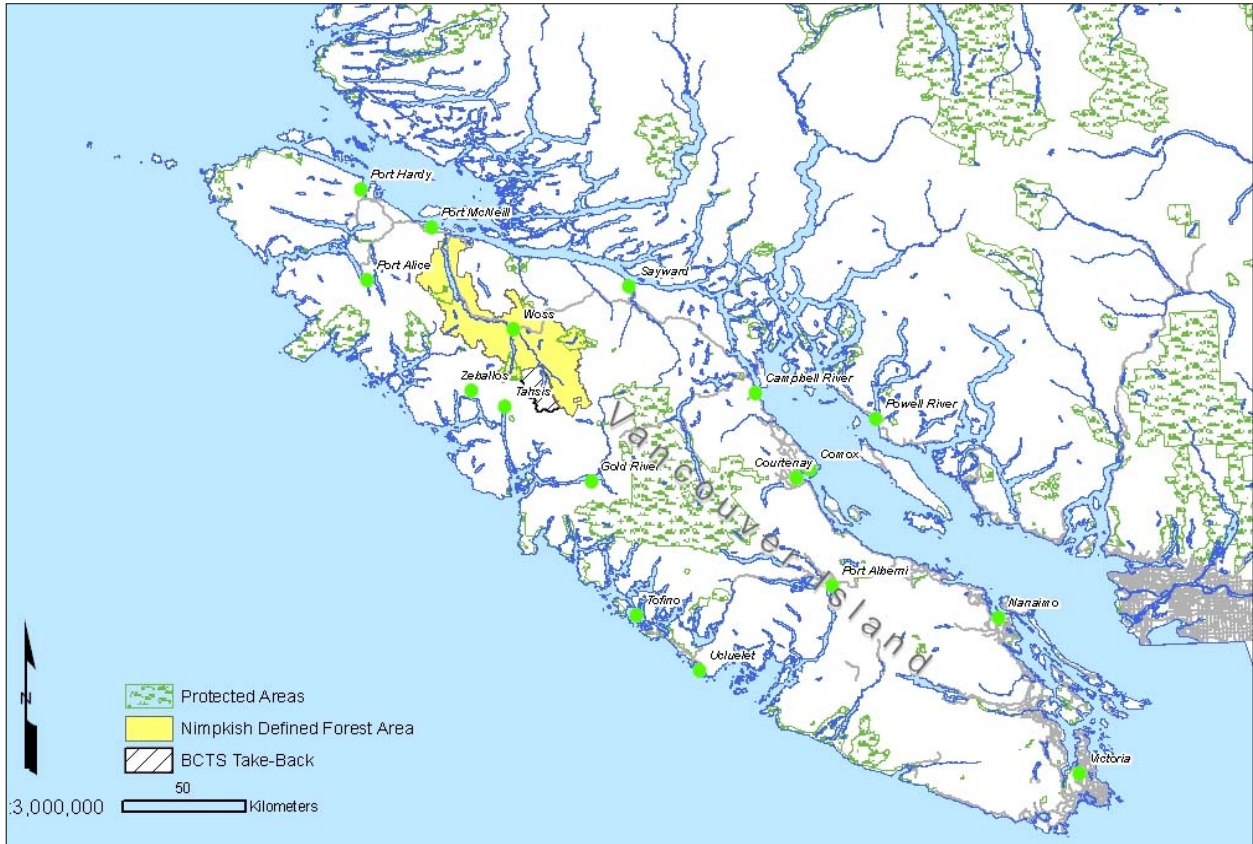
## **The Defined Forest Area (DFA)**

### **Nimpkish DFA**

In September 2015 WFP consolidated three forest operations (Mid Island, Englewood, and Nootka Forest Operation) into one single operation, the Central Island Forest Operation.

For the purposes of this plan, the Nimpkish Defined Forest Area (DFA) includes TFL 37 and protected areas but excludes the BCTS Take-Back area. The Nimpkish DFA includes land within the Upper Nimpkish and Lower Nimpkish Landscape Units (LUs). The DFA defined in SFM Plan 15 is updated from SFM Plan 9, to reflect the reallocation of timber tenure that occurred with the Forestry Revitalization Act (FRA – March 31, 2003). The Nimpkish DFA area now encompasses 178,441 hectares located in the north central portion of Vancouver Island, south of Port McNeill along Nimpkish Lake, and southeast to the headwaters of the Nimpkish River toward Gold River (Figure 4).

Figure 4. Regional perspective of the Nimpkish DFA



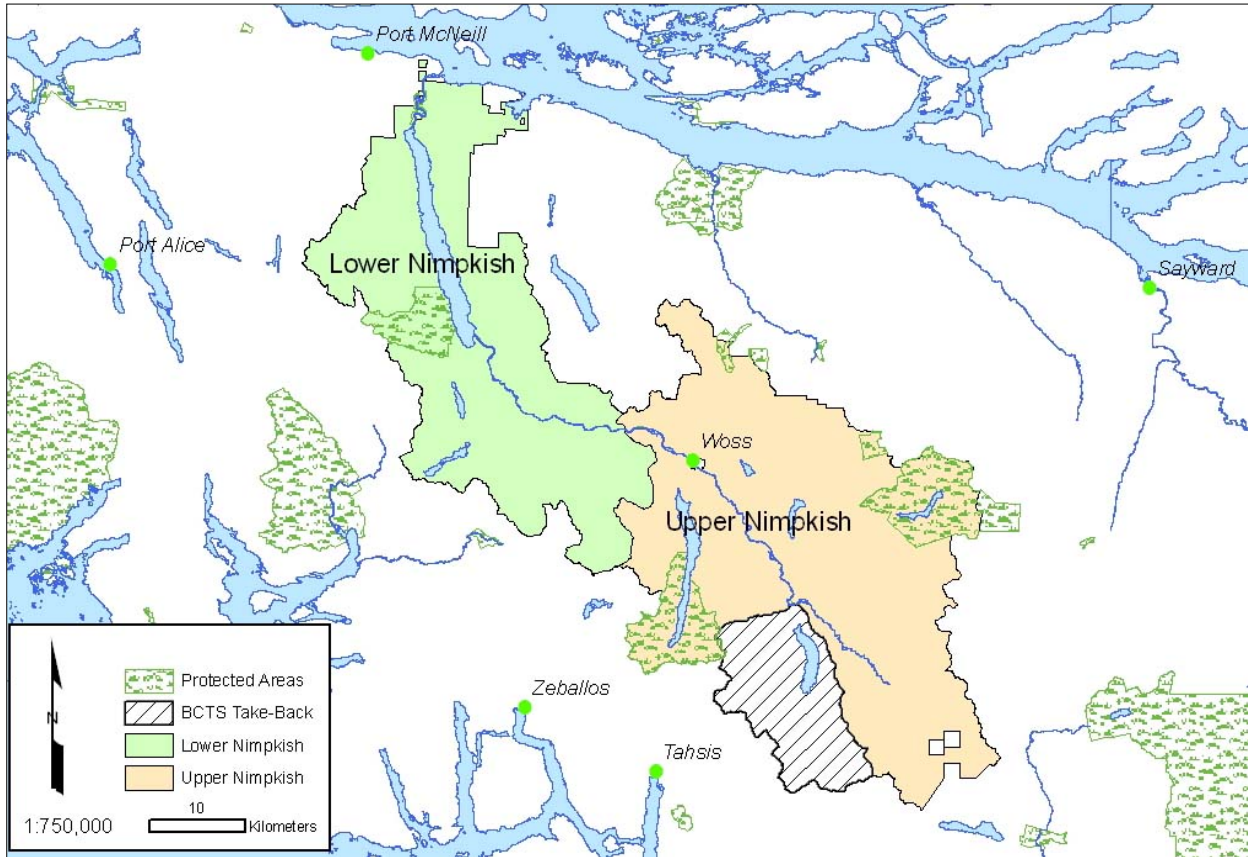
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After water, roads and other non-forest and non-productive areas are removed (40,554 hectares), 77% of the Nimpkish DFA is considered productive forest and 61% of the productive landbase (84,544 hectares) within the Nimpkish DFA is available for timber harvesting operations.

Figure 5 illustrates the locations of LUs within the Nimpkish DFA, and summaries of the biogeoclimatic ecosystems classifications (BEC's), major tree species and overall landbase, are respectively provided in Table 1, Table 2 and Table 3.

Figure 5. WFP's Nimpkish DFA, including boundaries of the Lower and Upper Nimpkish LUs.



**Table 1. Biogeoclimatic ecosystems.**

BEC Subzone	BEC Variant		Approximate Elevation Range (m)		% Total Area
Alpine Tundra and Glacier	ATc		1,400	1,600	3%
Mountain Hemlock	MHmmp1	Parkland	1,200	1,400	2%
	MHmm1	Windward Moist Maritime	900	1,400	19%
Coastal Western Hemlock	CWHvm2	Montane Very Wet Maritime	600	1,000	24%
	CWHvm1	Submontane Very Wet Maritime	0	600	30%
	CWHmm1	Submontane Moist Maritime	450	700	9%
	CWHxm2	Very Dry Maritime	0	400	13%

**Table 2. Major tree species**

Symbol	Common Name	Scientific Name
Act	Black cottonwood	<i>Populus trichoparpa</i> Torr. & Grey
Ba	Amabilis fir/Balsam	<i>Abies amabilis</i> (Dougl.) Forbes
Bg	Grand fir	<i>Abies grandis</i> (Dougl.) Lindl.
Bp	Noble fir	<i>Abies procera</i>
Cw	Western redcedar	<i>Thuja plicata</i> Donn.
Dr	Red alder	<i>Alnus rubra</i> Bong.
Fdc	Douglas-fir	<i>Pseudotsuga menziesii</i> (Mirb.) Franco
Hm	Mountain hemlock	<i>Tsuga mertensiana</i> (Bong.) Carr.
Hw	Western hemlock	<i>Tsuga heterophylla</i> (Raf.) Sarg.
Pl	Lodgepole pine	<i>Pinus contorta</i> var. <i>contorta</i> Dougl.
Pw	Western white pine	<i>Pinus monticola</i> Dougl.
Ss	Sitka spruce	<i>Picea sitchensis</i> (Bong.) Carr.
Tw	Pacific yew	<i>Taxus brevifolia</i> Nutt.
Yc	Yellow cedar/Cypress	<i>Chamaecyparis nootkatensis</i> (D.Don) Spach.

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**Table 3. Landbase Summary of the Nimpkish Defined Forest Area <sup>1</sup>**

Landscape Unit	BEC Variant	NPLB <sup>2</sup>	PLB <sup>3</sup>	NCLB <sup>4</sup>		THLB <sup>5</sup>	
		Hectares	Hectares	Hectares	% of PLB	Hectares	% of PLB
Lower Nimpkish (Low biodiversity emphasis)	CWHxm2	6081	12661	4228	33%	8433	67%
	CWHvm1	2872	26537	8209	31%	18327	69%
	CWHvm2	2242	13662	4839	35%	8823	65%
	MHmm1	3093	8126	5576	69%	2550	31%
	MHmmp	1854	n/a <sup>6</sup>	0	n/a <sup>6</sup>	0	n/a <sup>6</sup>
	ATc	1060	n/a <sup>6</sup>	0	n/a <sup>6</sup>	0	n/a <sup>6</sup>
<i>Landscape Unit Subtotals</i>		<i>17201</i>	<i>60986</i>	<i>22853</i>	<i>37%</i>	<i>38133</i>	<i>63%</i>
Upper Nimpkish (Intermediate biodiversity emphasis)	CWHmm	750	4998	1690	34%	3308	66%
	CWHxm2	3187	12734	3482	27%	9253	73%
	CWHvm1	1413	18749	5992	32%	12757	68%
	CWHvm2	2934	21802	6763	31%	15039	69%
	MHmm1	7014	13424	7371	55%	6054	45%
	MHmmp	2131	n/a <sup>6</sup>	0	n/a <sup>6</sup>	0	n/a <sup>6</sup>
ATc	5922	n/a <sup>6</sup>	0	n/a <sup>6</sup>	0	n/a <sup>6</sup>	
<i>Landscape Unit Subtotals</i>		<i>23353</i>	<i>76901</i>	<i>30491</i>	<i>40%</i>	<i>46410</i>	<i>60%</i>
<i>Nimpkish DFA Totals</i>		<i>40554</i>	<i>137887</i>	<i>53344</i>	<i>39%</i>	<i>84544</i>	<i>61%</i>

1. This summary was updated (P. Bryant, 2008) to reflect the removal of the B.C.T.S "Take-Back" area from the Nimpkish DFA.
2. NPLB – Non-Productive Landbase (e.g., alpine, roads, rock, water, swamp)
3. PLB – Productive Landbase is the productive forested area.
4. NCLB – Constrained Landbase is the productive forested area that is constrained from harvest due to some regulatory or physical impediment.
5. THLB – Timber Harvesting Landbase is the area available for long-term timber supply.
6. Any forested portions within MHmmp and ATc variants are excluded from the THLB altogether and therefore contribute 100% to the NPLB.

## License Holder

Western Forest Products Inc. is a leading integrated forest products company based in Vancouver, British Columbia (BC). WFP is the largest coastal British Columbia woodland operator and lumber producer with an annual available harvest of approximately 6.1 million cubic meters from timberlands and lumber capacity in excess of 1.3 billion board feet from six sawmills and one remanufacturing plant.

Principal activities conducted by WFP and its subsidiaries include timber harvesting, reforestation, sawmilling logs into lumber and wood chips, and value-added remanufacturing. Substantially all of WFP's operations, employees and corporate facilities are located in the coastal region of British Columbia, while its products are sold in over 25 countries worldwide.

WFP manages 6 Tree Farm Licences, 7 Forest Licences and has over 3200 direct employees and 1500 indirect (contract) employees. Table 4 lists WFP's Annual Allowable Cut in its six major replaceable Tree Farm Licences (TFL's).

**Table 4. WFP's total allowable annual cut in its six Coastal Tree Farm Licences**

Location	AAC
TFL 37-Englewood	843,763 m <sup>3</sup> <sup>1</sup>
TFL 6	1,350,422 m <sup>3</sup>
TFL 19	716,685 m <sup>3</sup>
TFL 25	215,937 m <sup>3</sup>
TFL 39	1,414,469 m <sup>3</sup>
TFL 44	782,482 m <sup>3</sup>

<sup>1</sup> AAC represents WFP portion only (excludes First Nation FRA)

## Management Responsibilities

TFL 37 is a renewable tenure on Provincial Crown land and administered by the Ministry of Forests, Lands and Natural Resource Operations under the Forest Act. These tenures are managed by WFP in conjunction with the Ministry of Forests Lands and Natural Resource Operations, Ministry of Environment, Ministry of Agriculture and other agencies. The primary roles and responsibilities are defined under a variety of legislation including, but not limited to, the Ministry of Forests and Range Act, Forest Act, and Forest and Range Practices Act. BC Parks have management responsibilities for the protected areas within the Nimpkish DFA. The protected areas are Nimpkish Lake Park, Claude Elliot Lake Park, Schoen Lake Park and Woss Lake Park. As previously mentioned on page 12, the *Forestry Revitalization Act* reallocated timber tenure within the former Nimpkish DFA (see SFM Plan 9 for former DFA Map) to the provincial government's BC Timber Sales (BCTS) program, as well as to the 'Namgis First Nation. The BCTS timber reallocation portion (commonly referred to as "take-back" area) has been geographically defined and therefore has been removed from the Nimpkish DFA.

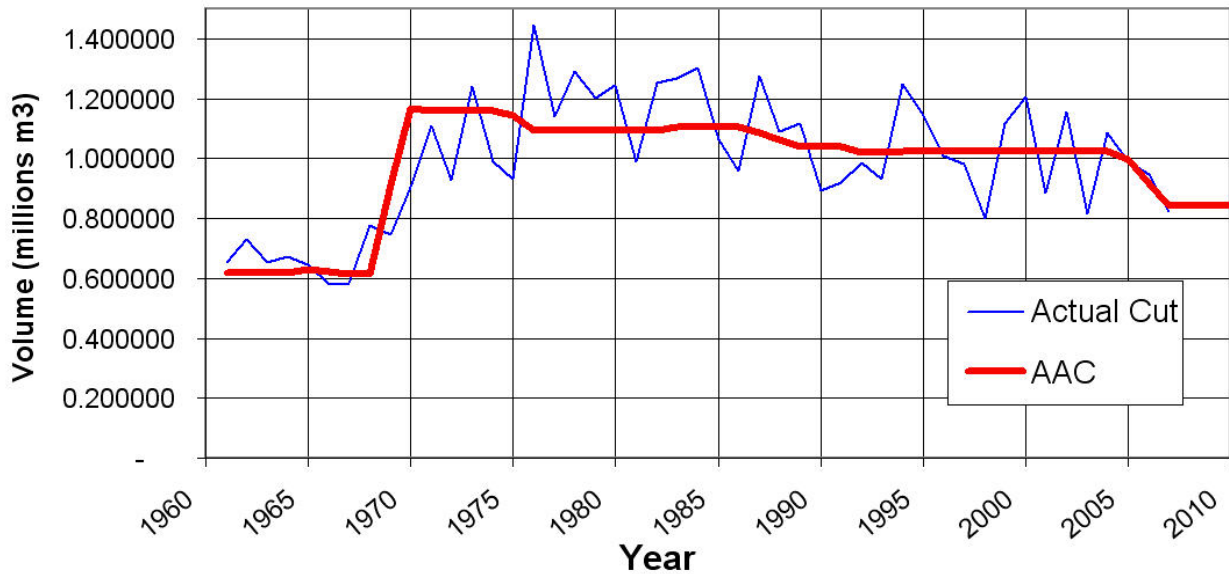
The 'Namgis First Nations' portion, however, will be managed strictly through volume reallocation in the form of a non-replaceable forest licence and is still within the Nimpkish DFA. All cutblock data associated with the 'Namgis licence is outside the scope of SFM Plan 17 and will not be included in annual reports except for the data associated with Indicator 2.2.2 (harvest profile).

## Description of DFA Tenures and Lands

TFL 37 was first awarded on December 28, 1960 for a 25 year term. Subject to satisfactory levels of performance, the licence has been replaced every five years with an associated 25-year term. There have been no significant changes to the ACC of TFL 37 since 1970. However, WFP's portion of the AAC was significantly impacted by the Forestry Revitalization Act's volume reallocation (see Figure 6).

The most recent AAC determination was set at 843,763 cubic meters and was effective on October 1, 2013.

Figure 6. Harvesting performance relative to WFP's allowable annual cut on TFL 37.



Since the previous SFM Plan was completed in 2005, management of the Nimpkish DFA has been influenced by the following events:

The Englewood Logging Division of Canadian Forest Products Ltd (Canfor) was purchased by Western Forest Products Inc. (WFP) on March 17, 2006.

On September 10, 2015, WFP Inc. amalgamated the Mid Island, Englewood and Nootka Forest Operation into the Central Island Forest Operation. A new FSP for the CIFO Operation was approved May 9<sup>th</sup>, 2017 and guides all operational activities for the Englewood Forest Operation.

SFM Plan 17 is consistent with this key operational planning document.

WFP's "Forest Strategy", an ecosystem-based forest management program, was adopted in order to replace Canfor's "Forestry Principles".

## First Nations

First Nation participation in NWAC does not prejudice aboriginal or treaty rights.

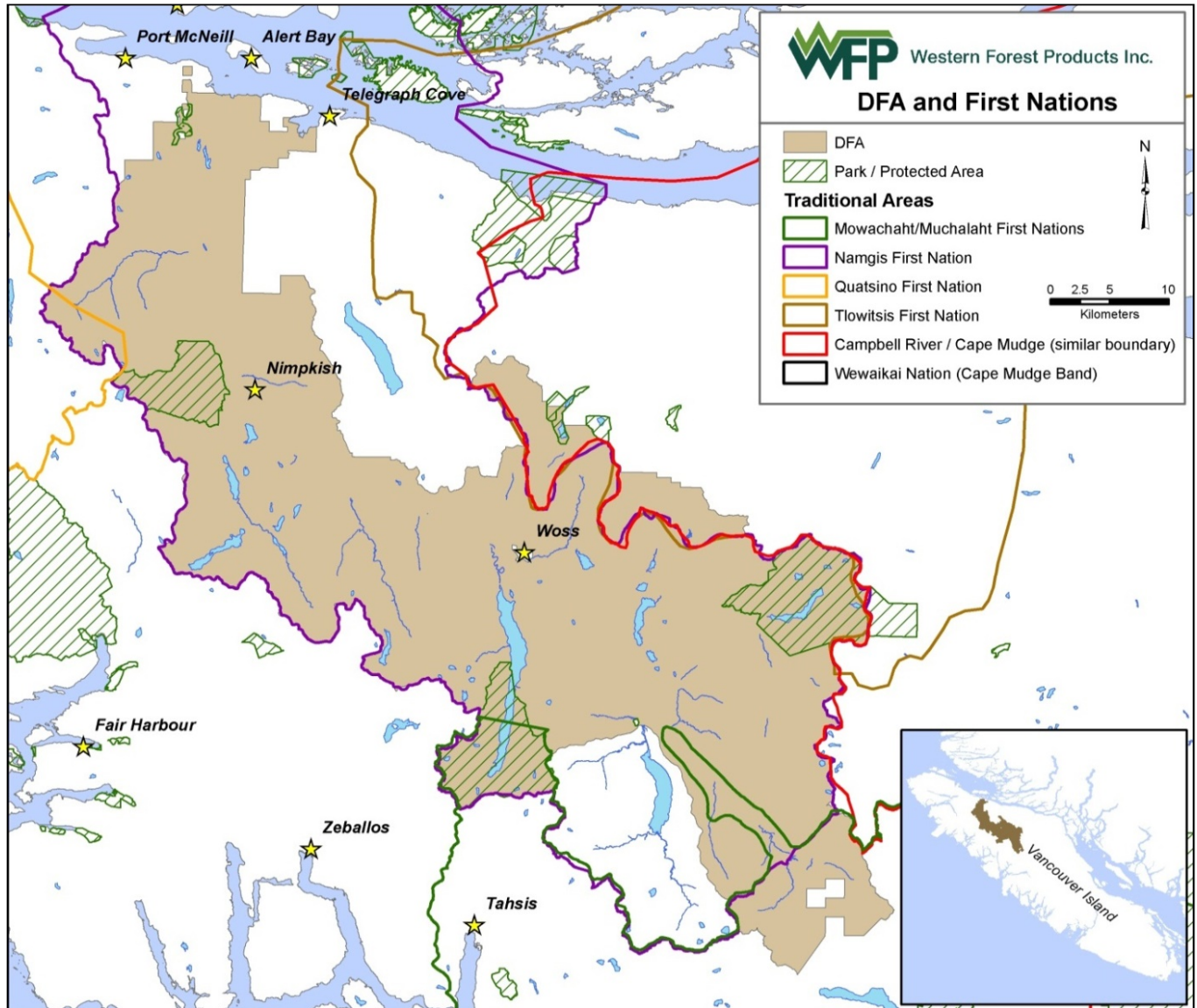
NWAC meetings do not, in any way, intend to define, interpret, or prejudice ongoing or future discussions and negotiations regarding these legal rights and do not stipulate how to deal with treaty rights.

The Defined Forest Area falls within the traditional territories of the following First Nations:

- Mowachaht/Muchalaht First Nation
- 'Namgis First Nation
- Quatsino First Nation
- Kwakiutl
- Maa-Nulth First Nations
- Nanwakolas: Tlowitsis/Wei Wai Kum First Nation (Campbell River Indian Band)
- Laich-Twil-Tach Treaty Society: We Wai Kai First Nation (Cape Mudge Band)

See Figure 7 for boundaries of traditional territories of First Nations within the DFA.

Figure 7. Map Showing Boundaries of Traditional Territories of First Nations within the DFA



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## Resource Inventories

An impressive variety of resource inventories have been completed for TFL 37. These are periodically updated as needed to meet strategic or operational planning needs. Key inventories are briefly discussed below.

### Forest Cover

Several projects focused on improving forest cover information within TFL 37. These projects included:

- Photo Interpretation (Phase I) – Classification completed in June 1998 to MoFLNRO 1992 standard.
- Ground Sampling (Phase II) – Sampling forest cover polygons and compiling the data was completed in February 2002 to Vegetation Resources Inventory (VRI) standard.
- Adjustment – Statistical analysis and adjustment of the forest cover inventory was completed in June 2004 to VRI standard.
- Net Volume Adjustment Factors (NVAF) – Sampling trees from the Phase II project, compiling, analyzing and adjusting the forest cover inventory was completed in June 2004 to VRI standard.
- LiDAR- LiDAR flights were completed in the summer of 2016 and delivered for use in the division in March 2017.

### Recreation

The most recent recreation inventory was completed in May 1995 to the Ministry of Forest Lands and Natural Resource Operations standard, while a separate inventory of recreation sites was last updated in July 1996.

### Visual Landscape

The current visual landscape inventory was updated to resource inventory standards committee (RISC) in January 2002.

### Cultural Heritage

An archaeological overview assessment for the North Island Central Coast Forest District identifies culturally sensitive areas. This was prepared by the Archaeological Branch, Ministry of Small Business, Tourism and Culture.

## Karst

A planning-level karst inventory was completed according to RISC standards in March 2004.

## Terrain Stability and Terrestrial Ecosystem Mapping

In March 2000, a multi-year inventory project that combined terrain stability mapping (TSM) and terrestrial ecosystem mapping (TEM) was completed. This project was conducted according to RISC standard.

In October 2007, historic landslide data within TFL 37 was analyzed by Glynnis Horel P.Eng. A regional landslide frequency map was produced in order to assist Foresters and Engineers in developing terrain risk management strategies.

This inventory is being updated, along with the incorporation of LiDAR. The results are anticipated in early 2018.

## Watershed Assessments

In October 2007, all major watersheds in the Nimpkish DFA were analyzed by Glynnis Horel P.Eng. The inventory reported on current watershed conditions, trends, fisheries values and management strategies (see Indicator 3.2.1 in this SFM Plan for additional information).

An update to this analysis is currently occurring with the use of LiDAR information and is anticipated to be completed in the spring of 2018.

## Operability

In October 2000, the physical operability of the landbase was refined and updated in spatial GIS coverage. This was derived through an analysis of slope, terrain and ecosystem. The latest economic operability analysis was prepared in September 1997 through an analysis of slope, roads and forest cover.

In November 2017 a Landscape Blocking project was initiated across all TFL's within WFP. It is to be incorporated as a new GIS layer meant to leverage WFP's recent investment in LiDAR.

## Fisheries

Classification and field-checks of strategic stream networks was completed in February 2004, according to the MoF's, fish stream identification procedures

## Wildlife

Wildlife species of potential management interest that may occur within the Nimpkish DFA include those species identified on the following lists:

Species at Risk Act, (SARA) Schedule 1;

Forest and Range Practices Act (FRPA) Category of Species at Risk;

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The species summarized in Table 5 from the lists above are either known or suspected of being on the Nimpkish DFA.

Table 5. Vertebrate species of potential management concern

Common Name	Scientific Name	SARA Schedule 1	Category of Species at Risk
<b>AMPHIBIANS</b>			
Red-Legged Frog	<i>Rana aurora</i>	Special Concern	Y
Western Toad	<i>Bufo boreas</i>	Special Concern	N
<b>BIRDS</b>			
Pacific Great Blue Heron	<i>Ardea herodias fannini</i>	Special Concern	Y
'Queen Charlotte' Goshawk	<i>Accipiter gentilis laingi</i>	Threatened	Y
'Vancouver Island' White-tailed Ptarmigan	<i>Lagopus leucurus saxatilis</i>	n/a	Y
Marbled Murrelet	<i>Brachyramphus marmoratus</i>	Threatened	Y
Western Screech-owl	<i>Megascops kennicottii kennicottii</i>	Special Concern	N
Northern Pygmy-owl	<i>Glaucidium gnoma swarthi</i>	n/a	Y
<b>MAMMALS</b>			
Common Water Shrew, brooksi subspecies	<i>Sorex palustris brooksi</i>	n/a	Y
Keen's Long-eared Bat	<i>Myotis keenii</i>	n/a	Y
Vancouver Island Marmot	<i>Marmota vancouverensis</i>	Endangered	Y
Wolverine	<i>Gulo gulo vancouverensis</i>	Threatened	Y

Wildlife monitoring and inventory activities are directed according to the following management priorities (considering significant overlapping priorities between species):

- Species immediately at risk as a result of proposed forest management activities (i.e., site-specific concerns);
- Federally-listed Species at Risk;
- Provincial legal listed Species at Risk;
- Species of conservation priority (under development by BC Ministry of Environment).

## Plants and Plant Communities

Plants and plant associations of potential management interest, which may occur within BEC site series of the Nimpkish DFA, include those forest-dependent species and communities identified in Table 6.

Table 6. Plant and plant associations of potential management concern<sup>1</sup>

Common Name	BEC Site Series	BC/CDC
<b>PLANTS<sup>2</sup></b>		
Oldgrowth specklebelly lichen ( <i>Pseudocyphellaria rainierensis</i> )		Red
Snow bramble ( <i>Rubus nivalis</i> )		Red
Cryptic paw lichen ( <i>Nephroma occultum</i> )		Blue
White wintergreen ( <i>Pyrola elliptica</i> )		Blue
<b>PLANT ASSOCIATIONS<sup>3</sup></b>		
Sitka spruce / salmonberry	CWHxm2/08, CWHvm1/09	Red
Douglas-fir – swordfern	CWHxm2/04	Red
Douglas-fir - lodgepole pine / reindeer lichens	CWHxm2/02	Red
Western redcedar / three-leaved foamflower	CWHxm2/07	Red
Western hemlock - Douglas-fir / Oregon beaked-moss	CWHxm2/01	Red
Western hemlock - western redcedar / deer fern	CWHxm2/06	Red
Western redcedar / black twinberry	CWHxm2/14	Red
Western redcedar / salmonberry	CWHxm2/13	Red
Amabilis fir – Sitka spruce / devil's club	CWHvm1/08	Blue
Lodgepole pine / peat-mosses Very Dry Maritime	CWHxm2/11	Blue
Black cottonwood / red alder / salmonberry	CWHmm1/09, CWHvm1/10, CWHxm2/09	Blue
Douglas-fir - western hemlock / salal Very Dry Maritime	CWHxm2/03	Blue
Western redcedar – slough sedge	CWHxm2/15	Blue
Western redcedar - Sitka spruce / skunk cabbage	CWHxm2/12, CWHmm1/12, CWHvm1/14	Blue
Western redcedar / sword fern Very Dry Maritime	CWHxm2/05	Blue
Western redcedar - western hemlock / sword fern	CWHmm1/04, CWHmm2/04, CWHvm1/04, CWHvm2/04	Blue
Western hemlock - western redcedar / salal	CWHvm1/03, CWHvm2/03	Blue

<sup>1</sup> BC Conservation Data Centre. 2008. BC Species and Ecosystem Explorer, BC Min. Environ., Victoria, BC, Available: <http://a100.gov.bc.ca/pub/eswp/> (29 July 2008)

<sup>2</sup> Only plants with probable or higher likelihood of occurrence within forested ecosystems are listed here.

<sup>3</sup> Only plant associations with structural stages 6 and 7 (mature and old forested stands) are considered here. List includes all potential units, not necessarily mapped (TEM) in the DFA.

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## Management Strategies

The following general management strategies are presented as a high level overview of the strategies being implemented on the DFA. Appendix 2 (Indicator Details & Results) also describes specific management strategies related to each indicator.

### Landscape Level Planning

Concern for sustainability of ecosystems has led to increasing demand for landscape level planning to ensure that ecosystem functioning and plant and animal habitats are conserved. Substantial areas consisting largely of old growth forests have been reserved on inoperable or sensitive soil sites, and as riparian, wildlife and recreation reserves. These areas are described in Timber Supply Analysis reports

The Forest and Range Practices Act (FRPA) requirements for landscape and stand level biodiversity have been applied within TFL 39. Direction from the MoFLNRO and the MoE has emphasized old seral stage representation at the landscape level and on variation in stand structure, primarily through Old Growth Management Areas (OGMAs) and Wildlife Tree Patches (WTPs).

Cabinet endorsed the Vancouver Island Summary Land Use Plan (VILUP) in February 2000 to provide, under one cover, the key components of strategic land and resource management decisions made by government for Vancouver Island as a result of its 1994 Land Use Decision with the VILUP. In addition to establishing new protected areas, under the Protected Area Strategy (PAS) throughout the area, this plan provides strategic direction, objectives and strategies for non-forest uses.

In December 2000 the VILUP, Higher Level Plan (HLP) order came into effect, establishing Resource Management Zones (RMZ's) and objectives within the area covered by the VILUP (see Figure 3). WFP incorporates the strategic direction of the HLP order into its strategic, tactical/development and operational planning levels.

There are two landscape units (Upper and Lower Nimpkish) and seven Resource Management Zones (see Figure 5 in report).

Western Forest Products is continuing to develop a capability for landscape reporting and spatial forecasting. This includes reporting by BEC (Biogeoclimatic Ecosystem Classification) variant on reserved areas, seral (age) classes, and interior old growth and patch sizes. These reports will be useful for describing the current situation and as a basis for developing strategies to achieve landscape objectives when they are available. The recently developed spatial forecasting tool has been used to project at a strategic level the implementation of variable retention over the DFA for the next 60 years. This is being linked to a spatial habitat supply model to allow the assessment of landscape planning options on the provision of future habitat.

### Biodiversity Conservation

Substantial areas, largely old growth, have been reserved throughout the DFA on inoperable or

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sensitive soil sites as riparian, wildlife or recreation reserves and, increasingly, as permanent Variable Retention reserves according to the guidelines set forth under the Western Forest Strategy. Biodiversity conservation requirements are in place at the stand level. They are defined at the larger, landscape levels through provincially assigned Biodiversity Emphasis Options and through the Western Forest Strategy.

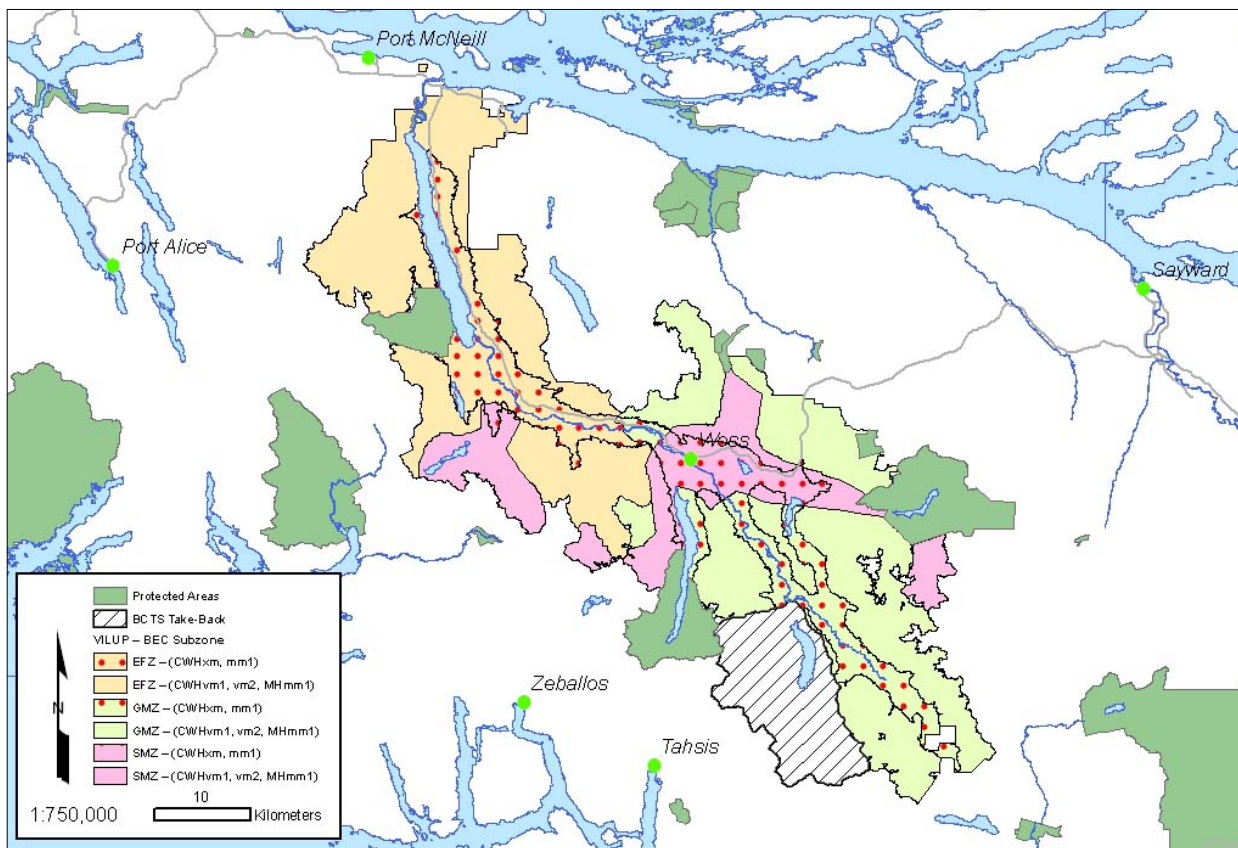
Developing a biodiversity conservation strategy that is based on management of individual species is not feasible or effective because practices that benefit some species are often detrimental to others. The development of an ecosystem management approach that provides suitable habitat conditions for all native species will provide habitat diversity that in turn provides species biodiversity.

The strategy for biodiversity conservation is:

- Institute landscape-level ecological planning.
- Plan forest management activities based on Western Forest Strategy.
- Work with the government specialists to further develop objectives and strategies for landscape units.
- Implement ecologically based stand-level requirements as required under the Western Forest Strategy and Forest Stewardship Plan.
- Choose species mixtures for reforestation based on ecological site adaptation.
- Consistent with FSP Results and Strategies' and Western Forest Strategy, retain leave tree reserves or wildlife tree patches to enhance structural diversity of harvested areas.
- Improve knowledge through inventory and research.
- Cooperate with other agencies in research and inventory projects on species of concern.

The goal of conserving biodiversity will be achieved at the stand level by applying different standards for the retention silvicultural system across the Nimpkish DFA, based on a combination of Ecosections, VILUP Zones and BEC units (Figure 8).

Figure 8: WFP Forest Strategy – Management Unit



## Variable Retention

The term **variable retention** (VR) is used to describe an overall approach to harvesting and silvicultural systems that retains trees and associated habitat for purposes other than timber management and traditional silviculture goals. Variable retention can be implemented with a wide range of harvesting systems, and can utilize traditional silvicultural systems, such as shelterwood or selection, to meet forest regeneration objectives. As the name implies, various levels of retention can be used with different types, amounts and spatial patterns of structure. Retention can be dispersed throughout a cutblock (as individual trees or small clumps) or aggregated in larger groups and patches, depending upon the objectives. There is such a wide range of possibilities within the VR concept that it is not a “one size fits all” approach.

The term **retention system** refers to a specific silvicultural system designed to meet the goals of variable retention. It was originally defined in the BC Operational Planning Regulations (March 1999) and has 3 requirements: 1) retention of trees distributed across the cutblock; 2) trees are left for the long term (at least one rotation); 3) distribution of leave trees achieves >50% “forest influence”. The specific

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definition of the retention system is: *“a silvicultural system that is designed to:*

1. retain individual trees or groups of trees to maintain structural diversity over the area of the cutblock for at least one rotation, and
2. leave more than half the total area of the cutblock within one tree height from the base of a tree or group of trees, whether or not the tree or group of trees is inside the cutblock.”

The distribution of long-term retention over the area of the cutblock is open to interpretation, but the spatial requirement in “2” for “forest influence” provides the minimum standard for distribution. The retention system is no longer officially defined in BC legislation; however the BC Forest Planning and Practices

Regulation (Div.5, 64(4)) exempts harvesting that maintains >50% forest influence and meets other spatial requirements from maximum cutblock size restrictions. The retention system is considered a “partial cutting” approach and is categorized as an “even-aged” system despite the resulting uneven-aged forest because the cut areas are regenerated and managed much like other even-aged systems.

The retention system normally uses a one-pass harvesting approach, but may also be prescribed with several harvesting entries. The three main variants of the retention system are: group, dispersed, and mixed. For safety, economic and ecological reasons, group retention is often preferred; however, all three variants have advantages for specific objectives.

## Wildlife

Wildlife issues are twofold in scope: (1) habitat protection for large mammals and threatened or endangered species; and (2) biodiversity concerns related to conservation of animals and plants and the maintenance of ecosystem processes. Current knowledge is often limited and limiting and new knowledge requires a process of adaptive management. The main current issues are:

- identification and protection of specialized habitats for large mammals, primarily deer and elk
- identification and preservation of the best marbled murrelet nesting areas and release of previously protected areas that appears not to be used
- actions needed to maintain habitat for rare and endangered plants, animals, and ecosystem processes



**The wildlife protection strategy is to:**

- comply with the Forest and Range Practices Act and the FSP
- comply with government stated measures to manage WHAs, UWRs
- provide operations and agency personnel feedback on guidelines as part of an ongoing process of improving conservation
- liaise with government wildlife and habitat protection staff on wildlife issues, especially to identify and protect critical habitat
- continue assessments of ranges, habitat diversity, wildlife trees, etc., and protect significant values
- continue surveys to identify and preserve key marbled murrelet nesting sites and obtain release of protected sites that are apparently of little or no value
- manage riparian zones as directed by the stream indicators and objectives; as feasible, enhance protection on smaller streams particularly through the use of VR design.
- support other monitoring and research activities to increase knowledge of habitat resource requirements and the impacts of management activities on these

## **Fish Protection**

The fishery resource value is generally high and protection of fish habitat and water quality ranks as a significant priority. Biological issues dominate in the sense of conserving fish stocks and habitat. At the same time, managers are also concerned with meeting the letter of the law. The issues are:

- To update classification of waters within the DFA. This includes: detailed site specific information for operational planning and a broader, but accurate portrayal of the impacts of riparian management for strategic analysis.
- Mitigation, enhancement, and habitat restoration.
- Cooperation with First Nations and other stakeholder groups.
- To determine measures for protecting endangered populations.
- Management of riparian areas.

**The strategy for responding to these issues is to:**

- Continue to undertake detailed stream inventories for operational plans.
- Continue to identify and implement enhancement, mitigation, and rehabilitation opportunities with FIA funding.
- Achieve full compliance in meeting the requirements of the FRPA and the FSP.
- Work with agencies to design and deliver training to woods workers.

## **Fire Control**

Englewood Forest Operation's primary objective is to prevent fires through good housekeeping, diligent equipment maintenance, and strict control of operations as fire danger rises. The goal is to contain all fires within 24 hours of detection. Fire prevention and control are governed by operating plans and procedures:

- Pre-suppression plans are prepared annually;
- Emergency plans exist for fires not controlled within 24 hours, and
- Ground and aerial patrols are made as required by regulation.

Englewood Forest Operation and its Contractors maintain and use their own fire suppression equipment. If needed, further equipment can be obtained from other operating units or government resources.

Englewood Forest Operation is connected to the government Fire Weather Information Network. It also employs strategically located fire weather stations to monitor weather in the various operating areas. Data from these stations are used to modify or cease operations according to hazard rating, risk and fire danger rating.

The EMS Emergency Preparedness and Response Plan also details the specific fire equipment requirements and response actions.

## Forest Disease Control

Wood volumes lost to disease in the old growth forest have been estimated as highly significant by the CFS. However, measurements from Western Forest Products permanent sample plots for nearly 30 years suggest that growth is balancing mortality.

The forest contains a number of parasitic fungi that can kill trees or degrade log quality and value. The most significant of these in the Nimpkish DFA are hemlock mistletoe, laminated root rot; Annosus root rot, Armillaria root disease and white pine blister rust.

Active preventive measures are now limited to mistletoe, Armillaria root disease, laminated root rot and white pine blister rust.

### **Strategies for addressing Hemlock dwarf mistletoe (*Arceuthobium tsugense*) include:**

- Prescribing the removal infected trees; and/or regeneration of non-susceptible species.
- Implementing strategies before susceptible regeneration is 3m in height.
- Regeneration and Free growing surveys are completed according to the most current Silviculture Survey Procedures Manual which outlines damage agents, conditions and Free Growing damage criteria.

### **Strategies for addressing laminated root rot caused by the fungus (*Phellinus weirii*), include:**

- Visually assessing old growth and second growth stands proposed for harvest for the presence of laminated root rot during engineering and Site Plan (SP) field work (as required).
- A general trigger for root rot potential within the Nimpkish DFA is areas within the Very Dry Maritime Subzone (CWHxm) Biogeoclimatic unit.
- If the presence is negligible, no further survey is required; if the presence is identified as low, a walk through survey is required.
- If the presence is high, a survey may be more appropriate and is conducted by appropriate individuals during the engineering and/or SP field work phase. A grid survey is not required if the location of centers are obvious (e.g. between two roads). If the infection is so severe, the entire cutblock may require treatment, or may be managed for a non-susceptible species for the next rotation. Maps outlining the incidence of root rot are kept on file when a detailed survey has been completed.
- Laminated root rot in retention patches will be allowed if expected windthrow in the remaining stand is considered acceptable (as defined by a windthrow assessment).
- Consider the management of a mixed hardwood/conifer or hardwood Standard Unit (SU) or Stand for the next rotation where site characteristics are appropriate (as allowed in the Forest

Stewardship Plan - FSP)

- Stumping practices have not been implemented on the Nimpkish DFA since the 90s as the cost of such treatments are significant and steeper terrain has been a factor as stumping practices requires level terrain.
- Prescribing the regeneration of appropriate moderately susceptible species, tolerant species and/or Immune species within root rot areas. Highly susceptible species are avoided within identified root rot areas.
- Regeneration and Free growing surveys are completed according to the most current Silviculture Survey Procedures Manual which outlines damage agents, conditions and Free Growing damage criteria.

**Strategies for addressing Armillaria root disease (*Armillaria ostoyae*) includes:**

- Strategies for addressing Armillaria root disease within the Nimpkish DFA are the same as described above for laminated root rot.
- Differences in management strategies may include the species planted within root rot areas as per the guidance of the Root Disease Management Guidebook (Forest Practices Code Guidebook 1995) or other relevant research and reports as they are made available.

**Strategies for addressing white pine blister rust caused by the fungus (*Cronartium ribicola*) include:**

- Selecting retention or reserve areas, preferring stands with a zero or low level of infection.
- Prescribing the: removal infected trees; and/or regeneration of non-susceptible species
  - The use of resistant white pine (Pw) seedlots with an M-value (M+75) when planting are preferred and the use of Pw seedlots with an R-value (R+50) is secondary preference as the resistance is lower for those particular seedlots.
- Regeneration and Free growing surveys are completed according to the most current Silviculture Survey Procedures Manual which outlines damage agents, conditions and Free Growing damage criteria.
- Pruning of Pw saplings as required is determined through stand performance (Pre-FTG walkthroughs), generally a few years prior to the Free Growing survey or as a result of the findings from the Free Growing survey.
- The use of resistant white pine (Pw) seedlots and the general low overall percentage of Pw prescribed for reforestation within a given cutblock have reduced the frequency of required pruning

activities within the Nimpkish DFA.

## Windthrow Control

Today's small cutblock sizes and variable retention reserves within cutblocks expose more timber edge to potential damage from strong wind events. The strategy to minimize losses due to windthrow includes:

- Assessment of susceptibility to windthrow and application of the Western Windthrow Management Strategy.
- Determining the natural windthrow factors associated with a particular cutblock design (e.g., cutblock size, stand characteristics, soil properties, location and orientation to expected winds) at the site plan stages based on knowledge of historic wind patterns and assessments. Wind firmness is also a key factor guiding selection of groups and individual trees for in-stand retention.
- Determining the potential extend of windthrow associated with a particular cutblock if no mitigation is taken.
- Determining which forest management objectives may be impacted if windthrow occurs adjacent to a particular cutblock.
- Management practices are applied according to the assessed risk of windthrow. These practices may include feathering of edges, pruning of trees, leaving larger buffers around the forest resources identified to be managed, topping of trees, locating WTR in low windthrow risk areas, partial cutting, reconfiguring edges to a naturally wind firm edge, realigning boundaries to reduce the windthrow risk, partial salvage.
- Monitoring of windthrow and recovery of windthrow where practical and ecologically appropriate.
- Use of wind hazard maps.
- Training of field personnel to recognize the potential for windthrow.

## Terrain Management

Terrain Stability Hazard Mapping has been completed for the Nimpkish DFA, which ranks the DFA landscape based on terrain class.

Strategies to minimize the incidence of landslides associated with harvesting include:

- Regularly use road construction methods such as full bench/end haul when building roads on unstable or potentially unstable terrain.
- Where roads are no longer required for access, deactivate and/or rehabilitate roads to reduce the risk of road failure and/or reduce site degradation.
- Identify any areas with erosion, slope stability, or sensitive soil concerns during engineering. Refer potential problem areas to a terrain specialist for a Terrain Stability Field Assessment (TSFA).
- Stabilize with grass seed and reforest slides characterized by non-consolidated (i.e. productive) material.
- Follow TSFA recommendations.
- Implementation of a WFP Terrain Risk Management Strategy.

## Reforestation

Consistent with the silviculture management objectives, Englewood Forest Operation will regenerate the forest at densities that ensure full site coverage and high yields of quality timber. Englewood Forest Operation will bear the silviculture costs for basic silviculture in compliance with the Forest Act. Other treatments on crown land will be undertaken if FIA funding is available. The company expects to receive a share of the FIA fund proportionate to its contribution.

Species selection – Englewood Forest Operation bases species selection first of all on the silvicultural characteristics of the individual species and their adaptability to the particular site, including forest health considerations. The second criterion for selection is species value ranking. This is based on the company view of the wood qualities and desirability at harvest. Currently, cypress, cedar, and Douglas-fir rank highest. Species selection will be consistent with the stocking standards approved within the FSP.

Forest tree seed – The WFP Englewood Forest Operation complies with the Chief Foresters Standard for Seed Use. All seed is ordered through the Ministry of Forests and Range (MOFR) Seed Planning and Registry System (SPAR) system and all seedlings planted are reported electronically back to the MFR. This double check system ensures that the seed used is MOFR registered.

Site Preparation – Anticipated site preparation necessary to renew the forest is prescribed post harvest. Site preparation methods that may be prescribed include mechanical piling or dispersal of slash, or accumulation burns and stumping. Each method is considered in terms of economics, environment, and government regulation before the optimal solution is prescribed.

Regeneration methods – Most sites are planted in order to attain early green-up, thereby freeing adjacent areas for harvest. Immediate planting is normally prescribed on highly productive sites because of the likelihood of weed invasion. Where it is anticipated that natural regeneration will not reach at least the minimal acceptable level two years before the end of the regeneration delay period, planting will be prescribed.

Free growing assessment – The normal assessment regime for each site prior to claiming free growing status is:

- A post-harvest survey confirms prescribed treatments regarding slash loading and disposal, site preparation, regeneration method, and timing still apply.
  - Where natural regeneration has been prescribed, a stocking survey is made at least two years prior to the end of the regeneration delay period. If it appears the target will not be met, planting will be undertaken. (Currently Englewood does not implement widespread natural regeneration, therefore the majority of areas harvested are prescribed for planting).
  - A survival survey generally occurs about one year after planting. If necessary, a fill plant or a replant is scheduled.
  - A stand performance survey (Pre-FTG walkthrough) is scheduled (based on risk) to confirm stocking status and forest health after the regeneration survey and before the free growing (FTG) survey. If needed, fill planting, weed control, and/or other assessments are scheduled.
  - A final free growing survey is carried out near the end of the late free growing period.

## Road Building and Maintenance

Road building Standard Operating Procedures document plans/strategies for road construction and maintenance and for road deactivation. General strategies for the maintenance of roads include recapping, grading, adding or replacing culverts, roadside brushing, ditching short sections of road, applying dust control, bridge replacement, minor resurfacing and development of pits and quarries.

All permitted roads and bridges meet legislative requirements. New bridges and major stream crossings are reviewed with fisheries officials.

Where existing non-permitted roads are required for harvesting they are permitted and brought up to standard.

## Site Restoration

Roads and landings are maintained or deactivated according to the conditions of the Road Permit unless needed for other purposes. Backspar trails as necessary and appropriate, are restored by such techniques as ripping, spreading of debris, construction of anti-erosion barriers, and sowing of grass seed.

## Soil Conservation

The DFA can experience some very high rainfall events. Where these high rainfall events occur on steep terrain, there is potential for landslides and surface soil erosion. Inventories of terrain stability have been completed for the Nimpkish DFA. Terrain stability mapping has also been completed for the Nimpkish DFA. The issues are:

- **Potentially unstable terrain** — Landslides are a natural and inevitable phenomenon that contributes to the evolution of the landscape. Although landslides occur in both logged and unlogged terrain, logging and road building can increase their frequency. Impacts of landslides include acceleration of sediment delivery to streams, possible damage to fish and invertebrate habitat and productivity, loss of productive forest site, unsightly scars, and damage to roads, culverts, and bridges.
- **Surface soil erosion** — Surface soil erosion is the wearing away of the earth's surface by water, wind, and gravity and includes rill and gully erosion. "Accelerated" erosion, in excess of "geologic" erosion, results from human activities. Accelerated erosion causes on-site impacts (soil loss, nutrient loss, lower productivity) and off-site impacts (water quality, sedimentation, and habitat).
- **Soil disturbance** — certain soil types are sensitive to disturbance from road building and yarding



activities. If these sensitive sites are not identified in advance of forest development, then soil compaction, poor drainage, puddling, and soil displacement can result in loss of productive forest sites.

**Englewood Forest Operation's strategy for soil conservation is:**

- Complete harvest plans in accordance with the Terrain Risk Management Strategy.
- Assess all Class IV and V (Es1 and Es 2) terrain prior to road construction or harvesting to evaluate terrain stability and provide recommendations on:
  - whether or not development should proceed,
  - best road and cutting boundary locations or changes to proposed layout or road alignment,
  - riparian management areas,
  - possible mitigative actions and criteria,
  - road construction or harvesting constraints, and
  - Special road construction or harvesting techniques.
- Inspect drainage ditches and culverts regularly and take preventative measures to minimize the potential for debris flow initiation and soil erosion.
- Deactivate roads that are no longer needed for management access, forest protection, or other purposes.
- Identify potentially unstable (sensitive) sites.
- Where ground based harvesting is proposed, carry out site sensitivity assessments for soil compaction, soil displacement, surface soil erosion, and forest floor displacement.
- Where it is practical and economic, reduce the amount of permanent site degradation below 7%.
- De-activate roads that are not important for the road network.
- Carry out internal and external audits to evaluate road building practices and stream management.

## Riparian Management

Riparian areas are used by many species of wildlife. These areas are reserved by way of no-harvest areas along streams. Generally, larger streams have greater levels of retention. Retention of trees may also be required where a stream is dependent on large woody debris for channel stability and/or stream bank stability.

The Riparian Management Area (RMA) consists of a Riparian Management Zone (RMZ), and where required, a Riparian Reserve Zone (RRZ). The widths of the RMAs are determined by the attributes of the adjacent riparian feature. Attributes such as gradient, fish presence, width of stream, and size of wetland may impact the size of the RMA and the requirement for a RRZ.

### **Riparian management strategies include:**

- Wherever possible, locate road to avoid RMAs.
- Propose road locations through RMAs where no other option exists, or locating the road outside the RMA would create a higher risk of sediment delivery to streams.
- Vary retention specifications for RMZs according to site conditions.
- Undertake professional assessments as necessary.
- Incorporate recommendations of assessments into Harvest Instructions.

### **Strategies to protect fish habitat and non-fish streams may include:**

- Basal area retention in RMZs based on riparian class and site-specific conditions.
- Partial cutting silviculture systems or no harvest buffers.
- Selecting trees to retain to reduce the risk of windthrow and to protect wildlife values.
- Where there are significant concerns about windthrow in the RMZ: extend the boundaries of the RMZ to a windfirm boundary; eliminate sharp corners or indentation from the outer boundary of the RMZ; and/or use edge stabilization treatments including feathering, pruning, or topping.
- Additional practices such as: retention of all non-merchantable conifer trees, understory deciduous trees, shrubs, and herbaceous vegetation within 5m of the channel to the fullest extent possible; retention of wildlife trees; falling and yarding away; removal of introduced tops and small woody debris; felling of shallow rooted, windthrow-prone leaners across the stream so that the butt clears the channel or the stem spans both streambanks. Stems will be removed from the stream if it can be done without damage to the channel or bank and in compliance with the Federal Fisheries Act.

## Forest Growth and Yield Plan

Growth and Yield work continues, subject to Forest Investment Account FIA funding. Partially funded FIA studies include:

- The establishment and measurement of one large scale (80 ha) and several edge studies examining the effects of different amounts and patterns of variable retention on growth of the next crop. A small pilot project will be undertaken to monitor (through random samples) the effects of variable retention on growth.
- A core of treated and natural permanent sample plots will be measured on a 10-yr cycle.
- A light model has been developed to examine the impact of variable retention on yield and a moisture sub-model is being developed.

## Benefits to Society

Englewood Forest Operations will meet overall societal goals related to sustaining key social and ecological values, while harvesting the approved Annual Allowable Cut as required under the Forest Act.

Englewood Forest Operation demonstrates its commitment to these goals through Management and Forest Development and through the conduct of logging and other activities in accordance with approved plans and prescriptions. Through implementation of the Western Forest Strategy the company is committed to performance results of a higher standard than those required by law. The Forest Strategy includes, among other aspects, a transition to ecologically-based silviculture systems, increased old growth conservation, and expanded public consultation such as that conducted in writing this SFM Plan.

## Forest Recreation

One objective is to periodically revise recreational value ratings or conduct new inventories to incorporate changes in value perceptions or management guidelines.

**Consistent with MoFLNRO Recreation Management Guidelines and Standards, the Englewood Forest Operation's strategy is to:**

- Identify new, significant recreational attractions in the course of inventory or development work and protect them.
- Cooperate with government and authorized caving organizations to protect cave entrances and underground cave features and assist in the management of public access.
  - A recreation inventory was completed in May 1995.
  - A planning-level karst inventory was completed according to resource inventory standards committee (RISC) in March 2004.
  - Account for recreation in operational harvest plans and timber supply analyses.
  - A WFP Karst Management standard and Guidelines were implemented in April 2015.
  - A full LiDAR inventory was flown in 2016 and ready for use April 2017.

## Visual Landscape Management

Major visual landscape management issues in the DFA are associated with public travel corridors, settlements, parks and recreation use areas. The current visual landscape inventory was updated to RISC standards in January 2002. –

Forest harvesting and other operations will be managed to achieve established visual objectives. Englewood Forest Operation will work with government specialists to manage visual landscapes more efficiently – that is, to minimize impacts on timber supply while retaining visual values. This will include:

- Incorporating principles of landscape design in the planning process in areas of high visual sensitivity.
- Recognizing demand as well as supply when assessing appropriate standards for managing visual landscapes.
- Applying silviculture strategies to reduce the time to achieve visually effective green-up.

## **Road Access**

Recreation areas are accessed by industrial roads. The recreation use of these areas is considered during development of deactivation plans.

Strategies to address road access for recreation include:

- Identifying potential and known recreational use areas in the TFL.
- Maintaining established recreation areas.
- Working with recognized caving organizations to protect cave entrances and underground features.

Protect cave entrances and underground features by:

- Restricting falling and yarding.
  - Altering blasting or road building techniques.
  - Excluding sensitive areas from harvesting.
  - Using water management techniques.
  - Using slash management practices.
- Developing site-specific measures to address recreation concerns.
  - Seeking advice from the government where public comments indicate there are recreation concerns.
  - It may be necessary to adjust or relocate established trails to accommodate harvesting. Contact, seek input, and incorporate feedback from local recreation groups, individuals who have expressed an interest during the public review process, and the MoFR.
  - Rehabilitating significant trails post-harvest.

## **First Nations**

First Nations groups, living in communities adjacent to the Nimpkish DFA or having traditional territories that overlap areas of the DFA, are provided opportunities for forest management involvement and economic benefits through:

- Information sharing in planning and in communication of forestry practices and planned activities.
- Employment opportunities in forest management activities.

## **Public Information and Involvement**

In keeping with the expressed interest of the public in all aspects of forest resource inventory, management, and use, Englewood Forest Operations:

- Identifies and advises local and other involved public interest groups, local governments, First Nations, and interested individuals of opportunities for input to the various planning processes and solicits their feedback.
- Advertises and holds public information meetings to enable any member of the public to view and respond to Management Plan proposals and current performance.
- Financially supports and participates fully in activities of the Nimpkish Woodlands Advisory Committee (NWAC). NWAC is a facilitated, independent, broad-based community group formed with the express objectives of providing advice to Englewood Forest Operation on appropriate goals for sustainable forest management and of assessing and commenting on Englewood Forest Operation's performance with respect to those goals.

## Forest Monitoring & Research

The overall company objective in forest research is to obtain the knowledge to improve forest management and the conservation and protection of other forest resources and values. The strategy is to:

- Identify knowledge gaps and recommend basic and applied research needs;
- Engage with government, academic, and private agencies that have capacity and mandate to undertake applicable research;
- Support (with letters, in-kind resources, and leverage funding) research funding proposals for projects of particular or strategic interest to the DFA and WFP as a whole;
- Cooperate with research organizations in conducting basic and applied research; and
- Test and develop practicable applications and uses of published research that are relevant to Western Forest Products' management goals and responsibilities.

### Significant areas of research include:

- **Forest Ecology** – The objectives of the forest ecology research program are to determine the effects of management activities on forest ecosystems, to improve our ability to predict ecosystem response, and to develop biologically sound silviculture prescriptions. Some projects include Variable Retention Adaptive Management and Species at Risk (Northern Goshawk, Owl population monitoring)
- **Silviculture** – The silviculture research program focuses on examining silvicultural practices for regeneration and growth. Objectives of this research are to maintain and enhance timber supply where economically viable to do so. Various trials—some with over 20 years of monitoring—examine species selection, genetic gain for volume and pest tolerance, stock types, mechanical site preparation, vegetation control, and fertilization. Some projects include: Climate based seed transfer, Western red cedar genomic selection and western red cedar browse resistance.
- **Forest Growth and Yield & Light Detection and Ranging (LiDAR)** – The aim of this program is to quantify forest inventory and growth rates across the range of site conditions on the company's tenure. A recent focus has been to examine the impact of variable retention harvesting and edge effects on early establishment and growth. The company has invested in LiDAR to improve inventory estimates and aid in planning. This investment has been further employed to examine forest ecology knowledge gaps. Some projects include: LiDAR Enhanced Forest Inventory Project. Nesting habitat for the Marbled Murrelet using LiDAR.