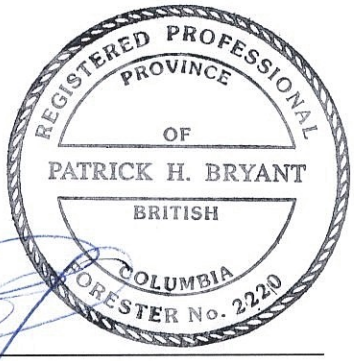
SUSTAINABLE FOREST MANAGEMENT PLAN 9

for

Nimpkish Defined Forest Area
and
Tree Farm Licence 37

January 1, 2006 to December 31, 2010

This plan was prepared under the supervision of:



Patrick Bryant, RPF, Strategic Planning Forester
Coastal Operations – Canadian Forest Products
#301-990 Cedar Street
Campbell River, British Columbia V9W 7Z8

Doug Regier, RPF, Operations Planning Forester
Coastal Operations – Canadian Forest Products
Englewood Logging Division
Woss, British Columbia V0N 3P0

And submitted on behalf of Canadian Forest Products Ltd. by:

Martin Buchanan, Manager of Forestry and Environment
Coastal Operations – Canadian Forest Products
Englewood Logging Division
Woss, British Columbia V0N 3P0

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PREFACE

Since the first Tree Farm Licence 37 licence agreement was awarded in 1960, Canfor has prepared eight management plans and two sustainable forest management plans. Management Plan 8 currently in effect (Management Plan 8 - Canfor 1998), was approved for a five-year period from January 1, 1998 to December 31, 2003 and then extended to December 31, 2005.

The purpose of this evolving set of documents is to periodically identify and submit to the provincial chief forester for approval, Canfor's management values and objectives, and strategies for achieving those objectives, for the timber and non-timber resources within the Nimpkish Valley Tree Farm Licence 37.

In general, this plan provides strategic direction across the management unit, as well as important linkages between higher-level plans and operational plans. Operations conducted under the Tree Farm License must be done in a manner that is consistent with the approved plan.

The format and content of this plan will meet the requirements to replace both the current Management Plan 8 and Canfor's revised sustainable forest management plan (Canfor, 2002), which was originally certified under the Canadian Standards Association Sustainable Forest Management System standard (CAN/CSA SFM Z809-96). Accordingly, this plan will be referred to as 'SFM plan 9'.

SFM plan 9 fulfils section 2.00 of the Tree Farm Licence 37 licence agreement dated March 1995, for the Nimpkish Tree Farm Licence 37 as well as an obligation outlined in section 35(d) of the Forest Act. This plan updates and builds upon eight preceding editions of management plans (or management and working plans) and two preceding editions of sustainable forest management plans.

Although this public document is intended to be useful to a wide variety of readers, emphasis is placed towards:

- *Employees and agents of Canadian Forest Products Ltd.*
- *Members of the Nimpkish Woodlands Advisory Committee public advisory group.*
- *Government agency representatives involved in the approval process.*

In 2002, the Canadian Standards Association announced a significant change to the standard for preparing a sustainable forest management plan under the Sustainable Forest Management System (CSA 2002). Canfor expects in adopting this new standard, further additions to this SFM plan 9 will be required to fully comply with the new standard. In addition, modifications will likely be required following the review and comment process with the Nimpkish Woodlands Advisory Committee, including First Nations, KPMG[1], Canfor's Registrar for Canadian Standards Association sustainable forest management certification, and the general public.

These changes and the completion of other plan components will be incorporated into the proposed SFM plan 9, due for submission by the end of August 2005.

[1] *KPMG Quality Registrar Inc. – Wholly owned subsidiary of KPMG LLP, a member firm of KPMG International, a Swiss association.*

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Martin Buchanan, Canadian Forest Products Ltd.

Patrick Bryant, RPF, Canadian Forest Products Ltd.

Colin Campbell, RPF, Canadian Forest Products Ltd.

John Deal, RPBio, RPF, Canadian Forest Products Ltd.

Keith Erikson, CGA, Canadian Forest Products Ltd.

Tyler Field, RPF, Canadian Forest Products Ltd.

Doug Folkins, RPF, Canadian Forest Products Ltd.

Glynnis Horel, PEng, Ostapowich Engineering Services Ltd.

Wanda Kuzenko, Canadian Forest Products Ltd.

Kevin Laird, RPF, Canadian Forest Products Ltd.

Todd Manning, RPBio, FIT, Manning, Cooper & Associates

Colin Mahony, FIT, Forest Ecosystem Solutions Ltd.

Antti Makitalo, RPF, Forest Ecosystem Solutions Ltd.

Wayne Matkoski, WRM Resource Consulting Ltd.

Doug Regier, RPF, Canadian Forest Products Ltd.

Nelson Scoullar, Canadian Forest Products Ltd.

Troy Wanner, Canadian Forest Products Ltd.

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1.0 INTRODUCTION

1.1 DESCRIPTION OF THE LICENCE/DEFINED FOREST AREA

For the purposes of this plan, Tree Farm Licence (TFL) 37, together with its associated Landscape Units (LUs), is considered the Defined Forest Area (DFA) and all comments, unless otherwise stated, pertain to this area.

The Nimpkish DFA includes the all lands within the Upper Nimpkish and Lower Nimpkish LUs. The Nimpkish DFA area encompasses 196,485 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 1).

Figure 1 Regional perspective of the Nimpkish DFA.

The Nimpkish DFA excludes private lands and other forestry tenures not associated with TFL 37. After water, roads and other non-forest and non-productive areas are removed (47,245 hectares), 80% of the Nimpkish DFA is considered productive forest. Further removals throughout the Nimpkish DFA for environmental and social considerations results in 96,965 hectares, less than half of the Nimpkish DFA, available for timber harvesting operations. A detailed breakdown of these areas is provided in the information package (Appendix III).

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

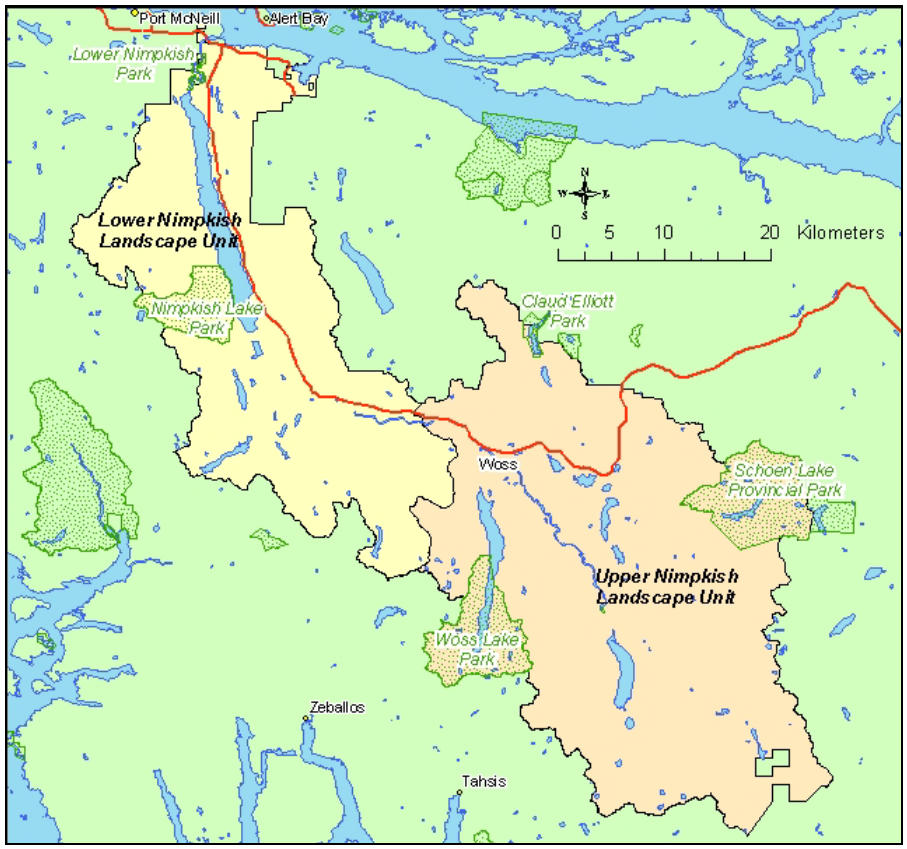

Figure 2 ***Canfor's Nimpkish DFA, including boundaries of the Lower and Upper Nimpkish LUs.***

Table 1 ***Biogeoclimatic ecosystems.***

BEC Subzone	BEC Variant		Approximate Elevation Range (m)		% Total Area
Alpine Tundra and Glacier	ATc		1,400	1,600	4%
Mountain Hemlock	MHmmp1	Parkland	1,200	1,400	19%
	MHmm1	Windward Moist Maritime	900	1,400	2%
Coastal Western Hemlock	CWHvm2	Montane Very Wet Maritime	600	1,000	24%
	CWHvm1	Submontane Very Wet Maritime	0	600	29%
	CWHmm1	Submontane Moist Maritime	450	700	10%
	CWHxm2	Very Dry Maritime	0	400	12%

Table 2 Major tree species.

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

Table 3 Landbase Summary of the Nimpkish Defined Forest Area [1].

Landscape Unit	BEC Variant	NPLB [2]	PLB [3]	NCLB [4]		THLB [5]	
		Hectares	Hectares	Hectares	% of PLB	Hectares	% of PLB
Lower Nimpkish (Low biodiversity emphasis)	CWHxm2	6,120	12,661	4,226	33%	8,435	67%
	CWHvm1	2,840	26,527	8,203	31%	18,324	69%
	CWHvm2	2,242	13,662	4,862	36%	8,800	64%
	MHmm1	3,093	8,126	5,576	69%	2,550	31%
	MHmmp	1,854	n/a [6]	0	n/a [6]	0	n/a [6]
	ATc	1,060	n/a [6]	0	n/a [6]	0	n/a [6]
Landscape Unit Subtotals		*17,244*	*17,208*	*60,977*	*22,867*		*38,110*
Upper Nimpkish (Intermediate biodiversity emphasis)	CWHxm2	750	4,998	1,690	34%	3,308	66%
	CWHmm1	4,272	14,614	3,985	27%	10,629	73%
	CWHvm1	2,384	24,630	9,177	37%	15,453	63%
	CWHvm2	4,462	26,983	9,741	36%	17,242	64%
	MHmm1	9,946	16,636	10,060	60%	6,576	40%
	MHmmp	2,523	n/a [6]	0	n/a [6]	0	n/a [6]
	ATc	6,205	n/a [6]	0	n/a [6]	0	n/a [6]
Landscape Unit Subtotals		*30,544*	*30,542*	*87,860*	*34,654*	*2*	*53,207*
Nimpkish DFA Totals		*47,788*	*47,750*	*148,837*	*57,520*	*0*	*91,316*

1. *This summary differs slightly from the timber supply analysis (Appendix III and IV) as new forest cover and BEC variant data for Schoen Lake Park became available. This was confirmed as of July 2005.*
2. *NPLB – Non-Productive Landbase (e.g., alpine, roads, rock, water, swamp - see Appendix III, page 10)*
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.*

http://wwwmirror2005.canfor.ca/sustainability/certification/csa.asp

1.1.1 Licence Holder

Canfor is a leading integrated forest products company based in Vancouver, British Columbia (BC). The company is the largest producer of softwood lumber and one of the largest producers of northern softwood kraft pulp in Canada. Canfor also produces kraft paper, plywood, remanufactured lumber products, oriented strand board (OSB), hardboard paneling and a range of specialized wood products, including baled fibre and fibre mat at 34 facilities located in BC, Alberta and Quebec.

Canfor has an annual production capability of approximately 5.2 billion board feet of lumber, 950 million square feet of plywood and OSB, 1.2 million tonnes of pulp, and 142,000 tonnes of kraft paper. Additionally, Canfor has approximately 13 million cubic metres of allowable annual cut (AAC) under its forest tenures, all of which will be ISO 14001 certified. Canfor is listed on the Toronto Stock Exchange. The main operating company is Canadian Forest Products Ltd., from which the name Canfor is derived.

Canfor employs 10,290 people - 8,100 directly, with an additional 2,190 through affiliated companies and contractors.

Canfor's forest operations in BC, Alberta, and Quebec are located almost exclusively on public lands held under long-term forest tenure agreements with the Province of BC. Table 4 lists Canfor's total AAC in replaceable tenures.

Table 4 Canfor's total allowable annual cut in replaceable tenures.

Location	Canfor's AAC
British Columbia	11,623,901 m 3
Alberta	883,825 m 3
Quebec	215,000 m 3

1.1.2 Management Responsibilities

Forest law, all relevant legislation, standards and procedures and the objectives established in HLPs are fundamental to the management practices and standards on the Nimpkish DFA. Constraints imposed by these references are considered within Canfor's objectives, options and procedures, as well as its strategies and standards.

The TFL agreement stipulates general requirements and specifications that must be addressed, but Canfor is not the only operator with forest management responsibilities within the Nimpkish DFA. BC Parks of the Ministry of Water, Land and Air Protection (MWLAP) and the BC Ministry of Forests (MoF) participate on the public advisory group for the Nimpkish DFA (see Section 3.4 and Objective 6.3 (a)).

BC Parks are responsible for developing and adhering to park management plans for those parks, or portions of parks, that are included within or adjacent to the Nimpkish DFA. Currently, only one park management plan, Schoen Lake Park, is available. These general management objectives are consistent with the objectives in this SFM Plan.

The MoF has overall authority for approvals of Canfor's operational plans and ensure Canfor's activities comply with provincial legal requirements. This is administered through the MoF's North Island – Central Coast (NICC) Forest District office.

Recently, the Forestry Revitalization Act (FRA – March 31, 2003) reallocated timber tenure within the Nimpkish DFA to the MoF's BC timber sales (BCTS) program (79,585 m^3/yr effective 2005). The harvesting and silviculture activities are currently administered through the MoF's Seaward-Tlasta Business Area, within the MoF's North Island, Central Coast (NICC) forest district. Although the BCTS management area has been identified within the Nimpkish DFA, Canfor has received no formal designation or removal from the TFL. Meanwhile, Canfor works with BCTS to conform to strategic and operational plans as well as the objectives of this SFM Plan.

The FRA also reallocated 45,600 m^3/yr of timber tenure to First Nations. For now, this will be implemented in 2006 through a Forest and Range Practices Agreement and a 5-year, non-replaceable timber licence, while the First Nations engage in treaty negotiations with the provincial and federal governments.

At this time, it is uncertain how these anticipated changes would affect the Nimpkish DFA. For instance, landbase may be formally and completely removed from Canfor's management, as well as the Nimpkish DFA. Consequently, some targets for indicators described below may require revision as these changes are realized.

1.1.3 History

TFL 37 was first awarded to Canfor on December 28, 1960. The most recent TFL 37 replacement came into effect on March 1, 2000. This licence is granted for a 25-year term and, subject to satisfactory levels of performance, will be replaced every five years with a new licence having a 25-year term. There have been no significant changes to Canfor's AAC since Working Plan 3 was approved in 1970 (see Figure 3).

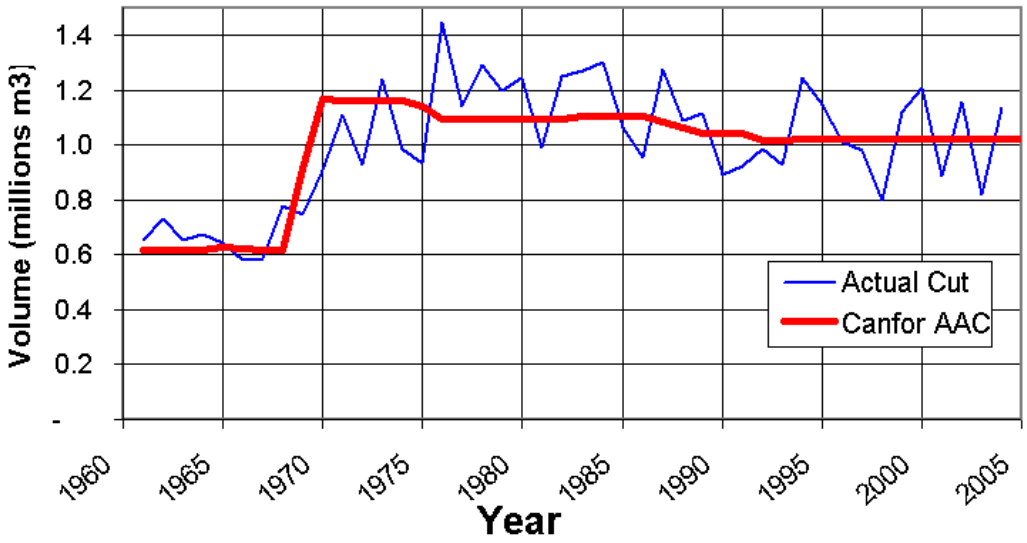

Figure 3 Harvesting performance relative to Canfor's allowable annual cut.

1.1.4 Schedule B Prorate

The Schedule B prorate is used to derive annual rent charges as well as annual contractor compliance volumes. It is the ratio of the mature standing volume of current timber harvesting landbase (THLB) for Schedule B lands over the THLB for all of the Nimpkish DFA. In the past, Canfor has based this on the timber productivity assigned to both the Schedule A (Private) and Schedule B (Crown) for THLB.

Table 5 shows the Schedule B AAC prorate for the entire TFL 37 is 0.896, whereas Canfor's portion calculates as 0.776. Eventually, as TLs within the TFL are completely reverted to Schedule B lands, only the Crown Grant lands will remain as Schedule A and the total prorate will increase to approximately 0.960. Of course, this assumes no further changes to the forest tenure system.

Table 5 Schedule B prorate.

Tenure	Mature Standing Volume [1] ('000s m3)	% Mature Standing Volume
Schedule A Land Subtotal	3,800 m3	10.4%
BCTS	2,904 m3	8.0%
First Nations	1,460 m3	4.0%
Canfor	28,347 m3	77.6%
Schedule B Land Subtotal	32,711 m3	89.6%
Total	36,511 m3	100.0%

1 Only considers timber volume within the THLB

1.2 PROGRESS ON COMMITMENTS

Over the MP 8 planning period, management of the Nimpkish DFA was influenced by the following external initiatives:

- *The MoF replaced the previous TFL 37 dated March 1, 1995, in March 1, 2000.*
- *Cabinet passed a Higher Level Plan (HLP) order that establishes Resource Management Zones and objectives within the area covered by the VILUP.*
- *The provincial government amended the Forest Act to enable: 1) a trial program to establish AAC in hectares per year, and 2) provides the provincial Chief Forester with the authority to extend the deadline for determining AACs for TFLs by up to five years.*
- *The MoF initiated a Land Use Planning process to establish Old Growth Management Areas (OGMA)*
- *The MoF initiated the Identified Wildlife Management Strategy (IWMS) to establish Wildlife Habitat Areas (WHA).*
- *Cabinet significantly revised forest legislation in BC by passing the Forest Practices Range Act (FRPA) and its associated regulations, to replace the Forest Practices Code (FPC).*

During the MP 8 planning period Canfor also initiated, or became involved in, several initiatives that may have influenced its management of the Nimpkish DFA:

- *All of Canfor's Woodlands Operations, including the Nimpkish DFA, received registration of its Environmental Management System under the International Organization of Standards (ISO) 14001.*
- *Canfor's TFL 37 received registration under the Canadian Standards Association's CAN/CSA Z809-96 Sustainable Forest Management Standards for the Nimpkish DFA.*
- *Canfor released its Forestry Principles, providing a foundation for forest management strategies, policies and operating procedures. An ecosystem-based implementation plan was prepared, which considers the Nimpkish DFA in the context of strategic direction detailed in the VILUP HLP order.*
- *The community of Woss was formally incorporated within the Mount Waddington Regional District. This removed approximately 64 hectares from the TFL and Timber Licence (TL) TO079.*

SFM plan 9 addresses how Canfor has adapted to these initiatives intended to address economic, social and environmental change.

The only commitment still in effect concerns expectations expressed in the provincial Chief Forester's AAC Rationale for MP8. This involves examining potential management strategies to provide flexibility in accessing timber supply and will be addressed in the next Timber Supply Analysis.

2.0 SUSTAINABLE FOREST MANAGEMENT

2.1 MANAGEMENT PRINCIPLES

Canfor adopts an adaptive management approach in the short-term to achieve long-term goals of sustainable forest management (SFM). This incorporates the experience gained from the results of previous management methods and actions into updated objectives and strategies. The key to adaptive management is making strategies and assumptions explicit so they can be measured, monitored and adjusted for future management strategies.

Canfor has defined the guiding vision, policies and principles for the company in the following documents: Mission Statement, Environment Policy and Forestry Principles (see Appendix I). These principles and commitments are used to enable and guide the development of this SFM plan 9.

2.1.1 Canfor Mission Statement

Canfor's Mission (Canfor 1990) statement was developed to provide a clear company vision and an overall direction for guiding personnel in their activities. It also helps employees focus on the core values that the company believes in.

2.1.2 Environmental Policy

Canfor's Environmental Policy (Canfor 2005) establishes its commitment to responsible stewardship of the environment throughout its operations. This policy also provides a framework for setting and managing environmental objectives and targets.

2.1.3 Canfor's Forestry Principles

Canfor's Forestry Principles (Canfor 1999) is a corporate initiative that sets the direction for future strategic and operational plans. The forestry principles outline a broad approach to achieve its forestry goals:

- *Canfor will be a global leader in the profitable production of forest products from sustainably managed forests.*
- *Canfor is committed to the conservation of soil, water and biodiversity and to the maintenance of ecosystem productivity in the forest areas where it operates.*
- *Canfor will use forest ecosystem management that encompasses entire forest landscapes and that forecasts the future condition of forests for 100 years or more.*

The management systems developed, including certification standards, will maintain the long-term health of forest ecosystems, while providing ecological, economic and social opportunities for the benefit of present and future generations.

Canfor's implementation of the forestry principles for the Nimpkish DFA are specified in Canfor's *Forestry Principles Implementation Plan: Coast Region* (Canfor 2002) and also reflected in this SFM plan 9.

2.2 FOREST MANAGEMENT SYSTEMS CERTIFICATION

2.2.1 ISO Environmental Management System

As a preparatory step to achieving SFM certification, Canfor developed an environmental management system (EMS) for all of the company's woodlands operations. In December 1999 the EMS was certified to the ISO 14001 standard developed by the International Organization for Standardization. Canfor's EMS provides a platform on which to build the SFM elements required to meet the CSA standard.

2.2.2 CSA Sustainable Forestry System

In July 1999, Canfor formally announced its commitment to seek SFM certification of the company's TFL 37 under the CSA SFM system standard CAN/CSA-Z809-96. Canfor successfully attained certification in August 2000, and was subsequently recertified in November 2002.

The purpose of the CSA standard is to describe the components and performance objectives of a SFM system. This system ensures that quantifiable management objectives are developed for the six criteria SFM selected by the Canadian Council of Forest Ministers (CCFM 1996).

2.2.3 Forest Management System (FMS)

Between the spring of 2004 and early 2005, Canfor worked to integrate both the EMS and SFM System into one integrated management system. In June 2005, a Forest Management System Manual was formally implemented.

3.0 PLANNING

3.1 HIGHER LEVEL PLANS

3.1.1 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 (PAs) throughout the area, this plan provides strategic direction, objectives and strategies for non-forest uses.

In December 2000 the VILUP, HLP order came into effect, establishing Resource Management Zones and objectives within the area covered by the VILUP (see Figure 4). Canfor incorporates the strategic direction of the HLP order into its strategic, tactical/development and operational planning levels.

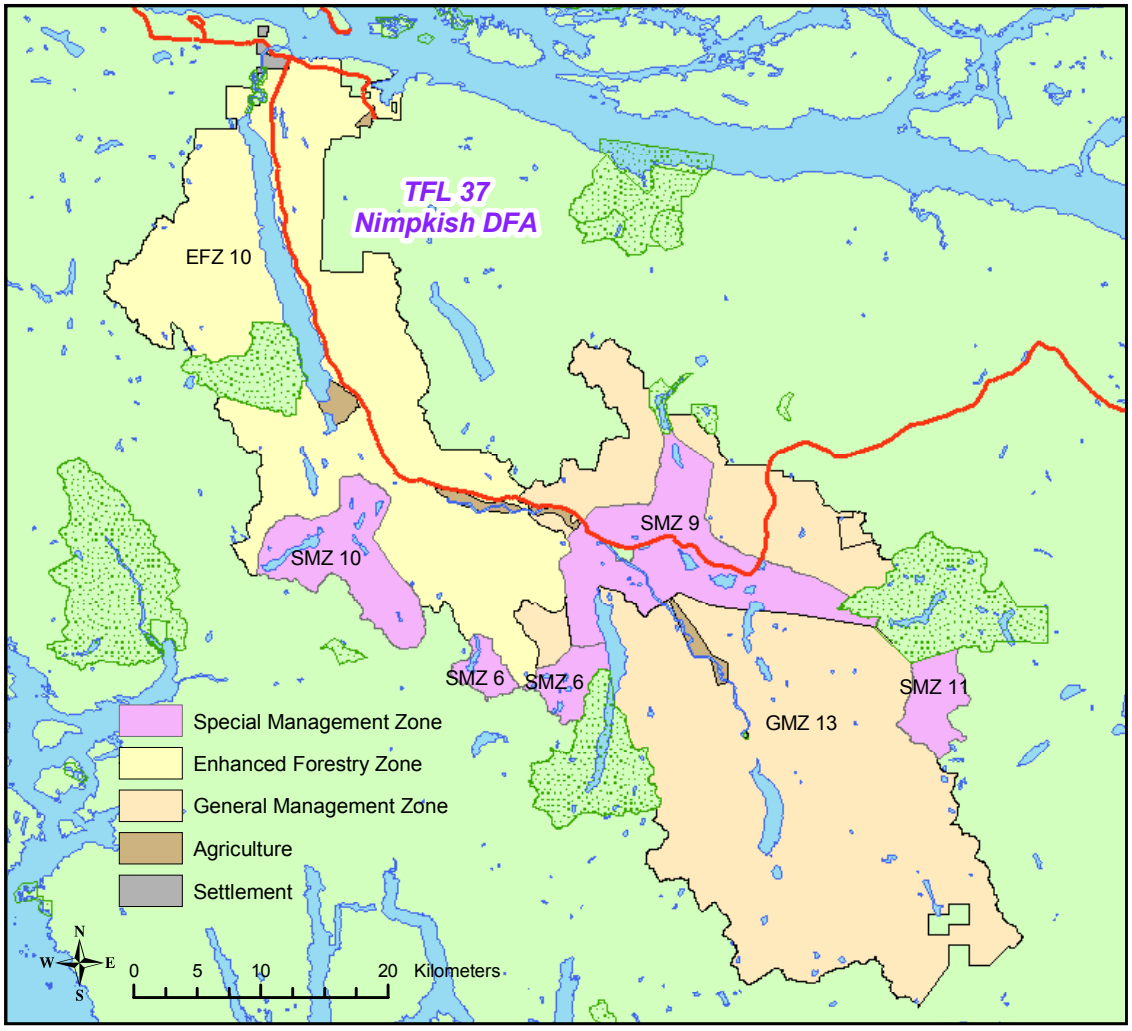

Figure 4 Resource Management Zones.

3.1.2 Lower and Upper Nimpkish Landscape Unit Plans

The Ministry of Sustainable Resource Management (MSRM) is mandated to establish strategic objectives on provincial Crown lands to manage a wide range of resource values, including biodiversity. MSRM will establish these objectives under a new framework referred to as Sustainable Resource Management planning (SRM planning). SRM planning is a consolidated approach to planning at the landscape level that will allow MSRM to implement land use plans, identify economic opportunities, design efficient, sustainable development and conserve environmental values.

MSRM recently refined LU boundaries and in June 2004, legally established two LUs 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.

In a joint effort with Canfor, MSRM is currently preparing a Landscape Unit Plan (LUP) for the Lower and Upper Nimpkish LUs. The draft biodiversity chapter of this plan was advertised for review and comment in May 2005 with final approval expected in September 2005. This plan includes 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 the proposed OGMAs.

The objectives approved under the LUP will ultimately guide some Canfor planning initiatives. SFM plan 9 already considers the draft objectives in order to maintain continuity as these plans are reviewed and approved.

3.2 RESOURCE INVENTORIES

Canfor has progressively accumulated a variety of resource inventories since it was awarded TFL 37. These are periodically updated as needed to meet strategic or operational planning needs. Key inventories are briefly discussed below while additional detail is provided in the information package (Appendix III).

Forest Cover

Canfor recently completed several internal and standard projects focused on improving forest cover information within TFL 37. These projects included:

- *Photo Interpretation (Phase I) – Classification completed in June 1998 to MoF 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.*

Recreation

The most recent recreation inventory was completed in May 1995 to the MoF 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, Canfor completed a multi-year inventory project that combined terrain stability mapping (TSM) and terrestrial ecosystem mapping (TEM). This project was conducted according to RISC standard.

Operability

In October 2000, Canfor completed a project to refine its spatial assignment of physical operability. 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.

Fisheries

Canfor completed classification and field-checks of its strategic stream network 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 identified by the Committee on the Status of Endangered Wildlife In Canada (COSEWIC);*
- *Species included in the BC IWMS (MWLAP, 2004);*
- *Forest-dependent species listed by the BC Conservation Data Centre (CDC);*

The species summarized in Table 6 from the lists above are either known or suspected of being on the Nimpkish DFA.

Table 6 Vertebrate species of potential management concern.

Common Name	Scientific Name	COSEWIC[1]	BC CDC List 2004 [2]	IWMS [3]
AMPHIBIANS				
Red-Legged Frog	*Rana aurora*	Special Concern	Blue	2004
BIRDS				
Pacific Great Blue Heron	*Ardea herodias fannini*	Special Concern	Blue	2004
'Queen Charlotte' Goshawk	*Accipiter gentilis laingi*	Threatened	Red	2004
'Vancouver Island' White-tailed Ptarmigan	*Lagopus leucurus saxatilis*		Blue	
Marbled Murrelet	*Brachyramphus marmoratus*	Threatened	Red	2004
Western Screech-owl	*Megascops kennicottii kennicottii*	Special Concern	Blue	
Northern Pygmy-owl	*Glaucidium gnoma swarthi*	Not Assessed	Blue	
MAMMALS				
Common Water Shrew, brooksi subspecies	*Sorex palustris brooksi*		Red	
Keen's Long-eared Bat	*Myotis keenii*	Data Deficient	Red	2004
Wolverine	*Gulo gulo vancouverensis*	Threatened	Red	2004

1 Committee on the Status of Endangered Wildlife in Canada: www.speciesatrisk.gc.ca
2 BC Conservation Data Centre's Species and Ecosystem Explorer http://srmapps.gov.bc.ca/apps/eswp/
3 IWMS - Identified Wildlife Management Strategy

Canfor's 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 (COSEWIC endangered, threatened and special concern);*
- *Species on the Provincial IWMS list;*
- *Provincially-listed forest-dependent species not included in the IWMS;*
- *Species of local interest*

Plants and Plant Communities

Plants and plant communities of potential management interest that may occur within BEC site series the Nimpkish DFA include those forest-dependent species and communities identified by the BC Conservation Data Centre (CDC).

Table 7 Plant and plant associations of potential management concern[1]

Common Name	BEC Site Series	BC CDC
PLANTS[2]		
White wintergreen (*Pyrola elliptica*)		Blue
PLANT ASSOCIATIONS[3]		
Sitka spruce / salmonberry Very Dry Maritime	CWHxm2/08	Red
Sitka spruce / salmonberry Very Wet Maritime	CWHvm1/09	Red
Douglas-fir - lodgepole pine / reindeer lichens	CWHxm2/02	Red
Western redcedar / three-leaved foamflower Very Dry Maritime	CWHxm2/07	Red
Western hemlock - Douglas-fir / Oregon beaked-moss	CWHxm2/01	Red
Western hemlock - western redcedar / deer fern	CWHxm2/06	Red
Lodgepole pine / peat-mosses Very Dry Maritime	CWHxm2/11	Blue
Black cottonwood / red-osier dogwood	CWHmm1/09	Blue
Black cottonwood / red-osier dogwood	CWHvm1/10	Blue
Black cottonwood / red-osier dogwood	CWHxm2/09	Blue
Douglas-fir - western hemlock / salal Dry Maritime	CWHxm2/03	Blue
Western redcedar - Sitka spruce / skunk cabbage	CWHmm1/12	Blue
Western redcedar - Sitka spruce / skunk cabbage	CWHxm2/12	Blue
Western redcedar / sword fern Very Dry Maritime	CWHxm2/05	Blue
Western redcedar - western hemlock / sword fern	CWHvm1/04	Blue
Western redcedar - western hemlock / sword fern	CWHvm2/04	Blue

1 BC Conservation Data Centre Provincial Rare Plants and Plant Associations List (BC Species and Ecosystem Explorer, June 2005: http://srmapps.gov.bc.ca/apps/eswp/)
2 Only plants with probable or higher likelihood of occurrence within forested ecosystems are listed here.
3 Only plant associations with structural stages 6 and 7 (mature and old forested stands) are considered here.

3.3 ECOSYSTEM MANAGEMENT UNITS

Ecosystem management will be implemented to be consistent with the VILUP HLP objectives. There are two general ecological zones which are defined according to the historic natural disturbance processes which occur there: i) the fire adapted drier and lower elevation CWHxm2 and CWHmm1 BEC subzones; and ii) the gap-dynamic adapted wetter and mid to high elevation CWHvm1, CWHvm2 and MHmm1 subzones.

The VILUP identifies three Resource Management Zones (RMZ) on the Nimpkish DFA (see Figure 4). These are: i) Enhanced Forestry Zone (EFZ); ii) General Management Zone (GMZ); and iii) Special Management Zone (SMZ). Detailed information about RMZs can be found in section 4.3 of the Vancouver Island Summary Land Use Plan.

Based on these RMZs, the Nimpkish DFA is divided into six Ecosystem Management Units (EMU), which are stratified according to the corresponding RMZ designation and the inherent natural disturbance process (fire or gap-dynamic). These are EFZ_fire, EFZ_gap dynamic, GMZ_fire, GMZ_gap dynamic, SMZ_fire, and SMZ_gap dynamic, and are shown in Figure 5.

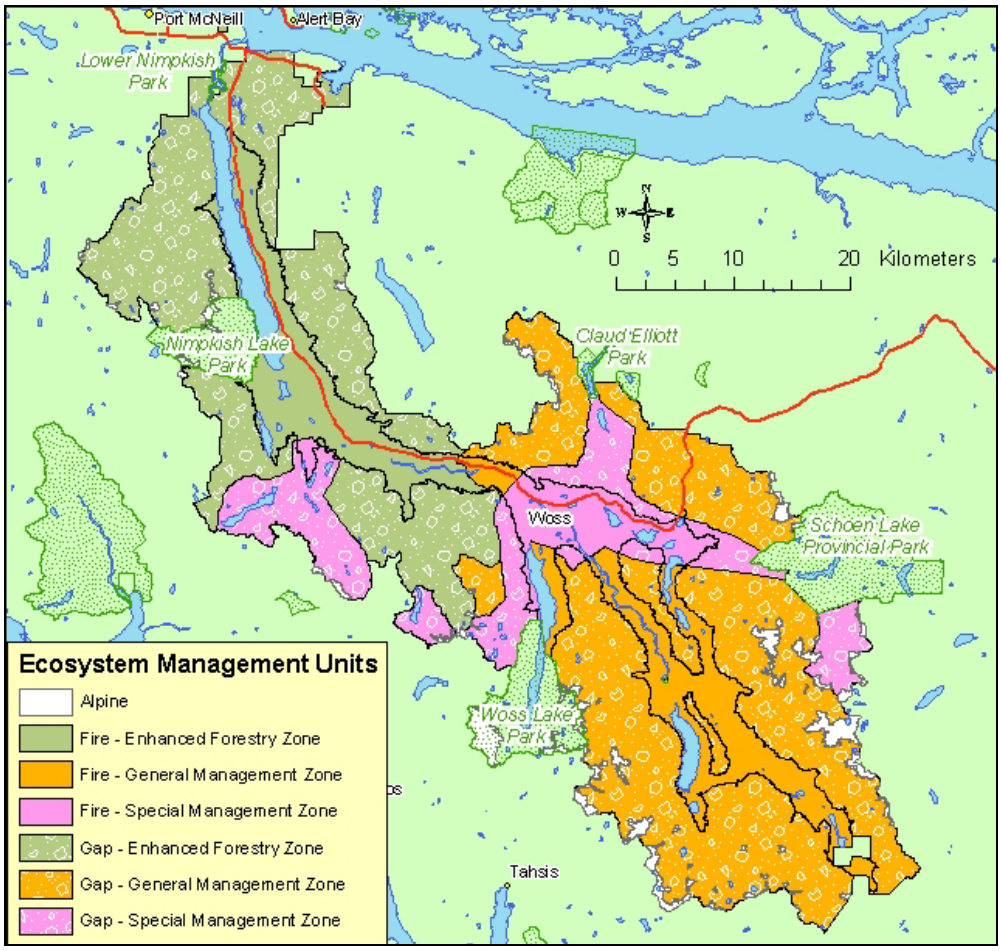

Figure 5 Ecosystem management units.

3.4 NIMPKISH WOODLANDS ADVISORY COMMITTEE

As part of the SFM certification process, local people and others who are affected by, or have an interest in, the Nimpkish DFA were identified and invited to participate. These people may include representatives of the three local First Nations, local, regional, provincial and federal governments, wildlife interests, labour/worker interests, local contractors, recreation, tourism, value-added, and environmental interests. Thus, the Nimpkish Woodlands Advisory Committee (NWAC) was formed for the primary purpose of providing input in identifying local values, objectives, indicators and targets to the critical elements of SFM.

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

4.0 VALUES AND OBJECTIVES

Past TFL 37 Management Plans discussed specifications and strategies for management activities such as Forest Fire, Forest Health, Silviculture and Roads. Under the current FRPA legislation and results-based concepts, the details of these specifications and strategies are provided in the TFL agreement and operational plans such as the Forest Development Plan (FDP) or Forest Stewardship Plan (FSP). This document, and this section in particular, focuses on the values and their respective objectives.

Objectives are a broad statement describing a desired future state or condition for a value. The 39 Objectives discussed below address values considered to be important in relation to a CSA SFM element or other locally identified elements. Each objective is specifically addressed through one or more indicators, which are variables that measure or describe the state or condition of a value. Each indicator is then addressed through targets, which are specific statements describing a desired future state or condition of an indicator. In the unlikely event that some significant, landscape-level natural disturbance shifts various indicators far beyond the acceptable variances for current targets, a new set of strategies will be developed.

The process for considering what is important to this process is currently underway and involves all stakeholders identified for the Nimpkish DFA through the NWAC. The 55 indicators described below represent the current variables but as this approval process is dynamic, some indicators will likely change. Consequently, this draft SFM plan focuses on the discussion for values and objectives, and where appropriate, discusses indicator currently being considered in more detail. The proposed SFM plan, ratified by the NWAC, will include detailed descriptions of each indicator.

Criterion 1. Conserve Biological Diversity

This criterion seeks to conserve biological diversity by maintaining integrity, function and diversity of living organisms and the complexes of which they are a part. Specific elements include ecosystem diversity, species diversity, genetic diversity, protected areas and sites of special biological significance. Specific values identified are: a) a diverse landscape, b) native species diversity, c) genetic diversity, and d) protected areas and sites of biological significance.

Value 1.1 A Diverse Landscape

Biological diversity is promoted by maintaining a diverse landscape. Seven indicators are used to assess the objective developed for this value to conserve ecosystem diversity.

Objective 1.1 (a) Manage forests to conserve ecosystem diversity.

This objective is primarily realized through indicators that address ecosystem representation in the non-harvestable landbase (NHLB), forest interior condition and old growth forest management. Forest ecosystems retained within the harvestable landbase at a stand level also contribute to conserve ecosystem diversity. Accordingly, indicators that address wildlife tree retention, internal patch retention, single tree retention and forest influence add towards addressing this objective.

Ecosystems in the Non-Harvestable Forest Landbase

	Indicator	*Target*	*Acceptable Variance*
1.	Percent non-harvestable forest by ecosystem groups.	Report the percent non-harvestable forest by ecosystem groups every 5 years.	Not applicable.

JUSTIFICATION – Maintaining adequate representation of ecosystems across a landbase is becoming increasingly important for ensuring forest sustainability at local and regional scales. In this context, ecosystems are "coarse-scale" surrogates for primary characteristics of ecosystem function (Sutherland et. al. 2003). A primary component

of broad-scale ecological monitoring of management practices is the examination of how well ecologically distinct habitat types are represented in non- and lightly-harvestable areas of the landbase (Huggard 2001).

An essential component for analyzing this indicator is defining the productive landbase into the NHLB and HLB. A well-represented NHLB is most likely to retain the widest range of structural and functional attributes of ecosystems. NHLB includes productive, forested lands that are greater than 90% constrained from harvest due to some regulatory or physical impediment to harvesting. Within a range of targets, this indicator helps identify options for changing management strategies. However, NHLB representation cannot be directly related to ecological risk without considering ecosystem rarity, interior NHLB, and comparison between the attributes of the NHLB and HLB (harvestable landbase).

Another essential component for this indicator is clustering mapped ecosystems into a manageable number of groups that considers ecosystem abundance and sensitive plant associations. Widespread ecosystems are likely to be less sensitive to low levels of representation than uncommon ecosystems. Moreover, uncommon ecosystems are thought to require higher representation in the NHLB to maintain ecological risk within acceptable levels (Wilson 2003). Representation and abundance are therefore both important in assessing ecological risk and assigning priorities for ecosystem management.

Ecosystem representation also ensures that poorly known species and ecological functions are maintained. A coarse-filter approach to maintain native forest botanical species and address the rare plant species and plant associations listed in Table 7 is a good start with adequate ecosystem mapping but this must also be managed at a finer scale. Similarly, several species listed in Table 6 can be effectively managed at a coarse scale. For example:

- *White-tailed Ptarmigan are known to use high elevation forest (960m – 1889m) as cover during the winter (IWMS 2004). At the coarse scale, 63% of the productive MHmm1 forest and 36% of the productive CWHvm2 forest are within the NCLB (Table 3).*
- *The common water shrew's habitat includes streams and riparian management areas that are within the NHLB.*
- *Red-legged frog terrestrial habitat is difficult to classify (IWMS 2004). At the coarse scale, approximately 1/3 of the low elevation (CWHxm2, mm1, and vm1) productive forest is within the NCLB (Table 3).*

Canfor continues to refine its ecosystem representation analysis as the basis for coarse-filter conservation of biological diversity. As a basis for establishing management priorities for specific ecosystems, the proposed approach identifies key variables synthesized into an index of ecological risk:

- *Quantity Variables (representation in the NHLB; ecosystem group abundance)*
- *Quality Variables (forest interior in the NHLB)*
- *Certainty Variables (spatial accuracy of ecosystem mapping and the NHLB; flexibility of the NHLB; representation in lightly-managed HLB)*

For now, Canfor has assigned preliminary targets to priority ecosystem groups, which are set to attain at least 15% NHLB representation or 30% if the ecosystem group involves a red-or blue-listed plant association. Furthermore, Canfor actively manages related SFM indicators such as activities in protected and biologically significant areas (see indicator 17 on page 44) and rare plants and plant associations (see indicator 18 on page 46) that focus on consistency with established objectives and management practices.

DETAILS – This indicator is measured through a spatial analysis as the proportion of the productive forest area for each ecosystem group located within the NHLB. Ecosystem representation results are compiled as follows:

Calculation	**% ER $_{NHLB}$ = ER $_{NHLB}$ / HA**	
Variables	% ER $_{NHLB}$	Percent ecosystem representation within the NHLB[1].
	ER $_{NHLB}$	Total productive forest area of the ecosystem group[2] within the NHLB.
	HA	Total productive forest area of the ecosystem group[2].
Notes	*1*	*For this exercise, NHLB is defined according to Sutherland et.al. 2003.*
	2	*An ecosystem group is one or more site series of relatively similar plant associations characteristics that also consider ecosystem abundance and sensitive plant associations*

CURRENT STATUS –Canfor is contributing to an analysis applied to all of Vancouver Island, that uses an accepted approach for assessing regional ecosystem representation in the NHLB (Sutherland et. al. 2003). Note that for this exercise, only areas that are spatially explicit can be used, so definitions and areas of the NHLB vary slightly from those used in the Timber Supply Analysis (see Appendices III and IV).

Meanwhile, using the same approach, Canfor conducted an ecosystem representation analysis for the Nimpkish DFA. Table 8 indicates that nine of the thirty ecosystem groups do not meet the minimum thresholds that Canfor sets (indicated where priority targets are listed for ecosystem representation within the NHLB).

STRATEGY AND IMPLEMENTATION SCHEDULE – Rather than establishing thresholds for all ecosystem groups, Canfor manages ecosystem representation through a continual improvement process, where ecosystems with highest ecological risk are addressed first. The main considerations in prioritizing ecosystem groups are the:

- *relative ecological risk of ecosystems within the Nimpkish DFA*
- *proportion of the ecosystem located outside the DFA, and*
- *costs and opportunities of management necessary for the ecosystem.*

For identified ecosystem groups, planners will consider appropriate strategies in assigning areas for future retention. Linked to the key variables discussed in the justification section above, the following management actions are being implemented to reduce the relative ecological risk in priority ecosystems:

- *Prioritize specific high-risk ecosystems as anchors for WTPs in mature and old stands, while increasing their size to at least 15% of the harvest area for the cutblock (increases quantity);*
- *Establish or reallocate reserves in high-risk ecosystems (increases quantity);*
- *Establish reserves adjacent to high-risk ecosystems in order to increase the amount of interior NHLB (increases quality);*
- *Fill gaps in terrestrial ecosystem mapping of the DFA (increases certainty); and*
- *Improve the spatial accuracy of the NHLB (increases certainty).*

MONITORING - As the NHLB is established for the long term, little monitoring will be required. Therefore, this indicator is summarized from ecosystem representation analyses done in concert with timber supply analyses every 5 to 10 years. Significant changes to the regulatory, physical or structural nature of local or regional landbase may necessitate a reassessment and adjustment of the regional targets relative to the Nimpkish DFA.

FORECASTING – The NHLB is assumed to remain through the long term (300 years) because of the long time intervals between stand initiating events in Natural Disturbance Types (NDT) 1 and 2 forests. Also, Canfor's fire control and forest health measures are reducing the frequency of catastrophic events that could affect forests within the NHLB. Consequently, further forecasting is not a priority. Rather, ecosystem representation in the NHLB is considered in concert with the information package and timber supply analysis for SFM plan 9 (Appendix III and IV). Meanwhile, Canfor will explore spatial tools that will forecast priority areas for conserving biodiversity over time.

Table 8 Indicator results for ecosystems in the non-harvestable forest landbase [1].

Site Group	#	Ecosystem Group	BEC Site Series[2]					Productive Area (ha)	Relative Abund. [3]	Eco. Rep. Within the NHLB	% NHLB >50 m from HLB [4]	% NHLB >200 m from HLB [4]	Priority Targets			
			CWHxm2	CWHmm1	CWHvm1	CWHvm2	MHmm1						Eco. Rep. Within the NHLB	Revised WTP Target[5]	Consider WTP Buffer[5]	Rare Plant Pot'l [6]
Dry Forest	1	FdPl – Cladina	02					531	3%	71%	40%	6%				
	2	FdHw – Salal	03	02				4,286	13%	23%	54%	22%	≥30%	≥15%		xm2/03
	3	HwCw – Salal		03	03	03		24,717	23%	36%	62%	30%				vm2/03
	4	HwPl – Cladina			02	02		1,934	2%	82%	59%	22%				
	5	CwHw – Swordfern		04	04	04		7	0%	28%	3%	0%	≥30%	≥15%	Yes	
	6	BaHm – Oakfern					03	114	0%	58%	34%	20%				
	7	HmBa – Mountain-heather					02	8,521	31%	94%	73%	29%				
Zonal	8	HwFd – Kindbergia	01					8,499	41%	19%	51%	19%	≥30%	≥15%		xm2/01
	9	HwBa – Pipecleaner moss		01				8,298	55%	11%	32%	9%	≥15%	≥15%		
	10	HwBa – Blueberry			01	01		47,521	51%	21%	56%	25%				vm2/01
	11	HmBa – Blueberry					01	11,594	45%	30%	63%	29%				
Salal	12	HwBa – Blueberry/salal phase			01s	01s		1,405	2%	12%	19%	0%	≥15%	≥15%	Yes	
Moist-Poor	13	Pl – Sphagnum	11	11	13	10		336	0%	92%	27%	3%			Yes	
	14	CwSs – Skunk cabbage	12	12	14	11		1,464	1%	39%	41%	11%				
	15	CwYc – Goldthread			12	09		619	1%	20%	28%	1%			Yes	
	16	HmYc – Deer cabbage					06	76	0%	79%	50%	0%				
	17	YcHm - Hellebore					07	2,725	10%	74%	53%	9%				
	18	HmYc - Sphagnum					08	860	3%	100%	60%	11%				
	19	YcHm – Skunk cabbage					09	1,372	4%	98%	58%	11%				
	20	HwBa – Deer fern/salal phase			06s	06s		224	0%	12%	16%	0%	≥15%	≥15%	Yes	
Moist-Rich	21	HwBa – Deer fern		06	06	06		8,855	8%	25%	42%	17%				
	22	HwCw – Deer fern	06					663	2%	25%	51%	16%	≥30%	≥15%		
	23	Cw – Foamflower	07					932	5%	32%	25%	8%			Yes	xm2/07
	24	Cw – Swordfern	05					1,805	10%	24%	50%	27%	≥30%	≥15%		xm2/05
	25	BaCw – Foamflower		05	05	05		5,282	5%	22%	38%	22%				
	26	BaCw – Salmonberry		07	07	07		5,984	6%	36%	37%	16%				vm2/07
	27	BaHm – Twistedstalk					05	828	3%	37%	66%	42%				
	28	HmBa - Bramble					04	266	1%	13%	20%	16%	≥15%	≥15%	Yes	
Flood-plain	29	Ss – Salmonberry	08	08	09			1,025	1%	63%	40%	5%				
	30	Act – Red-osier dogwood	09	09	10			384	0%	58%	33%	3%				
		Nimpkish DFA Average								32%	57%	23%				

1 *Summarized from an updated ecosystem representation analysis in August 2005.*
2 *Red- and Blue-Listed Plant Associations (see Table 7) are shaded accordingly. Site series with potential for rare plants (see Table 7 - White Wintergreen) are underlined accordingly.*
3 *Relative abundance is the area of the ecosystem group divided by the area of the variants in which it occurs in Nimpkish DFA.*
4 *HLB – Harvestable Landbase.*
5 *Revised WTP targets and WTP buffers for increasing interior forest representation are only required for stands with mature and old forests >140 years (structural stages 6 and7).*
6 *These strategies are considered for ecosystem groups that Canfor considers particularly sensitive with respect to ecosystem representation, forest influence or where rare plants and plant associations may be present.*

Forest Interior in the Non-Harvestable Forest Landbase

	Indicator	*Target*	*Acceptable Variance*
2.	Percent forest interior in the non-harvestable forest by BEC variant within LUs.	Report the percent forest interior in the non-harvestable forest every 5 years.	Not applicable.

JUSTIFICATION – Forest interior is generally defined as the portion of the forest that is not influenced by edge effects (Von Sacken 1998). An edge is the interface between two distinct habitats such as a clearcut and old growth. Edge effects are the diverse phenomena that occur in the area affected by the meeting of two habitats. Different edge effects will penetrate into the forest to varying distances, depending on the variable measured. The depth of the edge influence depends on the type of vegetation along the edge (shrubs versus trees), vegetation height, edge type (abrupt versus feathered), orientation, and weather conditions (Kremsater 1997).

Forest interior is a coarse-filter approach that provides important habitat for a number of organisms that are not typically found near forest edges. For example, the red-breasted nuthatch and brown creeper are area-sensitive forest birds that may require forest interior habitat. Therefore, forest interior representation is an appropriate indicator of biological richness and of habitat elements required by species. Within a range of targets, this indicator helps identify options for changing management strategies.

DETAILS – This indicator is measured through a spatial analysis as the total area within both a 50- and a 200-metre internal buffer of the NHLB. Forest interior results are compiled as follows:

Calculation	**% FINT $_{NHLB}$ = FINT $_{NHLB}$ / HA $_{NHLB}$**	
Variables	% FINT $_{NHLB}$	Percent forest interior within the NHLB[1] by ecosystem group[2].
	FINT $_{NHLB}$	Total area in the NHLB within 50m and 200m from the HLB by ecosystem group[2] (i.e., internal buffers).
	HA $_{NHLB}$	Total area within the NHLB by ecosystem group[2].
Notes	*1 For this exercise, NHLB is defined according to Sutherland et.al. 2003.* *2 An ecosystem group is one or more site series of relatively similar plant associations characteristics that also consider ecosystem abundance and sensitive plant associations*	

CURRENT STATUS – Canfor is contributing to an analysis applied to all of Vancouver Island, that uses an accepted approach for assessing regional ecosystem representation, including forest interior representation, in the NHLB (Sutherland et. al. 2003). Note that for this exercise, only areas that are spatially explicit can be used, so definitions and areas of the NHLB vary slightly from those used in the Timber Supply Analysis (see Appendices III and IV).

Meanwhile, using the same approach, Canfor conducted an ecosystem representation analysis that considered forest interior. Table 8 indicates that seven of the thirty ecosystem groups do not meet a minimum threshold of 30% for NHLB representation of forest interior greater than 50 m from the HLB (indicated where priority targets for WTP buffers are noted for consideration). In fact, the actual forest interior expands and contracts as cutblocks around NHLB are harvested and regenerated. These figures then, represent the minimum level of forest interior available throughout the foreseeable planning horizon.

STRATEGY AND IMPLEMENTATION SCHEDULE – Forest interior representation within the NHLB is managed in concert with initiatives discussed under indicator 1 (percent non-harvestable forest by ecosystem groups) and its associated target on page 15. Priority ecosystem groups are identified to improve representation and planners will

consider appropriate strategies, where possible. For example, buffers adjacent to these ecosystem groups may be retained to increase the amount of interior NHLB. Whereas, deeper forest interior, greater than 200 metres from the harvestable landbase, may be addressed along with other landscape-level designations for habitat or areas requiring special management.

MONITORING - As the NHLB is established for the long term, little monitoring will be required. Therefore, this indicator will be summarized from ecosystem representation analyses done in concert with timber supply analyses done every 5 to 10 years. Significant changes to the regulatory, physical or structural nature of local or regional landbase may necessitate a reassessment and adjustment of the regional targets relative to the Nimpkish DFA.

FORECASTING - The NHLB is assumed to remain through the long term (300 years) because of the long time intervals between stand initiating events in NDT 1 and 2 forests. Also, Canfor's fire control and forest health measures are reducing the frequency of catastrophic events that could affect forests within the NHLB. Consequently, further forecasting is not a priority. Rather, forest interior representation in the NHLB is considered in concert with the information package and timber supply analysis for SFM plan 9 (Appendix III and IV). Meanwhile, Canfor will explore spatial tools that will forecast priority areas for conserving biodiversity over time.

Old Growth Management Areas

	Indicator	*Target*	*Acceptable Variance*
3.	Percent OGMA by BEC variant within LUs.	OGMAs are represented across the landscape according to the targets listed by BEC variant within LUs in Table 9.	-10% of the target for each BEC subzone and LU.

JUSTIFICATION – Old growth forests, their associated structures and processes, and the species that depend on them contribute to landscape-level biological diversity. Therefore, retention of old growth forest areas across a landscape is considered a key indicator of sustainable management for the objective of conserving ecosystem diversity. OGMA objectives are specified in the LUPs for the Lower and Upper Nimpkish LUs (see section 3.1.2).

DETAILS – This indicator is measured through a spatial analysis as the total area of productive forest that is formally assigned as OGMA. Target areas within each BEC subzone and LU were derived from data presented in the LUPs for the Lower and Upper Nimpkish LUs. OGMA areas must meet or exceed the target areas, as presented in Table 9.

OGMA areas are determined through a spatial analysis of data completed approximately every 5 years, as follows:

Calculation		**$OGMA_{BEC-LU}$**
Variables	$OGMA_{BEC-LU}$	Total productive forest area assigned as OGMA within each BEC subzone and LU.

Old growth forests retained within PAs are excluded from this indicator. Additionally, old growth forests retained through various stand-level retention patches and riparian reserve zones are not a tracked through this indicator. Rather, these areas are considered within the NHLB.

CURRENT STATUS – The approval process of MSRM's LUP for priority biodiversity, which establishes formal objectives for OGMAs, is complete for the Upper and Lower Nimpkish LUs (see section 3.1.2). The spatial designation of the draft OGMAs should not change prior to approval, as they were prepared in concert with the MSRM. In absence of established OGMAs, Canfor's planning and practices are conducted to conserve the draft OGMAs.

Table 9 reports the current status of Canfor's performance in protecting these draft OGMAs. This table intentionally separates PAs, some of which contribute to the OGMA targets, and identifies the recruitment required to meet each OGMA target.

Currently, the only OGMA target that not met is within the Upper Nimpkish LU CWHmm1 variant. This is not a significant concern, since 17% of this variant is within the NHLB. In addition, the result is well within the acceptable variance and the combined target for the CWHmm1 and CWHxm2 variants, which are both very similar ecosystems, is exceeded by 0.4% within the Upper Nimpkish LU.

Table 9 Indicator results for old growth management areas 1.

BEC Variant	OGMA Old (ha)	OGMA Recruit[2] (ha)	PAs Old[3] (ha)	PAs Recruit[4] (ha)	Total Area (ha)	Short-term Target Shortfall/ Surplus (ha)	Long-term Target Shortfall/ Surplus (ha)
Lower Nimpkish (Low biodiversity emphasis)							
CWHxm2	789.2	439.7	100.8	454.0	1,783.7	1,388.2	597.1
CWHvm1	1,889.0	539.5	827.5	427.8	3,683.8	2,485.4	88.6
CWHvm2	1,411.7	138.4	549.2	86.6	2,185.9	1,552.1	284.4
MHmm1	1,066.0	96.4	155.2	66.3	1,383.9	986.6	192.0
Totals	**5,155.9**	**1,214.0**	**1,632.7**	**1,034.7**	**9,037.3**	**6,412.3**	**1,162.1**
Upper Nimpkish (Intermediate biodiversity emphasis)							
CWHxm2	390.4	219.0	0	0	609.4	137.9	
CWHmm1	940.3	117.3	267.8	2.7	1,328.1	-84.2	
CWHvm1	2,433.4	65.4	964.3	17.9	3,481.0	123.2	
CWHvm2	2,601.5	54.6	1,106.6	9.3	3,772.0	33.4	
MHmm1	2,100.4	75.0	1,200.4	19.2	3,395.0	302.2	
Totals	**8,466.0**	**531.3**	**3,539.1**	**49.1**	**12,585.5**	**512.5**	

1 Based on productive mature forest within an OGMA and current to December 31, 2001

2 Defined as productive forest within an OGMA that is mapped as <250 years old within the primary and secondary canopy layers. The majority of the identified recruitment is within previously unharvested mature forest resulting from natural disturbance events.

3 In the Upper Nimpkish LU only, this includes

- *CWHmm1: all productive forest, $\geq$300m^3/ha in old growth within VILUP Goal 1 Parks and previously unharvested productive forest <250 years old;*
- *CWHvm1: very high potential marbled murrelet nesting habitat within PAs;*
- *CWHvm2: very high and high marbled murrelet nesting habitat within PAs;*
- *MHmm1: very high, high, moderate, and low potential marbled murrelet nesting habitat from pre1995 Schoen Park and all old growth within Goal 1 PAs from VILUP $\geq$300m^3/ha and previously unharvested productive forest <250 years old.*

4 PA recruitment is defined as productive forest in PAs between 50 and 249 years old.

STRATEGY AND IMPLEMENTATION SCHEDULE - In the Lower Nimpkish LU, unharvested mature and harvested second growth recruitment will be required to meet approximately 20% of the long-term target. This is considered through the LU Planning process, where OGMAs and discrete areas of old growth retention are proposed. Whereas all potential OGMAs are verified by an aerial photograph interpretation, field verification (aerial survey and ground-truthing) of random polygons may also be conducted for biological and operational analyses. Areas identified for OGMAs are considered with operational planning.

To accommodate operational requirements for timber harvesting and road or bridge construction, OGMAs that are 10 ha or greater in size may undergo minor boundaries adjustments, provided that:

- *The boundary adjustment does not affect more than 10 percent of the area of the OGMA,*
- *Road or bridge construction is required to access resource values beyond or adjacent to the OGMA and no other practicable option for road or bridge location exists,*
- *Suitable OGMA replacement forest (only if mapped OGMA is reduced below target)of equivalent age, structure and area is identified either (in order of priority) directly adjacent to, without unduly affecting timber supply, or in the same variant and LU as the adjusted OGMA, and*
- *Boundary adjustments and OGMA replacement areas are documented, mapped and submitted to the delegated decision maker annually.*

Other permissible activities associated with the OGMAs include:

- *Timber harvesting to prevent the spread of insect infestations or diseases that pose a significant threat to forest OGMAs. Salvage within OGMAs will be done in a manner that retains as many old growth forest attributes as possible.*
- *In OGMAs with a high likelihood of windthrow, pruning and/or topping may be carried out to maintain the integrity of the OGMA.*
- *Road maintenance, deactivation, removal of danger trees, or brushing and clearing on existing roads under active tenure within the right-of-way for safety purposes.*
- *Felling of guyline clearance, tailhold anchor trees, or danger trees along cutblock boundaries or within the right of way on new road/bridge alignments to meet safety requirements.*
- *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 less 0.5 ha in total.*
- *Small boundary adjustments for operational reasons, or intrusions, other than those specified above, that result in a net loss to the OGMA of less than or equal to 0.5 ha.*

OGMA replacement forest is required as a result of activities listed above as other permissible activities, when the total net change to the OGMA exceeds 0.5 ha in size and the resulting OGMA area is less than outlined in Table 9. Replacement forest must be biologically suitable, of equivalent age, structure and area, and situated (in order of priority), either immediately adjacent to the existing OGMA, or in the same variant and landscape unit as the existing OGMA. Boundary adjustments and OGMA replacement areas must be documented, mapped and submitted to the delegated decision maker annually.

MONITORING - As OGMAs are established for the long term, little monitoring will be required due to the forest dynamics on the Coast. Therefore, this indicator will be summarized from timber supply analyses done every 5 to 10 years. Additionally, annual aerial surveys will be conducted to identify any significant windthrow events in the OGMAs. Significant changes to the forest structure of OGMAs as a result of severe windthrow may necessitate further analysis or changes to OGMA boundaries.

FORECASTING - Established OGMAs are assumed to remain through the long term (300 years) because of the long time intervals between stand initiating events in NDT 1 and 2 forests. Also, Canfor's fire control and forest health measures are reducing the frequency of catastrophic events that could affect old growth availability. Most of the NDT 1 is naturally cycled through gap dynamics and has not been disturbed by fire in the past 1,000 years. Whereas, the majority of the NDT 2 has experienced some large-scale disturbance by fire within in the past 1,000 years.

OGMAs are considered in the information package and timber supply analysis for SFM plan 9 (Appendix III and IV). Meanwhile, Canfor will explore spatial tools that will forecast OGMA replacement over time.

Wildlife Tree Retention

	Indicator	*Target*	*Acceptable Variance*
4.	Percent wildlife tree retention by BEC subzone within LUs.	Wildlife tree retention is represented across the landscape and over any 5-year period according to the targets listed by BEC subzone within LUs in Table 10.	Not acceptable.

JUSTIFICATION - Wildlife Tree Retention (WTR) is the primary mechanism for managing stand structure and biodiversity at the stand level. Specifically, a WTR area is occupied by wildlife trees, which are standing dead or live trees with special characteristics that provide valuable habitat for the conservation or enhancement of wildlife. Wildlife trees can be retained as single trees or patches and may be comprised of timber within the NHLB, such as

riparian reserve zones, ungulate winter range, gully management areas, or inoperable forests. WTR objectives are specified in the LUPs for the Lower and Upper Nimpkish LUs (see section 3.1.2).

DETAILS – The total area assigned as WTR must meet or exceed the percent targets by LU and BEC subzone for appropriate cutblocks over the landscape,, as presented in Table 10. These targets were derived from the LUP the Lower and Upper Nimpkish LUs. Accordingly, the following details apply for this indicator:

- *This indicator does not include minor salvage cutblocks (defined as less than 2.0 ha of harvesting and/or less than total volume of 2,000m3 excluding volume from any road clearing width, if the road is required to facilitate the removal of the timber within the minor salvage cutblock).*
- *Cutblocks overlapping one or more LUs or BEC subzones are assigned according to the majority harvest area(s). Harvest year for each cutblock is assigned according to the date felling begins.*
- *Target levels apply to cutblocks where felling started during any five-year period beginning January 1 of any calendar year. These will be applied following establishment of LUP objectives, beginning January 1, 2006. Meanwhile, data for all cutblocks felled over the past five years is summarized as preliminary information.*

Stand-level percent WTR is calculated for each cutblock as follows:

Calculation	**$\%\ WTR_{CB} = WTR_{CB} / HA_{CB}$**	
Variables	$\%\ WTR_{CB}$	Percent WTR for a cutblock.
	WTR_{CB}	Total area assigned as WTR for a cutblock.
	HA_{CB}	Total harvest area[1] for a cutblock.
Notes	*1.*	*Harvest area is the net area to be reforested, including clearcut and selection areas, plus permanent access structures (i.e., roads, culverts, bridges)*

Landscape-level percent WTR is determined through a summary of stand-level calculations for All cutblocks where felling began over a five-year period as follows:

Calculation	**$\%\ WTR_{BEC\text{-}LU} = WTR_{BEC\text{-}LU} / HA_{BEC\text{-}LU}$**	
Variables	$\%\ WTR_{BEC\text{-}LU}$	Percent WTR within each BEC subzone and LU for all appropriate cutblocks harvested over a 5-year period.
	$WTR_{BEC\text{-}LU}$	Total area assigned as WTR by BEC subzone and LU for all appropriate cutblocks[2] harvested over a 5-year period.
	$HA_{BEC\text{-}LU}$	Total harvest area[1] by BEC subzone and LU for all appropriate cutblocks[2] harvested over a 5-year period.
Notes	*1.*	*Harvest area is the net area to be reforested, including clearcut and selection areas, plus permanent access structures (i.e., roads, culverts, bridges).*
	2.	*Each cutblock is assigned the majority BEC subzone and LU within the area harvested.*

CURRENT STATUS – In 1993, Canfor began retaining wildlife tree patches (WTP) in areas where wildlife inventory/research data indicated that it was appropriate. With the introduction of the FPC in 1995, Canfor began leaving WTPs in all cutblocks. Most were located on the edge of the harvest area in constrained timber such as riparian reserve zones, gullies, inoperable or uneconomic areas. Between 1995 and 1998, under the direction of MoF, Canfor retained 7% of the total area under prescription in each cutblock as WTPs. In 1998, Canfor conducted a landscape level analysis to determine the level of WTP retention required by Table 20(b) of the *Biodiversity Guidebook* (BC MoF and MoELP 1995). In April 1998, the MoF approved Canfor's application of the variable percentages from Table 20(b) to all new cutblocks planned in the Lower and Upper Nimpkish LUs.

Specific WTR stand-level targets and a current summary are shown in Table 10 by BEC subzone within LUs. These show that WTR is exceeded for each BEC subzone within both LUs.

Table 10 Indicator results for wildlife tree retention.

Landscape Unit	BEC Subzone	Wildlife Tree Retention Targets [1]	Current Landscape-Level % [2]	Harvest Area (ha)
Lower Nimpkish (Low biodiversity emphasis)	CWHxm	≥11%	17.6%	879.4
	CWHvm	≥9%	15.7%	2,237.0
	MHmm	≥1%	8.6%	259.5
Upper Nimpkish (Intermediate biodiversity emphasis)	CWHxm	≥13%	13.8%	165.1
	CWHmm	≥14%	17.9%	169.3
	CWHvm	≥9%	13.9%	2,903.8
	MHmm	≥3%	12.3%	308.4

1 From Landscape Unit Plan Biodiversity Objective for Lower and Upper Nimpkish Landscape Units.
2 Summarized for all appropriate cutblocks where felling started between Jan 1, 2000 and Dec 31, 2004.

The MSRM's LU planning for priority biodiversity establishes formal objectives for WTR. This process is currently underway with final approval expected in March 2005 (see section 3.1.2). Considering the numerous stand- and landscape level constraints already applied over the Nimpkish DFA, Canfor expects that the established objectives will relax the requirement to apply WTR targets to all planned cutblocks. Rather, WTR targets will be assessed over the landscape. This is viewed as a simple mechanism to help balance objectives for biodiversity with objectives for timber harvesting.

STRATEGY AND IMPLEMENTATION SCHEDULE - Canfor applies retention silviculture systems to achieve WTR targets by BEC subzone according to Table 10. In addition, the following criteria are applied to select WTPs:

(1) WTPs must be well distributed across the BEC subzone.

(2) When designated at the site plan level, WTPs must be located within or immediately adjacent to a cutblock.

(3) No timber harvesting, including single tree selection is to occur within WTPs, except as noted below:

  (a) Falling of danger trees;

  (b) Salvage of wind-thrown timber is permitted within WTPs where windthrow impacts 25% to 50% of the dominant or co-dominant stems. Salvage of wind-thrown timber and harvesting of remaining standing stems is permitted within WTPs where 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 such salvage/harvesting is planned and authorized, suitable replacement WTP of at least equivalent area must be identified to achieve the retention target.

(4) WTPs should include, if present, remnant old-growth patches and live or dead veteran trees (excluding danger trees).

(5) WTPs should include representative larger trees (dbh ≥ average operational cruise) for the stand and suitable wildlife trees, if available, as well as identified wildlife habitat features, if present (excluding danger trees).

(6) BEC subzones and variants will be determined by site plan information.

(7) In WTPs with a high likelihood of windthrow, pruning and/or topping may be carried out to maintain the integrity of the WTP.

(8) Priority ecosystem groups discussed in indicator 1 (percent non-harvestable forest by ecosystem groups) on page 15 should be considered as follows:

  (a) WTPs should include identified ecosystem groups within stands of mature and old forest > 140 years (structural stages 6 and 7). In these cases, the WTR target should be increased to at least 15%.

  (b) WTPs should be established as buffers adjacent to identified ecosystem groups to increase the amount of interior NHLB.

  (c) WTPs should include rare plants identified in (see Table 7).

The target percentage for WTR is applied at a landscape level rather than the stand level to provide flexibility in capturing areas with higher biodiversity values, such as riparian management areas around wetlands. Wherever

possible, WTR areas should contain high habitat value wildlife trees. These typically involve trees with little economic value and characteristics like broken tops, stem scars or fungal conks.

MONITORING – A spreadsheet is used to track WTR areas relative to the area harvested for each cutblock. This data is summarized annually, compiled over a 5-year rolling average and included in the SFM annual report.

Canfor recently began to identify, classify and track various retention patches spatially. As this approach develops it will identify landscape level retention patches that are not currently designated during cutblock planning.

FORECASTING - Assumptions for future WTR are considered in the information package and timber supply analysis for SFM plan 9 (Appendix III and IV).. Growth and yield adjustments are applied as both area and yield reductions (see Appendix III).

Internal Patch Retention

	Indicator	*Target*	*Acceptable Variance*
5.	Percent internal patch retention by LU, EMU and BEC subzone.	Internal patches are represented across the landscape and over any 5-year period according to the targets listed by LU, EMU, and BEC subzone in Table 11.	-10% of the target for each LU, EMU, and BEC subzone.

JUSTIFICATION - Retaining internal mature forested patches provides more forest ecosystem components than leaving just single trees. They also aid in maintaining forest understory, coarse woody debris, forest floor diversity and wildlife trees. Patches of trees offer "stepping stones" for organisms crossing an opening and thus enhances the connectivity. Retaining small patches of mature trees also allows organisms to colonize the harvested area in the future, particularly as many organisms are naturally adapted to the structural complexity of old forests.

Internal patch retention (IPR) helps to maintain more forest ecosystem components in fire-adapted ecosystems, where wildfires typically left a mosaic of single trees and forested patches. Similarly, patches naturally occur in gap-dynamic ecosystems that are adapted to small, infrequent disturbances.

DETAILS – The total area assigned as IPR must meet or exceed the percent targets by LU, EMU and BEC subzone for appropriate cutblocks over the landscape, as presented in Table 11. These targets were derived from proportions of WTR targets established through the LUP the Lower and Upper Nimpkish LUs. Accordingly, the following details apply for this indicator:

- *This indicator does not include minor salvage cutblocks (defined as less than 2.0 ha of harvesting and/or less than total volume of 2,000m3 excluding volume from any road clearing width, if the road is required to facilitate the removal of the timber within the minor salvage cutblock).*
- *Cutblocks overlapping one or more LUs, EMUS, or BEC subzones are assigned according to the majority harvest area(s), whereas each area is separated at the landscape-level. Harvest year for each cutblock is assigned according to the date felling begins.*
- *Target levels apply to cutblocks where felling started during any five-year period beginning January 1 of any calendar year. These will be applied following establishment of LUP objectives, beginning January 1, 2006. Meanwhile, data for all cutblocks felled over the past five years is summarized as preliminary information.*

Stand-level percent IPR is calculated for each cutblock as follows:

Calculation	**% IPR $_{CB}$ = IPR $_{CB}$ / HA $_{CB}$**	
Variables	% IPR $_{CB}$	Percent IPR for a cutblock.
	IPR $_{CB}$	Total area assigned as IPR for a cutblock.
	HA $_{CB}$	Total harvest area[1] for a cutblock.
Notes	*1. Harvest area is the net area to be reforested, including clearcut and selection areas, plus permanent access structures (i.e., roads, culverts, bridges)*	

Landscape-level percent IPR is determined through a summary of stand-level calculations for All cutblocks where felling began over a five-year period as follows:

Calculation	**% IPR $_{LU\text{-}EMU\text{-}BEC}$ = IPR $_{LU\text{-}EMU\text{-}BEC}$ / HA $_{LU\text{-}EMU\text{-}BEC}$**	
Variables	% IPR $_{LU\text{-}EMU\text{-}BEC}$	Percent IPR within each BEC subzone and LU for all appropriate cutblocks harvested over a 5-year period.
	IPR $_{LU\text{-}EMU\text{-}BEC}$	Total area assigned as IPR by BEC subzone and LU for all appropriate cutblocks[2] harvested over a 5-year period.
	HA $_{LU\text{-}EMU\text{-}BEC}$	Total harvest area[1] by BEC subzone and LU for all appropriate cutblocks[2] harvested over a 5-year period.
Notes	*1. Harvest area is the net area to be reforested, including clearcut and selection areas, plus permanent access structures (i.e., roads, culverts, bridges).*	
	2. Each cutblock is assigned the majority BEC subzone and LU within the area harvested.	

CURRENT STATUS - Table 11 shows that for recently planned cutblocks, internal patch targets are exceeded across all EMUs. It appears strategies to address windfall and previous forest influence targets are accounting for the additional retention.

Table 11 Indicator results for internal patch retention.

Landscape Unit	Ecosystem Management Unit	BEC Subzone	Internal Patch Retention Targets	Current Landscape-Level [1]	Harvest Area (ha)
Lower Nimpkish (Low biodiversity emphasis)	SMZ Fire	CWHxm	≥4.40%	n/a	0.0
	SMZ Gap	CWHvm	≥4.50%	20.2%	180.4
	SMZ Gap	MHmm	≥0.50%	n/a	0.0
	EFZ Fire	CWHxm	≥1.65%	15.8%	149.9
	EFZ Gap	CWHvm	≥2.25%	10.0%	317.7
	EFZ Gap	MHmm	≥0.25%	n/a	0.0
Upper Nimpkish (Intermediate biodiversity emphasis)	SMZ Fire	CWHxm	≥5.20%	9.7%	79.5
	SMZ Fire	CWHmm	≥5.60%	16.2%	26.5
	SMZ Gap	CWHvm	≥4.50%	12.7%	291.5
	SMZ Gap	MHmm	≥1.50%	n/a	0.0
	GMZ Fire	CWHxm	≥3.25%	n/a	0.0
	GMZ Fire	CWHmm	≥3.50%	6.6	31.6
	GMZ Gap	CWHvm	≥3.15%	11.1%	127.0
	GMZ Gap	MHmm	≥1.05%	n/a	0.0

1 Summarized for all appropriate cutblocks where felling started between Jan 1, 2000 and Dec 31, 2004. Results are not applicable in some LU-EMU-BEC scenarios where no harvesting occurred.

STRATEGY AND IMPLEMENTATION SCHEDULE – Canfor applies a retention silviculture system to achieve internal patch targets. Internal patches are measured as the total area that groups of trees occupy within a cutblock as a percentage of the total harvest area. This is considered as cutblocks are planned.

Besides the targets described above, Canfor considers other criteria for establishing internal patches. These are based on an analysis of 3 historic wildfires (Canfor 2002) and monitoring conducted on TFL 39. Table 12 summarizes the criteria considered in identifying internal patches. The VILUP HLP order indicates that internal patches are non-contiguous with cutblock boundaries (Order II 1b) for SMZ areas. In GMZs and EFZs, however, internal patches can be connected to the surrounding forest to facilitate connectivity (such as a gully management area or riparian management area within a stand), provided the patches intrude more than 2 tree lengths into the stand.

Areas contributing to internal patch retention include mature forested patches that are generally representative of the surrounding timber, less natural types within the non-productive landbase (NPLB). Selection harvesting may be required within the patches with high risk of windthrow. This is acceptable provided at least 60% of the stand basal area is retained. Retention patches on the edge of a cutblock do not contribute to internal patch retention unless they are immediately adjacent to a harvested area less than 40 years old.

The minimum size of the internal patches are provided in Table 12, however, this may vary according to the following site specific variables:

- *the quantity and habitat quality of wildlife trees or special features in the patch;*
- *presence of rare forest elements, i.e. Pacific yew;*
- *evidence and type of wildlife use in or near the patch (e.g., cavity nesters, black bear denning, etc.);*
- *presence of habitat features associated with the patch such as riparian areas, rocky outcrops or gully complexes, or upland hardwood stands;*
- *slope or terrain constraints which affect cutblock design, choice of silvicultural system, and type of harvesting and yarding methods; and*
- *other management objectives such as visual quality, forest health, windthrow hazard, and Identified Wildlife (e.g., presence of a Queen Charlotte goshawk nest).*

Treed patches are well distributed across the landscape and where possible, centred on a special feature or high value wildlife tree (e.g., black bear den tree, culturally modified tree, karst feature; or a rare tree species). The maximum distances between patches are also provided in Table 12, however, this distance will be site specific depending on worker safety concerns, tree species composition, and terrain.

Where applicable, windthrow strategies are developed to protect internal patches. Although windthrow cannot be eliminated, it can be minimized through careful planning and treatment. These strategies may involve altering the patch shape, buffering the tree patch, feathering the buffer and topping or pruning trees.

Table 12 Considerations for internal patch retention.

Other Criteria	SMZ	GMZ	EFZ
Size	≥0.25 ha	≥0.20 ha	≥0.15 ha
Distribution [1]	150 m	250 m	500 m
Boundary Shape	Non-contiguous	Non-contiguous or connected	
Other Considerations	a) Centre patch around special feature or high value wildlife trees [2] b) Retain >60% tree basal area within internal patch c) Minimize windthrow damage d) In fire adapted ecosystems where single tree retention targets cannot be met, use RMZ targets for gap adapted ecosystems		

1. *Optimum distance between patches*
2. *Examples: priority ecosystem groups, black bear den tree, culturally modified tree, karst feature or rare tree species*

MONITORING – A spreadsheet is used to track internal patch retention in each cutblock relative to the harvest area. This data is summarized annually and included in the SFM annual report.

Canfor recently began a project to identify and classify various retention patches spatially. This will identify landscape level retention patches that are not currently designated during cutblock planning.

FORECASTING – Assumptions for future internal patch retention are considered in the information package and timber supply analysis for SFM plan 9 (Appendix III and IV). Growth and yield adjustments are applied as both area and yield reductions (see Appendix III).

Single tree retention

	Indicator	*Target*	*Acceptable Variance*
6.	Number of single trees per hectare retained by EMU.	Single trees retained are represented across the landscape and over any 5-year period according to the targets listed by EMU in Table 13.	-10% of the minimum target for each EMU.

JUSTIFICATION – Retaining single mature trees provides important wildlife habitat, especially when used in conjunction with WTPs as a habitat strategy. Single tree retention (STR) helps to maintain more forest ecosystem components in fire-adapted ecosystems, where wildfires typically left a mosaic of single trees and forested patches.

The average number of single trees per hectare for each cutblock is calculated using harvest area, less areas where tree retention is not practical for safety or natural reasons, like: slopes greater than 30%; road and machine right-of-way; natural non-treed forest types (e.g., rock, brush, avalanche chutes); and root rot disease. Targets do not apply to every hectare. Rather, variable spacing of single trees is intended across the cutblock. Also, especially in GMZ and SMZ, small groups of 2 to 5 trees are encouraged to reduce the overall impact of shade on planted Douglas-fir seedlings.

Targets outlined in Table 13 for fire-adapted ecosystems were derived using 1999 and 2000 marbled murrelet habitat transect data from the Nimpkish DFA, which showed an average of 37 trees >80 cm dbh[1]/ha (Harper *et al* 2000; Harper *et al* 2001). The intent is to capture large trees both as single trees and within retention patches. Where targets cannot be met in these ecosystems due to some slope, safety or windthrow risk consideration, internal patch retention will be increased by 10% to mimic targets for a gap dynamic system. Although representative, windfirm trees are preferred, large trees are beneficial to a number of other wildlife species such as woodpeckers if a decay pocket is present. Also, rare tree species and trees with unique features may be retained as patch anchors, along with any understory or non-merchantable western redcedar is retained where possible (Note: these do not count toward the target).

Meanwhile across all gap dynamic ecosystems, where no specific targets are set, retaining one tree for every 2.5 hectares is desirable. Targets are not set for these ecosystems due to the steep slopes that generally occur there and because STR does not properly emulate the infrequent large-scale wildfires that are associated with these ecosystems. Leaving single trees on steep slopes harvested with cable systems is a serious concern for worker safety. Consequently targets were not set within gap dynamic ecosystems, where slopes are generally steeper. STR is encouraged on slopes less than or equal to 30% within these ecosystems because there are generally more opportunities here to retain low economic value trees with high biodiversity values, compared to low elevations.

DETAILS – The total area assigned as STR must meet or exceed the targets by EMU for appropriate cutblocks over the landscape, as presented in Table 13. The following details apply for this indicator:

- *This indicator does not include minor salvage cutblocks (defined as less than 2.0 ha of harvesting and/or less than total volume of 2,000m3 excluding volume from any road clearing width, if the road is required to facilitate the removal of the timber within the minor salvage cutblock).*
- *Cutblocks overlapping one or more EMU are assigned according to the majority harvest area(s), whereas each area is separated at the landscape-level. Harvest year for each cutblock is assigned according to the date felling begins.*

[1] *dbh – tree diameter at breast height*

- *Target levels apply to cutblocks where felling started during any five-year period beginning January 1 of any calendar year. These will be applied following establishment of LUP objectives, beginning January 1, 2006. Meanwhile, data for all cutblocks felled over the past five years is summarized as preliminary information.*

Stand-level percent STR is calculated for each cutblock as follows:

Calculation	**AVG STR $_{CB}$ = STR $_{CB}$ / HA $_{CB}$**	
Variables	AVG STR $_{CB}$	Average number of single trees retained per hectare for a cutblock.
	STR $_{CB}$	Total number of single trees retained for a cutblock.
	HA $_{CB}$	Area available for single trees[1] for a cutblock.
Notes	*1. Area available for single trees is the net area to be reforested, plus permanent road area, minus right-of-way (15m on either side of the road centerline), minus area for natural NP, minus area of root disease, minus areas with slopes > 30% where trees cannot be safely retained, minus selective areas where retention is greater than 60%.*	

Landscape-level percent STR is determined through a summary of stand-level calculations for All cutblocks where felling began over a five-year period as follows:

Calculation	**AVG STR $_{EMU}$ = STR $_{EMU}$ / HA $_{EMU}$**	
Variables	AVG STR $_{EMU}$	Average number of single trees retained per hectare within each EMU LU for all appropriate cutblocks harvested over a 5-year period.
	STR $_{EMU}$	Total number of single trees retained by EMU for all appropriate cutblocks[2] harvested over a 5-year period.
	HA $_{EMU}$	Area available for single trees[1] by EMU for all appropriate cutblocks[2] harvested over a 5-year period.
Notes	*1. Area available for single trees is the net area to be reforested, plus permanent road area, minus right-of-way (15m on either side of the road centerline), minus area for natural NP, minus area of root disease, minus areas with slopes > 30% where trees cannot be safely retained, minus selective areas where retention is greater than 60%. The net area to be reforested may be used where targets are not specified (e.g., gap-dynamic ecosystems).* *2. Each cutblock is assigned the majority EMU within the area harvested.*	

CURRENT STATUS - Table 13 shows that for recently planned cutblocks, STR targets are met in two of the tree EMUs where targets are set. The data only includes a small area within the GMZ_Fire EMU, which contributes to the lower STR.

Table 13 Indicator results for single tree retention.

Ecosystem Management Unit	Target Range of Single Trees/ha	Current Landscape-Level Average Single Trees/ha [1]	Total Area Available for Single Trees (ha)
SMZ_Fire	12-18	12.3	68.1
SMZ_Gap	0.4	0.3	364.1
GMZ_Fire	6-10	7.3	27.8
GMZ_Gap	0.4	0.5	117.1
EFZ_Fire	2-5	3.7	150.3
EFZ_Gap	0.4	1.7	109.5

1 Summarized for all appropriate cutblocks where felling started between Jan 1, 2000 and Dec 31, 2004.

STRATEGY AND IMPLEMENTATION SCHEDULE – Canfor applies a retention silviculture system to achieve STR targets. These are measured, as the total number of trees retained within a cutblock as a fraction of the total area harvested that is practical for retaining trees. This is considered as cutblocks are planned.

Trees in selective zones with diameters greater than or equal to the average diameters from the timber cruise will count toward STR targets if the basal area retention does not exceed 60%. If the basal area retention is equal to or exceeds 60%, the area will count as internal patch retention.

Second growth hemlock stands will be challenging to retain single trees for the long-term due to high susceptibility to windthrow. If the stand is in a fire-adapted ecosystem, consider leaving internal patches consistent with gap dynamic targets.

Due to its thick, fire resistant bark and resistance to windthrow, Douglas-fir is the most ecologically suited tree species to retain as single trees. Likewise, western white pine and western redcedar are good species to retain because they are more wind firm than western hemlock or amabilis fir. Western white pine and western hemlock also have high wildlife value for woodpecker species, while western redcedar has high value as black bear den trees and cultural use.

Residual trees can be low economic quality since the objective is not to provide a seed source to regenerate the stand. In fact, trees with high wildlife/biodiversity value are often of low economic value due to decay. The best residual tree is a live tree with a broken top. This type of tree is generally safe to work around, less prone to windthrow, and has high biodiversity values. An exception to this would be trees that have root disease – trees in this condition make poor wildlife trees because they are prone to windthrow, thereby reducing their longevity as wildlife habitat.

MONITORING – A spreadsheet is used to track STR in each cutblock relative to the TAUP. This data is summarized annually and will be included in the SFM annual report.

FORECASTING – Assumptions for future STR are considered in the information package and timber supply analysis for SFM plan 9 (Appendix III and IV). Growth and yield adjustments are applied as area and yield reductions (see Appendix III).

Forest Influence

Indicator	*Target*	*Acceptable Variance*
7. Percent forest influence by EMU.	Forest influence is represented across the landscape and over any 5-year period according to the targets listed by EMU in Table 14	As shown for each EMU in Table 14.

JUSTIFICATION - The term forest influence has been adopted from Kimmins (1992) and refers to the total area of a cutblock that is within 1 tree length from the base of a tree or group of trees, whether or not the tree or group of trees is inside the cutblock. Coastal old growth forests are adapted to infrequent natural disturbances and a fairly high degree of forest influence as historic forest fires typically left a mosaic of single trees (usually Douglas-fir) and forested patches.

A combination of STR and group retention (patches) will achieve forest influence targets given in Table 14. STR in fire-adapted ecosystems ensures that a large proportion of the cutblock will be influenced by a small number of surviving trees; as few as 5-10% of the trees dispersed over the entire opening can influence nearly 100% of the area to some degree (Scientific Panel for Sustainable Forest Practices in Clayoquot Sound 1995). Even retaining less than 5% of the trees may have a significant influence depending on size and spatial pattern in the cutblock. For instance, a single 40 m tall tree, 1 tree length from the cutblock edge, represents 0.5 ha of forest influence.

Using forest influence target percentages by EMU allows for target variations between cutblocks due to site variables such as slope, topography, type of harvesting and yarding equipment, presence of forest health agents (e.g., dwarf mistletoe, root rot centres), and worker safety factors.

DETAILS – The total area assigned as forest influence must meet or exceed the targets by EMU for appropriate cutblocks over the landscape, as presented in Table 14. The following details apply for this indicator:

- *This indicator does not include minor salvage cutblocks (defined as less than 2.0 ha of harvesting and/or less than total volume of 2,000m3 excluding volume from any road clearing width, if the road is required to facilitate the removal of the timber within the minor salvage cutblock).*
- *Cutblocks overlapping one or more EMU are assigned (s), whereas each area is separated at the landscape-level. Harvest year for each cutblock is assigned according to the date felling begins.*
- *Target levels apply to cutblocks where felling started during any five-year period beginning January 1 of any calendar year. These will be applied following establishment of LUP objectives, beginning January 1, 2006. Meanwhile, data for all cutblocks felled over the past five years is summarized as preliminary information.*

Stand-level percent forest influence is calculated for each cutblock as follows:

Calculation	**$\%\ FI_{CB} = FI_{CB} / HA_{CB}$**	
Variables	$\%\ FI_{CB}$	Percent forest influence for a cutblock.
	FI_{CB}	Total area assigned as forest influence for a cutblock.
	HA_{CB}	Total harvest area[1] for a cutblock.
Notes	*1. Harvest area is the net area to be reforested, including clearcut and selection areas, plus permanent access structures (i.e., roads, culverts, bridges)*	

Landscape-level percent forest influence is determined through a summary of stand-level calculations for All cutblocks where felling began over a five-year period as follows:

Calculation	**$\%\ FI_{EMU} = FI_{EMU} / HA_{EMU}$**	
Variables	$\%\ FI_{EMU}$	Percent forest influence within each EMU for all appropriate cutblocks harvested over a 5-year period.
	FI_{EMU}	Total area assigned as forest influence by EMU for all appropriate cutblocks[2] harvested over a 5-year period.
	HA_{EMU}	Total harvest area[1] by EMU for all appropriate cutblocks[2] harvested over a 5-year period.
Notes	*1. Harvest area is the net area to be reforested, including clearcut and selection areas, plus permanent access structures (i.e., roads, culverts, bridges).* *2. Each cutblock is assigned the majority EMU within the area harvested.*	

CURRENT STATUS – Table 14 shows that for recently planned cutblocks, forest influence targets are exceeded across all EMUs. It appears strategies to address windfall are accounting for the additional retention.

Table 14 Indicator results for forest influence.

Ecosystem Management Unit	% Forest Influence Targets	Acceptable Variance	Current Landscape-Level % [1]	Harvest Area (ha)
SMZ_Fire	≥60%	0%	67.9%	106.0
SMZ_Gap	≥60%	0%	74.0%	471.9
GMZ_Fire	≥50%	-10%	61.1%	31.6
GMZ_Gap	≥50%	-10%	64.3%	134.9
EFZ_Fire	≥50%	-20%	69.3%	173.1
EFZ_Gap	≥50%	-20%	62.6%	251.4

1 Summarized for all appropriate cutblocks where felling started between Jan 1, 2000 and Dec 31, 2004.

STRATEGY AND IMPLEMENTATION SCHEDULE - Canfor applies a retention silviculture system to achieve forest influence targets. Forest influence is measured for each cutblock as the percentage of the harvest area that is within 1 tree length from the base of a tree or group of trees. This is considered as cutblocks are planned.

MONITORING - A spreadsheet is used to track forest influence data in each cutblock relative to the TAUP. This data is summarized annually in the SFM annual report.

FORECASTING - Forest influence is only considered at a stand level. However, landscape level assumptions for retention of forested patches and single trees to achieve forest influence targets are considered in the information package and timber supply analysis for SFM plan 9 (Appendix III and IV). Growth and yield adjustments are applied as area and yield reductions (see Appendix III).

Value 1.2 Native Species Diversity

Biological diversity is promoted by maintaining native species diversity. Nine indicators are used to assess the following objectives developed for this value:

- *Maintain a diversity of habitats*
- *Maintain habitat for species at risk*
- *Maintain native tree species diversity, and*
- *Minimize potential negative effects on aquatic habitat.*

Objective 1.2 (a) Diversity of habitats to sustain a natural diversity of native species.

This objective is realized through indicators that address ecosystem representation in the NHLB, black bear denning habitat, ungulate winter ranges and special habitat features.

Ecosystems in the Non-Harvestable Forest Landbase

Maintaining a variety of forest ecosystems contributes to provide habitat diversity. Conserving an appropriate representation of forest ecosystems then, is an appropriate coarse-filter approach towards maintaining a natural diversity of native species. Ecosystem representation is addressed through indicator 1 (percent non-harvestable forest by ecosystem groups) and its associated target on page 15.

Black Bear Denning Habitat

	Indicator	*Target*	*Acceptable Variance*
8.	Area conserved for potential black bear denning habitat.	At least 11,000 ha are conserved as potential black bear denning habitat.	-5% of the target.

JUSTIFICATION - Black bears are listed as indicators of functioning young forests by the Canadian Council of Forest Ministers' *Criteria and Indicators of Sustainable Forest Management in Canada* (CCFM 1996). A critical element in sustaining coastal black bear populations is maintenance of sufficient winter denning habitat over time and space. In order to maintain black bear populations in the Nimpkish DFA over the long term, it is important to identify and manage areas of potential winter denning habitat.

The presence of black bears for recreational wildlife viewing and hunting is a desirable public resource objective.

DETAILS – Canfor developed a coarse scale habitat supply model in 2003 (Wilson 2003), which was used to identify areas for potential denning habitat. The model identified 22% of the productive area as potential denning habitat where 37% of this is located within productive areas of the NHLB. This indicator is measured as the total area of productive forest within the NHLB that is identified as appropriate habitat through the model. The area available for black bear denning habitat must meet or exceed the target of 11,000 hectares.

CURRENT STATUS - Black bears select dens at a number of spatial scales. At the patch scale, bears select for structural complexity: coarse woody debris, stocking densities of trees, percent vegetation cover, horizontal visibility and slope. Results at the stand scale were similar, but they avoid early seral stages. At the landscape level, bears avoid low elevations for denning. Black bear winter denning habitat potential can by modeled using variables that include elevation, forest cover and tree species composition of stands.

From 1996 to 2003, Canfor identified and retained 76 black bear den trees within harvest areas on the Nimpkish DFA. Most of these den trees were located in western redcedar or yellow-cedar.

STRATEGY AND IMPLEMENTATION SCHEDULE - Canfor has defined and delineated potential black bear denning habitat across the Nimpkish DFA. At the landscape scale, 31,525 ha of productive, potential habitat is defined across the Nimpkish DFA (not including pre 1995 Schoen Lake Park and Claude Elliot Ecological Reserve). Of this, 11,681 ha is located in the NHLB and 19,845 ha is located in the THLB. The management strategy is to retain potential denning habitat within the NHLB. In the THLB, known or suspected black bear den trees are retained in cutblocks where worker safety is not compromised. Where possible, WTPs or internal patch retention will be used to buffer black bear den trees. Priority for buffering will focus on arboreal dens and recently used dens (as indicated by the presence of hair). These special habitat features are tracked with indicator 10 (percent consistency with management practices to address special habitat features) on page 34.

MONITORING – Monitoring will focus on loss of habitat due to natural events. Monitoring habitat quality is not a priority because the forest condition is not expected to change significantly from the natural disturbance processes, and the winter ranges are comprised of long-lived tree species. Rather, denning habitat supply will be monitored spatially relative to the target every 5-years.

FORECASTING – Bear denning habitat located within the NHLB is assumed to remain through the long term (300 years) because of the long time intervals between stand initiating events in NDT 1 and 2 forests. Also, Canfor's fire control and forest health measures are reducing the frequency of catastrophic events that could affect forests within the NHLB. Bear denning habitat can, however, be forecasted for the THLB using Canfor's denning habitat model.

Ungulate Winter Ranges

Indicator	*Target*	*Acceptable Variance*
9. Area conserved for black-tailed deer and Roosevelt elk critical winter range.	At least 6,000 ha are conserved as ungulate winter range.	-3% of the target.

JUSTIFICATION - Black-tailed deer are listed as indicators of functioning young and mature forest by the Canadian Council of Forest Ministers (CCFM 1996) and are a species of local interest. Roosevelt elk are on the BC Provincial blue-list (CDC 2000), are indicators of functioning young and old growth forest (CCFM 1996), and are a species of local and cultural interest.

Ungulate winter ranges (UWR) are identified as areas that are important to the survival of local populations of black-tailed deer and Roosevelt elk during severe winter conditions. Heterogeneous old growth forests are thought to provide good winter range because of a combination of habitat characteristics including topography, stand structure, and stand age. These characteristics help to counterbalance the energetic costs associated with cold weather and deep snow.

Topographic features are associated with UWR because of their importance in influencing the depth and distribution of snow. These features include: (i) southerly aspects from east to west, (ii) moderate to steep slopes, (iii) < 1000 m elevation and (iv) minimal shading from adjacent mountains.

Stand structure features described as critical are: (i) long, well developed crowns (ii) small openings in a variable canopy that averages 65–70% closed, and (iii) multiple canopy layers with an understory of shade tolerant conifers. These features are particularly important for deer survival during harsh winters because they influence snow depth, availability of forage, security cover, and thermal cover.

Arboreal lichens are an important food source when snow depth restricts the availability of other forage species such as *Vaccinium* species, salal, deer fern, and bunchberry. Stand age appears to be a critical factor influencing the litterfall rate and abundance of arboreal lichens. Significant production of these lichens usually begins when stands reach approximately 100 years old.

UWRs also contribute to the habitat needs of many other wildlife species, such as Keen's long-eared Bat, marbled murrelet, and Queen Charlotte goshawk. Winter Range for ungulates can also be found within other constrained areas such as PAs where the vegetation and topographic structure are suitable.

DETAILS – This indicator is measured as the total area of productive forest within the NHLB that is conserved for ungulate winter range. This area must meet or exceed the target of 6,000 hectares.

CURRENT STATUS - The UWR strategy for TFL 37 was approved by Government on September 13, 2001 under section 69 of the BC FPC Operational Planning Regulation. In total, 6,205 ha of UWR were approved in TFL 37.

STRATEGY AND IMPLEMENTATION SCHEDULE – UWRs are not included within the harvest profile, except for salvage harvest or access requirements. When it is necessary to create access to other areas of the Nimpkish DFA, Canfor minimizes the construction of roads and right-of-way width within UWRs.

MONITORING - Monitoring will focus on loss of wintering habitat due to natural events. Monitoring habitat quality is not a priority because the forest condition is not expected to change significantly from the natural disturbance processes, and the winter ranges are comprised of long-lived tree species. Rather, wintering habitat supply will be monitored and summarized spatially relative to the target every 5 years.

FORECASTING - Once UWRs are established, that they should remain as such in the long term. This assumption is reasonable because of the old growth characteristics of UWR and the long intervals between natural disturbances in the ecosystems where most of the UWR's are found. Consequently, forecasting specific to UWRs is not required.

Special Habitat Features

Indicator	*Target*	*Acceptable Variance*
10. Percent consistency with management practices to address special habitat features.	Where worker safety is not compromised, all cutblocks felled over any 5-year period are managed to address special habitat features identified.	Not acceptable.

JUSTIFICATION – Stand-level measures contribute to the maintenance of biodiversity by maintaining species at risk within ecosystems. This indicator ensures that stand-level strategies are in place to manage specific habitat needs for species at risk and species of local interest. Habitat requirements of most species at risk are sufficiently known to develop special management areas, or prescribe activities that will not interfere with the well being of these species. Special habitat features include nests for bird species listed in Table 6.

DETAILS – This indicator is assessed based on three planning stages:

- *Cutblocks identified within a landscape-level overview of special habitat features mapped are checked for consistency with wildlife tags issued.*
- *The wildlife section in each site plan is checked for consistency with the wildlife tags issued. Often, features are identified just outside the cutblock or during the felling phase of harvesting and managed accordingly.*
- *Monitoring and inspection reports, public inquiries and agency reviews are checked to confirm that road construction and harvesting activities were carried out consistent with the site plan.*

Ultimately results are compiled as follows:

Calculation	**% HA $_{CONSISTENT}$ = HA $_{CONSISTENT}$ / HA $_{TOTAL}$**	
Variables	% HA $_{CONSISTENT}$	Percentage of the total harvest area consistent with special habitat features identified over a 5-year period.
	HA $_{CONSISTENT}$	Harvest area of cutblocks that are consistent[1] with special habitat features identified over a 5-year period.
	HA $_{TOTAL}$	Total harvest area of cutblocks where felling started[2] within an OGMA, UWR, WHA or within 50 metres from a PA over a 5-year period.
Notes	*3. Cutblocks are considered consistent if no special habitat features are identified or if specific activities are authorized prior to any alteration.*	
	4. Use cutblock felling started dates reported to MoF.	

CURRENT STATUS – Table 15 shows that 99.1% of the total harvest area was consistent with management practices to address special habitat features. This is summarized for cutblocks where felling began over the last 5 years.

Table 15 Indicator results for special habitat features.

Year	Cutblocks Requiring Special Habitat Feature Management[1]	Harvest Area Consistent[2] (ha)	Total Harvest Area (ha)	Consistent
2000	CU054, DL027, KT039A, M053	1,302.1	1,341.1	98.8%
2001	AH010H, AL021WF, CE012, KU045, MK026, NI040, NR001, TN012, VR063	1,195.3	1,195.3	
2002	BC102, CB001, D011, HR066WF, KA020, KC150, KH500, MK039, TH003, Y010H	1,896.0	1,896.0	
2003	CE037, CE042, DA325, GC024, HR155, KA043, LG216, SC015, TK015, TS001, VR065	1,195.3	1,216.2	
2004	BC196, BC199, KA006, LG214, NA111, NA112, NA113, NE032A, TK034, TS033	1,352.6	1,377.7	

1. If no special habitat feature management practices are required then the cutblock is considered consistent.
2. Harvest area of cutblocks consistent with management practices to address special habitat features.

STRATEGY AND IMPLEMENTATION SCHEDULE - Strategies to appropriately manage special habitat features are based on information already in place (e.g., National Recovery Teams of Environment Canada, Identified Wildlife Management Strategy) and on recent scientific literature. Appropriate management strategies are implemented in site level plans to ensure the development or maintenance of species' habitat.

Special habitat features are managed on a case-by-case basis as they are discovered. Bear dens, large stick nests, great blue heron colonies and active nests of other bird species are retained as they are located and where worker safety is not compromised. Additional habitat surrounding bear dens is prescribed on a site-specific basis.

MONITORING - Monitoring for this indicator is integrated with the Canfor's FMS (see section 2.2.3). Special habitat features are documented when they are located and appropriate management strategies are developed within site-level plans. These results are summarized annually in the SFM annual report.

FORECASTING – This indicator is intended to address special habitat features as they are located, therefore forecasting future proportions that are appropriately managed is not applicable.

Objective 1.2 (b) Maintain habitat for Species at Risk.

This objective is realized through indicators that address Queen Charlotte goshawk territories, Keen's Long-eared Bat hibernacula and maternity sites, and Marbled Murrelet nesting habitat.

Queen Charlotte Goshawk

Indicator	*Target*	*Acceptable Variance*
11. Area conserved for Queen Charlotte goshawk.	At least 2,000 ha are conserved for Queen Charlotte goshawk nesting and post-fledgling areas.	-5% of the target.

JUSTIFICATION – COSEWIC designated the Queen Charlotte Goshawk as Vulnerable in 1995 (Duncan and Kirk 1995), but recently upgraded its status to Threatened (Cooper and Chytyk 2000). On June 4, 2003 the Federal Species at Risk Act (SARA) received Royal Ascent. This Act is intended to protect habitat for species at risk. Queen Charlotte Goshawk is listed on Schedule 1 of SARA and requires a recovery strategy by June 2006.

Provincially, The BC CDC ranks the Queen Charlotte Goshawk as S2B, SZN (imperilled in BC due to rarity and perceived threats to habitat). The Queen Charlotte Goshawk is currently on the BC "Red List" as a candidate species for Endangered or Threatened status (MWLAP 2001).

On February 18, 1999, the BC government announced Volume 1 of the IWMS (MoF and MoELP 1999). An updated version (IWMS Version 2004) was announced in June 2004. IWMS Version 2004 concentrated on species that are listed on Schedule 1 of the Federal Species at Risk Act.

Identified Wildlife are considered to be sensitive to habitat alteration associated with forest and range practices and are considered to be at risk (endangered, threatened, vulnerable or regionally important). The IWMS is able to help species at risk by protecting significant habitats and providing species specific practices to manage those habitats. Wildlife Habitat Areas are a mechanism under IWMS Version 2004 for protecting goshawk nesting and post-fledgling areas. In locations where WHAs are not possible, goshawk nests can be protected as a Wildlife Habitat Feature or a Wildlife Tree Patch (WTP).

DETAILS – This indicator is measured as the total area of productive forest conserved as nesting and post-fledgling areas for Queen Charlotte Goshawk. The area conserved must meet or exceed the target of 2,000 hectares.

CURRENT INFORMATION - In 1993, Canfor began recording sightings of all raptors. In 1994, Canfor assisted Government in conducting the first formal goshawk surveys on the Nimpkish DFA. One territory was located. Between 1995 and 2002, Canfor partnered with Government and other forest companies to conduct inventory and research on Queen Charlotte Goshawks, including defining post-fledgling areas.

Forty-three nest sites (14 potential territories) have been identified to date (current to July 2004) on the Nimpkish DFA. In March 2002 Canfor submitted for government approval, 10 wildlife habitat areas each $\geq$100 ha in size and totalling 2,762 ha. These WHAs are linked closely to the implementation of an adaptive management strategy developed by Canfor (Manning et al. 2004) that (i) assesses the problems and uncertainty with the IWMS approach to goshawk management; (ii) sets objectives; (iii) designs a strategy (i.e., establish goshawk conservation areas) and an implementation plan to achieve the objectives; (iv) monitors goshawk productivity at the stand-level and habitat at the landscape level; (v) evaluates the outcome of the strategy (i.e., using territory occupancy and annual nest productivity as measurable indicators of the success of the strategy); and (vi) adjusts the strategy if necessary. Throughout the strategy development, efforts have been made to minimize the AAC impacts of goshawk management on the Nimpkish DFA in order not to jeopardize other indicators. In March 2003, government approved the WHAs.

In addition to post-fledgling areas conserved under the adaptive management (AM) strategy, Canfor has proposed OGMAs to conserve a portion of the post-fledgling area habitat for Sutton territory and nest area habitat for the Tlakawa territory.

STRATEGY AND IMPLEMENTATION SCHEDULE – As stated in the previous section, Canfor has developed and implemented an AM strategy for goshawks on the Nimpkish DFA.

MONITORING - Monitoring will focus on loss of habitat due to natural events. Monitoring habitat quality is not a priority because the forest condition is not expected to change significantly from the natural disturbance processes, and the winter ranges are comprised of long-lived tree species. Rather, habitat supply is monitored spatially relative to the target every 5 years.

FORECASTING - All goshawk nests on the Nimpkish DFA are located below 750 m elevation, in wide valleys or near lakes within the CWHxm2, CWHmm1 and CWHvm1 variants, and in forests ≥50 years old (assuming high site index). Generally, there is approximately 5-7 km spacing between active goshawk nests. Nests are located on the valley bottom or on naturally occurring benches on steeper slopes. Based on the best available information, Canfor developed a habitat suitability model incorporating various forest structural and biophysical variables (e.g., forest age class, forest composition, canopy closure, site index, and BEC unit).

Keen's Long-Eared Bat

Indicator	*Target*	*Acceptable Variance*
12. Area conserved for Keen's Long-eared Bat hibernacula and maternity sites.	At least 200 ha are conserved for Keen's Long-eared Bat hibernacula and maternity sites.	-10% of the target.

JUSTIFICATION – COSEWIC down-listed the Keen's Long-eared Bat as data deficient in November 2003 (COSEWIC 2003). Provincially, The BC CDC lists the Keen's Long-eared Bat as Red-listed. It is also included in IWMS Version 2004.

Both hibernacula (winter denning) and maternity roosts (i.e., rearing young) are critical ecological/habitat components for Keen's long-eared Bat. In the Nimpkish DFA, Keen's long-eared bat has been found in caves in karst landforms. While no maternity roosts have yet been confirmed for Keen's long-eared bat in the Nimpkish DFA, Keen's Bat are known to raise their young communally, often using warm caves, rock crevices, or trees on warm aspects. Both hibernacula and maternity roosts may contain many individuals, consequently it is important to protect these features when discovered.

DETAILS – This indicator is measured as the total area of productive forest conserved as hibernacula and maternity sites for Keen's Long-eared Bat. The area conserved must meet or exceed the target of 200 hectares.

CURRENT STATUS - In 1995, Canfor initiated a one-year project to inventory bats on the Nimpkish DFA. The research questions resulting from this inventory formed the basis of a three-year habitat study on bats that began in 1996. During the study, two long-eared bats (Keen's and Western long-eared bats are morphologically identical) were captured and were fitted with a radio-transmitter that lead to the discovery of 2 maternal sites in trees. Both maternal roost trees were located on steep, southerly slopes. It is expected that Canfor's ungulate winter range strategy, which identified 59 deer winter ranges (5,205 ha), on steep southerly slopes, will provide maternal habitat options throughout the DFA. Additional habitat will be provided on southerly slopes within PAs and OGMAs.

To date, Canfor has identified 4 caves on the Nimpkish DFA that contained Keen's long-eared bats. Two proposed OGMAs (34 ha and 249 ha) were adjusted to encompass and maintain the habitat features. In addition, a long-eared bat maternal roost tree located in 1996 is within a 75 ha Ungulate Winter Range.

STRATEGY AND IMPLEMENTATION SCHEDULE - To date, WHAs have not been established nor proposed for Keen's long-eared Bat. As stated above, Canfor has proposed two OGMAs around the four cave entrances where long-eared bats were detected. Government has not yet approved these OGMAs, however, approval is expected in September 2005. Future Keen's long-eared bat maternal sites and hibernacula will be managed through wildlife tree patches (~100m radius or area equivalent).

MONITORING – Monitoring will focus on loss of known hibernacula and known maternity sites due to natural events. Monitoring habitat quality is not a priority because the forest condition is not expected to change significantly from the natural disturbance processes, and the winter ranges are comprised of long-lived tree species. Rather, habitat supply will be monitored spatially relative to the target every 5 years.

FORECASTING – Forecasting for hibernacula and maternity sites is not required since these are stand-level habitat elements, and cannot be accurately predicted through modelling.

Marbled Murrelet

Indicator	Target	Acceptable Variance
13. Area conserved for Marbled Murrelet nesting habitat.	At least 14,000 ha are conserved for Marbled Murrelet nesting habitat.	-3% of the target.

JUSTIFICATION - Marbled Murrelets are listed as "Threatened" by COSEWIC, and the BC government has red-listed the marbled murrelet and has classified it as an Identified Wildlife species. Marbled Murrelets have also been listed as indicators of healthy old growth ecosystems by the CCFM (see Table 6). Therefore, they are a good indicator of SFM.

DETAILS – This indicator is measured as the total area of productive forest conserved as nesting for Marbled Murrelet. The area conserved must meet or exceed the target of 14,000 hectares. Approximately 6,900 ha is located in Provincial PAs within the Nimpkish DFA and the remaining 7,100 ha is based on the Dec 2004 Section 7 Species at Risk notice for the North Island-Central Coast District.

CURRENT STATUS – Canfor developed and implemented a nesting habitat conservation strategy in January 2005. Canfor's target is to maintain $\geq$14,000 ha of suitable habitat (based on low-level aerial reconnaissance habitat mapping Class 1-4) across the Nimpkish DFA. This strategy is built on data that has been collected from TFL 37 since 1992 when Canfor began conducting inventory, research and monitoring of both Marbled murrelet and its' habitat. The three key pieces of information used to develop the strategy are: (i) low-level aerial reconnaissance habitat mapping; (ii) dawn audio-visual surveys and (iii) radar monitoring. The intent of Canfor's strategy is to identify drainages with high Marbled Murrelet use and focus conservation efforts in these areas.

STRATEGY AND IMPLEMENTATION SCHEDULE –Canfor identified seven potential strategies for managing Marbled Murrelet Nesting habitat on the Nimpkish DFA. They are: OGMAs and PAs (base case); 35% of 2002 habitat; 40% of 2002 habitat; 45% of 2002 habitat; 50% of 2002 habitat; 59% of 2002 habitat; and 69% of 2002 habitat. Habitat was classified using low-level aerial reconnaissance mapping and classes 1 (Very High) to 4 (Low) were considered suitable habitat. The 69% option was selected as a scenario since it was the recommendation from Part B of the Marbled Murrelet Conservation Assessment prepared by the Canadian Marbled Murrelet Recovery Team. Canfor selected the 35% and 50% options because these scenarios were used in Part C (Risk Analysis) of the Marbled Murrelet Conservation Assessment. The 40% and 59% options were selected by Canfor based on data from the Sunshine Coast that 10-12% of the nests found by radio-telemetry were located in areas not classified as suitable habitat based on air photo interpretation. The objectives of this analysis are to (i) determine the quantity and quality of nesting habitat, retained by selected habitat retention options (including Part B), and (ii) determine the timber supply impact of each option.

Canfor retained Forest Ecosystem Solutions Ltd to determine the timber supply impact of each of the management options. The Marbled Murrelet base case simulates current management in TFL 37, and includes spatially defined OGMAs. Six scenarios are tested where progressively greater proportions of the identified potential Marbled Murrelet nesting habitat are removed from the THLB.

Results are summarized in Table 16. In all scenarios, the greatest timber impacts occur in the medium term. Options 59 and 69 are the only scenarios with any effect on the initial harvest level. Long term impacts show a similar pattern to the medium term impacts, but are not as pronounced. A key assumption of the timber supply analysis was to maintain the initial harvest level at the current AAC. This strategy exacerbated the medium-term impacts. Reducing the initial harvest level in any scenario would dampen the medium term impacts.

Table 16 Summary of results of the Marbled Murrelet timber supply scenarios.

Scenario	MAMU Option	% of potential MAMU Habitat	Total Area (ha)	THLB Area (ha)	% Change in THLB (relative to base case)	Timber Supply Impacts on Harvest Rate		
						Initial	Medium Term	Long Term
Base	Option A (OGMAs)	31%	16,120	2,512	0.0%			
1	Option 35	35%	17,606	3,646	-1.2%	0%	2%	1%
2	Option 40	40%	19,541	5,134	-2.8%	0%	5%	2%
3	Option 45	45%	22,333	7,571	-5.3%	0%	11%	4%
4	Option 50	50%	24,211	9,280	-7.1%	0%	17%	5%
5	Option 59	59%	27,570	12,619	-10.6%	5%	21%	8%
6	Option 69	69%	32,090	16,586	-14.8%	12%	30%	12%

Canfor's preferred strategy is based on the 50% habitat retention option but modified to reduce the overall AAC impact by maximizing the suitable nesting habitat within the NHLB and utilizing the HLB only where it was justifiable based on high Marbled Murrelet dawn audio-visual detections (both occupied and auditory detections). As a result, the timber supply impact is similar to the 35% option. By focusing habitat conservation within watersheds with high murrelet detections, Canfor's goal to achieve the Canadian Marbled Murrelet Recovery Team's population objective of 69% of the 2002 population, while conserving 50% of the 2002 habitat, is met.

A total of 21,565.6 ha of potential Class 1-4 Marbled Murrelet habitat will be conserved by this plan. A total of 6,988.2 ha are located in protected areas, 6,882.1 ha as Marbled Murrelet conservation areas, 1,758.3 ha within OGMA that is not part of the conservation areas, and 7,606 ha as incidental retention within the non-harvesable landbase. This total represents 50.4% of the Class 1-4 2002 habitat. Canfor implemented the strategy on January 1, 2005.

MONITORING – Monitoring will focus on loss of habitat due to natural events. Monitoring habitat quality is not a priority because the forest condition is not expected to change significantly from the natural disturbance processes, and the winter ranges are comprised of long-lived tree species. Rather, habitat supply will be monitored spatially relative to the target every 5 years.

FORECASTING – Canfor assumes that once Conservation Areas have been established for Marbled Murrelet nesting, they will remain as such in the long term. This assumption is reasonable because of the old growth characteristics of the conservation areas, and the long intervals between natural disturbances in the ecosystems where most of the conservation areas are found.

All 7 management options described above were forecasted for timber supply impact over the short, mid and long-terms.

Objective 1.2 (c) Maintain native tree species diversity at the landscape level.

This objective is realized through an indicator that addresses free-growing stand establishment.

Free-Growing Stand Establishment

	Indicator	*Target*	*Acceptable Variance*
14.	Percent of forest area surveyed as acceptable free growing stands and proportion that indicates more than one suitable native tree species.	Over a 5-year period, at least 95% of the forest area surveyed are acceptable free growing stands while all inventory labels for these stands indicate more than one suitable native tree species.	-5% of the target.

JUSTIFICATION – Coastal forest stands are most often composed of multiple tree species. Regenerating forest stands with a diversity of native tree species is important for managing biodiversity at the stand level.

DETAILS – The minimum target of more than one suitable native tree species (without attaching a minimum percentage of each species) is valid when considering that often-natural disturbances (fire and wind throw) will produce near pure stands of one species with only a minor component of a second species. This is due to natural competition strategies and silvics of the various species (for example; 1908 hurricane stands on TFL 37 are nearly 100% hemlock).

Percent free growing is determined through an annual query of Canfor's silviculture database, as follows:

Calculation	**% FG $_{ACCEPTABLE}$ = FG $_{ACCEPTABLE}$ / FG $_{TOTAL}$**	
Variables	% FG $_{ACCEPTABLE}$	Percent acceptable[1] free growing stands over a 5-year period.
	FG $_{ACCEPTABLE}$	Total area of cutblocks surveyed as acceptable[1] free-growing stands over a 5-year period.
	FG $_{TOTAL}$	Total area surveyed 5-year period for free growing status.
Notes	*1. Acceptable is defined as meeting the free growing stocking standards defined for each Standards Unit in the Site Plan or Silviculture Prescription.*	

The proportion of stands assessed with more than one suitable native tree species is determined through an annual query of Canfor's silviculture database, as follows:

Calculation	**% >1 SPS = >1 SPS $_{ACCEPTABLE}$ / FG $_{ACCEPTABLE}$**	
Variables	% >1 SPS	Percent multiple suitable native tree species[1] over a 5-year period.
	>1 SPS $_{ACCEPTABLE}$	Total area surveyed as acceptable free growing stands with more than one suitable native tree species[1] over a 5-year period.
	FG $_{ACCEPTABLE}$	Total area surveyed as acceptable[2] free growing stands over a 5-year period.
Notes	*3. Suitable native tree species includes acceptable tree species. While Nobel Fir is not native to TFL 37, it is acceptable on BEC Variants that are found in TFL 37.* *4. Acceptable is defined as meeting the free growing stocking standards defined for each Standards Unit in the Site Plan or Silviculture Prescription.*	

CURRENT STATUS – Each year Canfor completes free growing surveys; gathering various information, including species composition, about newly regenerated stands. Table 17 shows that all areas surveyed in the past 2 years indicate more than one suitable native tree species.

Table 17 Indicator results for free growing stand establishment.

Year	Ha Surveyed	% FG	% >1 Suitable Species
2002	1,938.1	98.0%	100%
2003	1,692.3	99.7%	100%
2004	783.8	96.1%	100%

STRATEGY AND IMPLEMENTATION SCHEDULE – Canfor currently plants 100% of all areas logged with tree species that are ecologically suited to each site condition. To increase diversity, this typically involves planting a mix of tree species, while additional species, typically hemlock, Amabilis fir, cedar and western white pine, regenerate naturally. In the future, Canfor will explore opportunities to naturally regenerate openings in the CWHvm2 and MHmm1 and fill planted where required. Furthermore, a diversity of non-commercial tree species, including hardwoods, is also retained within the NHLB.

All areas are assessed the year following planting and any Not Satisfactorily Restocked (NSR) sites are replanted as soon as possible. Canfor conducts surveys of all newly regenerated stands to ensure that appropriate tree species

are established and that stocking is achieved within the range of acceptable free growing dates indicated on the site plan or silviculture prescription (SP). All areas are surveyed according to applicable stocking standards using MoF survey methods. This typically involves:

- *Regeneration surveys within three years of harvest completion.*
- *A free-growing survey within 11 years of harvest completion.*

As required, specialized assessments for planting survival and brush competition are conducted to ensure that site productivity and site occupancy is maximized.

MONITORING – Free growing surveys are scheduled and tracked in Canfor's silviculture database and results are electronically reported to the MoF. Tree species composition for areas within regenerated cutblocks is annually monitored and reported from these surveys.

FORECASTING – Forecasting is not applicable for this indicator as any shortfalls in stocking and species composition are tracked through surveys and fill-planted where required.

Objective 1.2 (d) Minimize potential negative effects of resource development on aquatic habitat.

This objective is realized through an indicator that addresses significant riparian management impacts identified.

Riparian Management

	Indicator	*Target*	*Acceptable Variance*
15.	Number of medium to high significant non-compliances/ non-conformances with riparian management impacts.	No high significant non-compliances/ non-conformances with riparian management impacts.	To be determined following several years of results.

JUSTIFICATION - Riparian areas occur next to the banks of streams, lakes, and wetlands, and include both the area dominated by continuous high moisture content and the adjacent upland vegetation that exerts an influence on it. A natural riparian ecosystem will vary in width and shape along its length as conditions change. A riparian area is also considered to be three-dimensional by extending outward from the high water mark as well as upward into the canopy.

Riparian ecosystems contain many of the highest value non-timber resources in the natural forest. Streamside vegetation protects water quality and provides a "green zone" of vegetation that stabilizes stream banks, regulates stream temperatures, and provides a continual source of woody debris to the stream channel. The majority of fish food organisms come from overhanging vegetation and bordering trees, while leaves and twigs that fall into streams are the primary nutrient source that drives aquatic ecosystems. Riparian areas frequently contain the highest number of plant and animal species found in forests, and provide critical habitats and travel corridors for wildlife. Biologically diverse, these areas maintain ecological linkages throughout the forest landscape, connecting hillsides to streams and upper headwaters to lower valley bottoms. There are no other landscape features within the natural forest that provide the natural linkages of riparian areas.

DETAILS – Canfor's FMS defines both medium and high significant incidents (see Abbreviations and Definitions section 10.0). For this indicator, medium significant issues are tracked to identify performance trends, while the target is assigned only for high significance incidents.

CURRENT STATUS – Both Canfor and government agencies routinely monitor and inspect regulatory requirements around riparian management at various stages in the cutblock planning process. Practices are also verified for compliance and conformance through internal and external audits. Incidents that do not comply are reported and tracked through Canfor's incident tracking system (ITS) database. Table 18 shows the recorded riparian management incidents since 2003, when improved standards for reporting were introduced.

Table 18 Indicator results for riparian management.

Year	# of Non-Compliances or Non-Conformances [1]	
	Medium Significance	High Significance
2003	4	0
2004	2	0

1 Medium/high significance is defined in the Abbreviations and Definitions section 10.0

STRATEGY AND IMPLEMENTATION SCHEDULE - During road and cutblock planning, streams adjacent to and within the planned operating area are assessed and classified according to Canfor's internal stream classification procedures. Prescriptions are developed based on this classification to address biological diversity and riparian management objectives. Prior to harvesting, these prescriptions are professionally reviewed internally.

MONITORING – As part of Canfor's FMS (see section 2.2.1), monitoring for this indicator is done through the ITS. Descriptions of all non-compliance and non-conformance reports of Canfor's operations from external and internal sources are tracked in ITS and summarized each year and medium and high significant incidents impacting riparian management are reported in the SFM annual report.

FORECASTING – Forecasting is not applicable for this indicator as occurrences of significant non-compliance and non-conformance incidents are unpredictable.

Value 1.3 Genetic Diversity

Biological diversity is promoted by maintaining genetic diversity. Seven indicators are used to assess the following objective developed for this value: conserve genetic diversity.

Objective 1.3 (a) Conserve genetic diversity across the Nimpkish DFA

This objective is realized through indicators that address ecosystem representation in the NHLB, old growth forest management, and registered seed.

Ecosystems in the Non-Harvestable Forest Landbase

Maintaining a variety of forest ecosystems contributes to provide genetic diversity. Conserving an appropriate representation of forest ecosystems then, is an appropriate coarse-filter approach towards conserving genetic diversity across the Nimpkish DFA. Ecosystem representation is addressed through indicator 1 (percent non-harvestable forest by ecosystem groups) and its associated target on page 15.

Old Growth Management Areas

Old growth forests provide a diverse variation of genes within species. Conserving an appropriate representation of areas managed for old growth forest then, is an appropriate coarse-filter approach to conserving genetic diversity across the Nimpkish DFA. Old growth representation is addressed through indicator 3 (percent OGMA by BEC variant within LUs) and its associated target on page 20.

Registered Seed

Indicator	*Target*	*Acceptable Variance*
16. Percent of trees planted from MoF registered seed.	All seed and seed sources used for reforestation over any 5-year period is MoF registered.	Not acceptable.

JUSTIFICATION - A primary method for preserving genetic diversity in trees is to use genetically diverse seed stock. Canfor secures an appropriate supply of ecologically suitable and genetically improved seed/hedge to satisfy projected seedling requirements for its bi-annual planting programs.

DETAILS – Percent of MoF registered seed used is determined through an annual query of Canfor's silviculture database, as follows:

Calculation	**% PLANT $_{REGISTERED}$ = PLANT $_{REGISTERED}$ / PLANT $_{TOTAL}$**	
Variables	% PLANT $_{REGISTERED}$	Percent of trees sown from MoF registered seed[1] that are planted over 5 years.
	PLANT $_{REGISTERED}$	Number of trees sown from MoF registered seed[1] that are planted over 5 years.
	PLANT $_{TOTAL}$	Total number of trees planted over 5 years.
Notes	*1. Trees planted using MoF registered seed are confirmed through SPAR (see Monitoring section below)*	

CURRENT STATUS - Each year, Canfor completes an analysis of seed requirements for reforestation. This analysis is based on site types and elevations projected in annual harvest plans, allowing Canfor to adjust seed purchase and/or collection strategies accordingly. Table 19 shows that seed and seed sources used in the past 5 years were all MoF registered.

Table 19 Indicator results for registered seed.

Planting Year	Number of Trees Planted with Registered Trees	Total Number of Trees Planted	Current %
2000	1,573,962	1,573,962	
2001	1,520,296	1,520,296	
2002	1,296,078	1,296,078	100%
2003	1,356,253	1,356,253	
2004	1,336,739	1,336,739	

STRATEGY AND IMPLEMENTATION SCHEDULE - The supply of genetically improved seed for western hemlock, high elevation Douglas-fir and western white pine is currently provided by three producing orchards at Canfor's Sechelt Seed Orchard site. Low elevation Douglas-fir and western redcedar orchards are under development at Sechelt. Current needs are met with purchases from other private producers.

The objectives of Canfor's ten-year tree improvement plan are as follows:

- *Double the current volume gain or pest resistance of material out-planted on the Nimpkish DFA for each species that has a MoF breeding program.*
- *Manage all current orchards to maximize breeding values until new and developing orchards replace them.*
- *Increase production to provide all western hemlock, Douglas-fir, western white pine, western redcedar and yellow-cedar needs.*
- *Minimize risk to wood quality objectives and/or genetic diversity across the landscape.*

In addition to supporting the MoF tree breeders by providing test seed and sites, Canfor is also a proponent of the following research trials to help achieve the above objectives:

- *Conduct a progeny test of Canfor's high elevation Douglas-fir orchard.*
- *Determine the field rust resistance value of Canfor's western white pine orchard.*
- *Determine differences between growth characteristics of western hemlock rooted cuttings versus seedlings from the same high gain families.*
- *Compare weevil resistance and growth patterns of resistant Sitka spruce seed lots, cuttings and somatic seedlings in the field.*
- *Develop large amounts of yellow-cedar cuttings through tissue culture.*

Seed supplies for reforestation are maintained through:

- *Collections from the forest for non-genetically improved (B class) seed for amabilis fir and yellow-cedar.*
- *Production from Canfor's seed orchard for genetically improved (A class) Douglas-fir, western hemlock, white pine and western redcedar.*
- *Purchase of A and B class seed of various species from other forest companies and the MoF.*

MONITORING - Canfor orders all of its seed through the MoF SPAR system and all seedlings planted are reported electronically back to the MoF. This double check system ensures that the seed used is MoF registered. This data is summarized annually in the SFM annual report.

FORECASTING - Forecasting is not applicable for this indicator as seed requirements are prescribed at a stand level based on annual harvest plans.

Value 1.4 Protected Areas and Sites of Special Biological Significance

Biological diversity is promoted by maintaining areas of biological significance. Two indicators are used to assess the following objective developed for this value: conserve protected areas and sites of special biological significance.

Objective 1.4 (a) Conserve Protected Areas and Sites of Special Biological Significance.

This objective is realized through indicators that address activities in protected and biologically significant areas, and rare plants and plant associations.

Activities in Protected and Biologically Significant Areas

Indicator	*Target*	*Acceptable Variance*
17. Percent consistency with established objectives to address WHAs, OGMAs, UWRs and PAs.	All cutblocks felled over any 5-year period are consistent with established objectives to address WHAs, OGMAs, UWRs and PAs.	Not acceptable.

JUSTIFICATION – Consistency with the established objectives for WHAs, OGMAs, UWRs and PAs ensures the protection of specific features and critical habitat. Objectives designed for these areas generally allow certain types of activities to be undertaken, provided that the special features are maintained.

WHAs are areas established by government to protect critical habitat elements for one or more species of identified wildlife (see Table 6 in section 3.2). Similarly, UWRs are areas that identified as being necessary for the winter

survival of ungulate species. OGMAs are areas established under an HLP, which contains, or is managed to replace, structural old growth attributes.

Government establishes PAs under an HLP, to protect viable, representative examples of natural diversity and to set aside unique and special natural, recreational and cultural heritage features. Discontinuing most forestry-related activities within PAs maintains the conservation, recreation and cultural values for which they are established.

DETAILS – This indicator is assessed based on three planning stages:

- *Cutblocks identified within a landscape-level overview of PAs, OGMAs, UWRs or WHAs are checked for consistency with detailed surveys or variances planned.*
- *The wildlife and recreation sections in each site plan are checked for consistency with the detailed surveys or variances applied for the cutblock.*
- *Monitoring and inspection reports, public inquiries and agency reviews are checked to confirm that road construction and harvesting activities were carried out consistent with the site plan.*

Ultimately results are compiled as follows:

Calculation	**$\%\ HA_{CONSISTENT} = HA_{CONSISTENT} / HA_{TOTAL}$**	
Variables	$\%\ HA_{CONSISTENT}$	Percentage of the total harvest area consistent with objectives for WHAs, OGMAs, UWRs and PAs over a 5-year period.
	$HA_{CONSISTENT}$	Harvest area of cutblocks that are consistent[1] with objectives for WHAs, OGMAs, UWRs and PAs over a 5-year period.
	HA_{TOTAL}	Total harvest area of cutblocks where felling started[2] within an OGMA, UWR, WHA or within 50 metres from a PA over a 5-year period.
Notes	*1 Cutblocks are considered consistent if they are not within a PA, OGMA, UWR or WHA or if specific activities are authorized by MWLAP or MSRM.*	
	2 Use cutblock felling started dates reported to MoF.	

CURRENT STATUS – Each year Canfor summarizes applicable activities within WHAs, OGMAs, UWRs and PAs. Table 20 shows that all forest activities over 5 years were consistent with established objectives.

Table 20 Indicator results for activities in protected and biologically significant areas.

Year	Cutblocks Requiring Consideration of WHA, OGMA, UWR or PA Objectives[1]	Harvest Area Consistent[2] (ha)	Total Harvest Area (ha)	% Consistent
2000	DL027, HT017, HT018B, MK037, NR003, W032	1,341.1	1,341.1	
2001	J015, KT163, SB409H	1,195.3	1,195.3	
2002	CE003, HR153, KA202, LG001, LM015, P032, Q210, R122, SW053WF, W026WF	1,896.0	1,896.0	100.0%
2003	HR155, NA300	1,216.2	1,216.2	
2004	CA025, K183, K207, KH074, KT021, LG205, NA112	1,377.7	1,377.7	

1 For some blocks, WHA, OGMA, UWR or PA objectives may overlap.
2 Harvest area of cutblocks consistent with objectives for WHAs, OGMAs, UWRs and PAs.

STRATEGY AND IMPLEMENTATION SCHEDULE – Locations of PAs, OGMAs, WHAs, and UWRs are maintained within the Geographic Information System (GIS) and referred to on harvest plans. Canfor ensures its road and harvesting activities are consistent with objectives by first identifying activities proposed near or within these areas and then applying and verifying various procedures from its FMS.

MONITORING – Annually, activities identified within PAs OGMAs, UWRs or WHAs, are identified spatially through a GIS exercise. These activities are verified for consistency and summarized in the SFM annual report.

FORECASTING – Forecasting is not applicable for this indicator as specific activities within or near these areas are not determined until annual road and harvest plans are completed.

Rare Plants and Plant Associations

Indicator	*Target*	*Acceptable Variance*
18. Percent consistency with management practices to address rare plants and plant associations.	All cutblocks felled over any 5-year period are consistent with management practices to address rare plants and plant associations.	-5% of the target.

JUSTIFICATION – To a large degree, coarse filter approaches like ecosystem representation and old growth management areas are appropriate for ensuring sensitive plant associations are sustained. However, coarse filter guidelines alone are not sufficient to conserve specific rare plants and plant associations. Specific management guidelines are therefore required.

The list of rare plants and plant associations of potential management concern (see Table 7) is integrated within the ecosystem representation component of indicator 1 (percent non-harvestable forest by ecosystem groups) on page 15. At a landscape-level, this identifies potential areas of management concern where strategies to conserve rare plants and plant associations may be appropriate. This strategy is generally based on conserving at least 30% of the identified plant associations within the NHLB.

DETAILS – This indicator is assessed at three planning stages:

- *Cutblocks identified within a landscape-level overview of rare plant and plant association potential are checked for consistency with planned assessment activities.*
- *The sensitive areas section of each site plan is checked for consideration of rare plants and plant associations. In addition, cutblocks identified with rare plant associations in the ecology section of site plans are checked for further consideration.*
- *Monitoring and inspection reports are checked to confirm that road construction and harvesting activities were carried out consistent with the site plan.*

Ultimately results are compiled as follows:

Calculation	**% HA $_{CONSISTENT}$ = HA $_{CONSISTENT}$ / HA $_{TOTAL}$**	
Variables	% HA $_{CONSISTENT}$	Percentage of the total harvest area consistent with management of rare plants and plant associations over a 5-year period.
	HA $_{CONSISTENT}$	Harvest area of cutblocks that are consistent[1] with management practices to address rare plants and plant associations over a 5-year period[2].
	HA $_{TOTAL}$	Total harvest area of cutblocks where felling started[3] over a 5-year period.
Notes	*3. If no management practices for rare plants and plant associations are required then the cutblock is considered consistent.* *4. Actual performance for this indicator will be reflected beginning 2008.* *5. Use cutblock felling started dates reported to MoF.*	

CURRENT STATUS – Table 21 summarizes data for cutblocks where felling began over the last 5 years. It shows that 81.6% of the harvest area was consistent with newly established management practices to address rare plants or plant associations.

Table 21 Indicator results for rare plants and plant associations.

Year	Cutblocks Requiring Management[1] for Rare Plants or Plant Associations	Harvest Area Consistent[2] (ha)	Total Harvest Area (ha)	% Consistent
2000	K303, KT039A, M060, NR003, NW029, NW056D, NW090WF, NW393, VR059	1,045.3	1,341.1	81.6%
2001	KU045, MK026, ML004, NI024, NI044, NW111	949.9	1,195.3	
2002	KH312C, KH500, ME001, MK039, MU100, NA100, NW074WF2, VR061WF, WE005	1,676.5	1,896.0	
2003	BC200, CU052, KT141, ME035, ME100, MU119H, NE005, NE016A, NE100, NW582H, NW582HA, Q019	907.3	1,216.2	
2004	GC001, KH074, KH400, ME030, NE032A, NE102, NE105, NW902, NW904, VR057	1,155.0	1,377.7	

1 *List of cutblocks requiring consideration of rare plants and plant associations. Note that this is a retrospective examination where internal management practices were not yet in place. Actual performance for this indicator will be reflected beginning 2008.*

2 *Number of cutblocks consistent with strategies identified in SPs to conserve rare plants and plant associations.*

Since internal management practices were yet not in place, this retrospective examination is strictly intended to reflect the magnitude of blocks where the potential for rare plants and plant associations was identified. In fact, due to the time lag between designing and harvesting cutblocks, implementation of the management practices will begin in 2005 while actual performance for this indicator will be reflected beginning 2008.

STRATEGY AND IMPLEMENTATION SCHEDULE – Rare plants and plant associations are managed in concert with initiatives discussed under indicator 1 (percent non-harvestable forest by ecosystem groups) on page 15. Priority ecosystem groups are identified to improve representation and planners will consider appropriate strategies, where possible. An overview map identifies potential areas for rare plants and plant associations within the Nimpkish DFA. Canfor conducts field assessments when a proposed cutblock or road is located within areas identified with potential rare plants and plant associations. This assessment includes:

- *Establishing the general bounds of the ecosystem groups potentially associated with the proposed development activity;*
- *Conducting a ground search of appropriate intensity;*
- *Identifying and documenting any rare plants or plant associations found through measurement, narrative descriptions, illustrations and photography;*
- *Mapping the locations of rare plants and plant associations.*

Canfor then recommends measures to mitigate impacts to these features. These typically include modified approaches for establishing WTPs in mature and old stands > 140 years (structural stages 6 and 7), as discussed for indicator 4 (percent wildlife tree retention by BEC subzone within LUs). As necessary, Canfor prescribes appropriate management practices in SPs.

MONITORING – An annual survey will be conducted to ensure harvested cutblocks within potential areas with rare plants and plant associations were identified and considered. All site-level plans are subject to internal and external inspections. Non-conformances and non-compliances in relation to the plan are communicated to Canfor's Operations Planning Foresters, who will take actions to remedy the particular situations. Assessments for rare plants and plant associations are tracked in a silviculture database and prescriptions are considered, as site-level plans are prepared. Monitoring for consistency is summarized in the SFM annual report.

FORECASTING – Rare plants and plant associations are considered as reductions to the THLB in the periodic timber supply analysis completed for the Nimpkish DFA (see Appendix IV). Cutblock layout and SP preparation considers the assessment for rare plants and plant associations. It is not appropriate to forecast this indicator, as Canfor's consistency with management practices for rare plants and plant associations is simply a management decision.

Criterion 2. Maintain and Enhance Forest Ecosystem Condition and Productivity

This criterion seeks to conserve forest ecosystem condition and productivity by maintaining the health, vitality and rates of biological production. Specific elements include forest ecosystem resilience and productivity. Specific values identified are: a) a resilient forest ecosystem, b) a healthy forest, and c) a productive forest ecosystem.

Value 2.1 A Resilient Forest Ecosystem

Maintaining and enhancing forest ecosystem condition and productivity is promoted by maintaining a resilient forest ecosystem. Three indicators are used to assess the following two objectives developed for this value: a) allow ecosystems to recover from disturbance and stress b) minimize forest regeneration failure.

Objective 2.1 (a) Maintain natural range of variability in ecosystem function, composition and structure, which allows ecosystems to recover from disturbance and stress.

This objective is realized through an indicator that addresses ecosystem representation in the NHLB.

Ecosystems in the Non-Harvestable Forest Landbase

Maintaining forest ecosystem process and condition allows them to recover from disturbance and stress. Conserving an appropriate representation of ecosystems then, is an appropriate coarse-filter towards maintaining a natural range of variability in ecosystem function, composition and structure. Ecosystem representation is addressed through indicator 1 (percent non-harvestable forest by ecosystem groups) and its associated target on page 15.

Objective 2.1 (b) Minimize forest regeneration failure.

This objective is realized through an indicator that addresses forest regeneration and free-growing stand establishment.

Forest Regeneration

Prompt forest regeneration is an essential component for maintaining ecosystem condition and productivity. Accordingly, successful forest regeneration efforts are required to ameliorate disturbed ecosystems. Forest regeneration is addressed through indicator 31 (percent of disturbed areas with reforestation obligations that are satisfactorily regenerated.) and its associated target on page 67.

Free-Growing Stand Establishment

Ensuring that forest regeneration efforts are successful throughout the early stages of development contributes towards maintaining ecosystem condition and productivity. Free-growing stand establishment is addressed through indicator 14 (percent of forest area annually surveyed as acceptable free growing stands and proportion that indicates more than one suitable native tree species) and its associated target on page 39.

Value 2.2 A Healthy Forest

Maintaining and enhancing forest ecosystem condition and productivity is promoted by maintaining a healthy forest. Three indicators are used to assess the following three objectives developed for this value: a) minimize uncontrolled disease, b) minimize uncontrolled fire, and c) maintain ecosystem diversity.

Objective 2.2 (a) Minimize the impact on forest resources due to uncontrolled forest disease.

This objective is realized through an indicator that addresses forest disease control.

Forest Disease Control

	Indicator	*Target*	*Acceptable Variance*
19.	Percent consistency with management practices to address forest disease.	All cutblocks felled over any 5-year period are consistent with management practices to address forest disease.	-5% of the target.

JUSTIFICATION – Deriving indefinite economic benefits from the forest depends, in part, on Canfor's ability to maintain future forest productivity. Effective forest disease control is important to ensure that site productivity in managed stands is maintained.

DETAILS – This indicator is assessed based on three planning stages:

- *Cutblocks identified within a landscape-level overview of forest disease potential are checked for consistency with assessment activities planned.*
- *The forest health section in each site plan is checked for consistency with the disease potential assessed for the cutblock.*
- *One year after harvesting is completed, a query of the silviculture database is used to confirm that forest disease management activities were carried out consistent with the site plans.*

Ultimately results are compiled as follows:

Calculation	**% HA $_{CONSISTENT}$ = HA $_{CONSISTENT}$ / HA $_{TOTAL}$**	
Variables	% HA $_{CONSISTENT}$	Percentage of the total harvest area consistent with forest disease management over a 5-year period.
	HA $_{CONSISTENT}$	Harvest area of cutblocks that are consistent[1] with management practices to address forest disease over a 5-year period.
	HA $_{TOTAL}$	Total harvest area of cutblocks where felling started[2] over a 5-year period.
Notes	*1. If no forest disease management practices are required then the cutblock is considered consistent.* *2. Use cutblock felling started dates reported to MoF.*	

CURRENT STATUS – There have been no serious landscape-level disease outbreaks on the Nimpkish DFA since the TFL was awarded in 1960. Table 22 shows that 98.5% of the total harvest area was consistent with management practices to address forest disease. This is summarized for cutblocks where felling began over the last 5 years.

Table 22 Indicator results for forest disease.

Year	Cutblocks Requiring Forest Disease Management[1]	Harvest Area Consistent[2] (ha)	Total Harvest Area (ha)	% Consistent
2000	CU050, CU054, MK037, NI042, TH001, W032, WE001, WE003	1,341.1	1,341.1	
2001	CT059, MK026, MK060, NI022, NI024, NI040, NI044, NI046, WL001	1,158.2	1,195.3	
2002	KH500, LG001, ME001, MK039, NS001, NS050, W026WF, WE005	1,884.8	1,896.0	98.5%
2003	CT032, CU052, ME035, ME100, MU091, NE005, NE016A, NE100, NE104, NS002, NS060, Q019	1,163.4	1,216.2	
2004	BC196, BC199, BC201, DA200, GC001, KH074, KH400, LG002, ME030, NE032A, NE102, NE105, NS062, SB003H, VR057	1,375.7	1,377.7	

1 Although they are included in the area summaries, cutblocks requiring measures for Hemlock Dwarf Mistletoe are too numerous to list here.
2 Harvest area of cutblocks consistent with management practices to address forest disease.

STRATEGY AND IMPLEMENTATION SCHEDULE – At the stand level, disease control prescriptions are considered during harvest planning and included in SPs. Site Plans consider hemlock dwarf mistletoe presence while root rot vulnerability potential is focused on planned cutblocks within the CWHxm. Specific activities are planned and tracked in a silviculture database, while records of surveys, plans and treatments are kept in opening files. Applicable activities are also electronically reported to the MoF.

MONITORING - Disease control measures are reported from the silviculture database, verified for consistency and summarized annually in the SFM annual report.

FORECASTING – Forecasting is not applicable for this indicator as specific disease control measures are not determined until harvest plans are completed.

Objective 2.2 (b) Minimize the impact on forest resources resulting from uncontrolled fire.

This objective is realized through an indicator that addresses fire control.

Fire Control

Indicator	*Target*	*Acceptable Variance*
20. Percent consistency with time to control a forest fire.	All forest fires observed over any 5-year period are extinguished or under control by 10:00 a.m. the day after the fire started.	-10% of the target.

JUSTIFICATION – Deriving indefinite economic benefits from the forest depends, in part, on Canfor's ability to maintain future forest productivity. Effective fire control measures are important to ensure that site productivity and forest values are maintained. Canfor investigates all forest fires that are not extinguished or under control by 10:00 a.m. the day after the fire started.

DETAILS – This indicator is assessed based on a query of Canfor's fire records. Results are compiled as follows:

Calculation	**% FIRE $_{CONSISTENT}$ = # FIRE $_{CONSISTENT}$ / # FIRE**	
Variables	% FIRE $_{CONSISTENT}$	Percentage of fires observed consistent with time to control a forest fire[1] over a 5-year period.
	# FIRE $_{CONSISTENT}$	Total number fires observed that are consistent with time to control a forest fire[1] over a 5-year period.
	# FIRE	Total number of fires observed over a 5-year period.
Notes	*1. Forest fires that are extinguished or under control by 10:00 a.m. the day after the fire started.*	

CURRENT STATUS - Table 23 shows that over the past 5 years, 94.1% of the fires observed were consistent with the target for this indicator. In fact, only one fire control response failed to be under control by 10:00 a.m. the day after the fire started.

Table 23 Indicator results for fire control.

Year	Locations Requiring Fire Control Activities	# Fires Consistent[1]	# Fires Observed	% Consistent
2000	AC192; Woss turnoff/Hwy 19; old wood dump	3	3	
2001	NW111; Debris Pile at Beaver Cove Dryland Sort.	2	2	
2002	Confluence of the Davie and Nimpkish Rivers; adjacent to rail line north of Jamie Rd; Woss Campsite; Plateau Road Area.	4	4	94.1%
2003	MK026; KU011; Beaver Cove Dryland Sort	3	3	
2004	MU193; WL001; NA111; Hwy 19 North of Woss; NE102	4	5	

1. Number of fires that were extinguished or under control by 10:00 a.m. the day after the fire started. If no fire control management practices are required then the fire is consistent.

STRATEGY AND IMPLEMENTATION SCHEDULE – As a component of the FMS, Canfor's fire control procedures are detailed in a emergency preparedness and response plan (EPRP). This plan outlines Canfor's strategy for initial response and action. Whereas the fire control plan contains specific goals, objectives and standards for the preparation and control of fire to minimize damage to forest resources. As a statement of fire policy and action, a fire control plan considers:

- *Fire weather index monitoring and interpretation*
- *Pre-suppression organization*
- *Fire detection and reporting*
- *Initial attack plan and procedures*
- *Continued attack*
- *Safe work procedures*

Each year Canfor submits a pre-organization plan to the MoF, which describes and locates Canfor's activities and provides relevant contact information.

To decrease the risk of accidental industrial fires, operations are curtailed or shut down early due to fire weather readings. Canfor's supervisors conduct ground patrols during hazardous shutdown periods. The scope of the patrols goes beyond just preventing industrial fires and includes all potential ignition sources. This is demonstrated by the fact that the patrols include inspection of campsites where personnel emphasize proper campfire and good forest fire protection habits to the public.

MONITORING - Fire reports are tracked through the ITS and are summarized annually in the SFM annual report.

FORECASTING – Canfor forecasts fire hazard throughout the fire season. Weather data is routinely collected for calculations of the Canadian Fire Weather Index. As fire hazard increases, Canfor collects fuel moisture and relative humidity data within active operating areas to provide support data for early shift or shutdown decisions.

Objective 2.2 (c) Maintain ecosystem diversity

This objective is realized through indicators that address ecosystem representation in the NHLB, old growth forest management, forest interior, wildlife tree retention, internal patch retention, single tree retention and forest influence.

Ecosystems in the Non-Harvestable Forest Landbase

Maintaining a variety of forest ecosystems contributes to provide a diversity of ecosystem processes and conditions. Conserving an appropriate representation of forest ecosystems then, is an appropriate coarse-filter approach towards maintaining ecosystem diversity. Ecosystem representation is addressed through indicator 1 (percent non-harvestable forest by ecosystem groups) and its associated target on page 15.

Forest Interior in the Non-Harvestable Forest Landbase

Maintaining forest interior contributes to provide a diversity of ecosystem processes and conditions. Conserving an appropriate representation of areas managed for forest interior then, is an appropriate coarse-filter approach towards maintaining ecosystem diversity. Forest interior is addressed through indicator 2 (percent forest interior in the non-harvestable forest by BEC variant within LUs) and its associated target on page 19.

Old Growth Management Areas

Old growth forests contribute to provide a diversity of ecosystem processes and conditions. Conserving an appropriate representation of areas managed for old growth forest then, is an appropriate coarse-filter approach to maintaining ecosystem diversity. Old growth representation is addressed through indicator 3 (percent OGMA by BEC variant within LUs) and its associated target on page 20.

Wildlife Tree Retention

Retaining wildlife trees across the landscape contributes to provide a diversity of ecosystem processes and conditions. Managing for WTR then, is an appropriate approach towards maintaining ecosystem diversity. WTR is addressed through indicator 4 (percent wildlife tree retention by BEC subzone within LUs) and its associated target on page 22.

Internal Patch Retention

Retaining internal forested patches contributes to provide a diversity of ecosystem processes and conditions. Managing for IPR then, is an appropriate approach towards maintaining ecosystem diversity. Internal patch retention is addressed through indicator 5 (percent internal patch retention by LU, EMU and BEC subzone) and its associated target (page 25).

Single tree retention

Retaining single trees within harvested areas contributes to provide a diversity of ecosystem processes and conditions. Managing for STR then, is an appropriate approach towards maintaining ecosystem diversity. STR is addressed through indicator 6 (number of single trees per hectare retained by EMU) and its associated target on page 28.

Forest Influence

Maintaining harvested areas that are influenced by the surrounding forest contributes to provide a diversity of ecosystem processes and conditions. Managing for forest influence then, is an appropriate approach towards maintaining ecosystem diversity. Forest influence is addressed through indicator 7 (percent forest influence by EMU) and its associated target on page 30.

Value 2.3 A Productive Forest Ecosystem

Maintaining and enhancing forest ecosystem condition and productivity is promoted by maintaining a productive forest ecosystem. Five indicators are used to assess the following two objectives developed for this value: a) Maintain the productivity of forest ecosystems and b) Minimize the impact on forest resources resulting from uncontrolled fire, insect outbreak, windthrow or flooding losses.

Objective 2.3 (a) Maintain the productivity of forest ecosystems.

Ecosystem productivity is reflected in both the soils and the forest biomass. This objective is realized through indicators that address soil disturbance, forest regeneration, free-growing stand establishment, road development and forest ecosystem productivity.

Soil Disturbance

Forestry activities can influence compaction, displacement and erosion of soil resources. Ensuring that negative influences of soil disturbance are minimized assists in maintaining soil resources. Soil disturbance is addressed through indicator 25 (percent consistency with management practices to address soil disturbance) and its associated target on page 60.

Forest Regeneration

Prompt forest regeneration is an essential component for maintaining ecosystem condition and productivity. Accordingly, successful forest regeneration efforts are required to ameliorate disturbed ecosystems. Forest regeneration is addressed through indicator 31 (percent of disturbed areas with reforestation obligations that are satisfactorily regenerated) and its associated target on page 67.

Free-Growing Stand Establishment

Ensuring that forest regeneration efforts are successful throughout the early stages of development contributes towards maintaining ecosystem condition and productivity. Free-growing stand establishment is addressed through indicator 14 (percent of forest area annually surveyed as acceptable free growing stands and proportion that indicates more than one suitable native tree species) and its associated target on page 39.

Road Development

Indicator	*Target*	*Acceptable Variance*
21. Percent of the harvested area that is converted to unproductive sites for road development.	Up to 3.9% of the harvest area over any 5-year period is converted for road development.	+10% of the target.

JUSTIFICATION – This indicator is a measure of the proportion of area removed from the productive forest landbase for a long period as a result of development. Area converted to unproductive forest affects some of the key elements for a productive forest ecosystem. For example, roads eliminate or reduce the ability of that area of the landbase to support forests that contribute to ecosystem diversity, productivity, and the conservation of soil and water resources. Minimizing the area converted to roads and other structures thereby protects the forest ecosystem as a whole.

This target is based on the estimated future access requirements within the gross THLB[1] portion that is currently undeveloped. The methodology for determining this is detailed in Section 6.1.17 of Appendix III.

DETAILS – This indicator is assessed based on a spatial exercise and summaries of site degradation surveys, where road areas are presented as a ratio of the total gross cutblock area. Accordingly, the following details apply:

- *Average road widths are derived from survey data and averaged by road class (primary, secondary and spur).*
- *Road data is spatially buffered according to the class information and average road widths derived. Erroneous roads, such as those that are debuilt and put back into timber production, are removed.*
- *Road buffer information is spatially intersected against the gross area of cutblocks where felling started for a given year.*
- *Both the road area (buffer) and the remaining gross area of each cutblock are summarized.*

Percent of the harvested area converted to unproductive sites for road development is calculated for cutblocks as follows:

Calculation	**$\%\ HA_{ROAD} = HA_{ROAD} / HA_{TOTAL}$**	
Variables	$\%\ HA_{ROAD}$	Percentage of the gross area of cutblocks[1] that is converted for road development over a 5-year period.
	HA_{ROAD}	Total area converted for road development over a 5-year period.
	HA_{TOTAL}	Total gross area of cutblocks where felling started[2] over a 5-year period.
Notes	*1. Gross area is the net area to be reforested, including clearcut and selection area plus reserves.* *2. Use cutblock felling started dates reported to MoF.*	

CURRENT STATUS – Table 3 of Appendix III shows a reduction of 3,180 hectares (1.6%) of the Nimpkish DFA for existing roads.

Appropriate road width surveys completed from 2002 to 2004 indicate that average road widths were 12.27m, 11.38m and 10.40m for primary, secondary and spur road classes, respectively.

Table 24 shows the annual and periodic rolling average of the landbase converted to unproductive sites for road development. Over the past 5 years, 4.10% of the productive area within harvested cutblocks is converted into unproductive area for road development. Although this exceeds the target of 3.9%, these results are within the acceptable variance for this indicator.

Table 24 Indicator results for road development.

Year	Total Road Area (ha) [1]	Total Gross Area (ha) [2]	Road Area Ratio (%)	Current % Performance
2000	61.1	1,560.8	3.92%	
2001	59.0	1,417.9	4.16%	
2002	89.9	2,196.2	4.09%	4.10%
2003	60.5	1,423.5	4.25%	
2004	66.2	1,616.1	4.10%	

1 Summarized for permanent roads within the gross area of cutblocks
2 Summarized for gross area of cutblocks by year that felling started

STRATEGY AND IMPLEMENTATION SCHEDULE – Planners consider road development targets as they prescribe ecologically and economically appropriate harvest systems for each cutblock. Following the harvest of each

[1] *Gross THLB is the sum of the total area of polygons that are wholly or partially available for harvest (e.g., terrain class IV, potential karst, riparian, wildlife tree patches), but excludes the total area of polygons that are completely netted out (e.g., protected aras, inoperable areas, wildlife habitat areas).*

cutblock, surveys are conducted to measure the actual area of roads within the cutblock. Where it is operationally and ecologically appropriate, road rehabilitation may be required to minimize the road area. In fact, for the same time frame give in Table 24, Canfor rehabilitated 5.3 kilometres of road back into productive forest area.

To investigate seedling productivity on rehabilitated roads, a multi-year study was started in 1995, monitoring survival and growth relative to surrounding planted trees. In general, Douglas-fir is performing well on roads while yellow-cedar is performing better on controls. Pooling of results across all sites and species shows that there is no significant difference in survival and growth between roads and control (1999 TFL 37 Annual Report).

MONITORING – As roads are planned, constructed, deactivated and rehabilitated, detailed road information is maintained in a database that is periodically used to report overall lengths by road type (i.e., primary, secondary, spur, railway). Road widths are routinely measured following harvest to provide appropriate assumptions on average road widths.

FORECASTING – Assumptions for future road requirements are extrapolated from the proportion of roads over areas that are currently developed. Furthermore, future road construction will involve only secondary and spur roads, as no additional mainline roads are required. Accordingly, future road development of 3.9% is considered in the information package and timber supply analysis for SFM plan 9 (Appendix III and IV).

Forest Ecosystem Productivity

Indicator	*Target*	*Acceptable Variance*
22. Average site index of identified trees within change monitoring inventory plots.	Report the average site index of identified trees within change monitoring inventory plots.	Not required.

JUSTIFICATION – Forest ecosystem productivity is a term used to describe the ability of a forest site to sustain healthy tree and vegetation growth. Ideally, it reflects the combined effects of physical, chemical and biological conditions and processes. Our understanding of these factors and their many complex interactions is slowly progressing through research. Besides natural events, forest management practices can have both positive and negative affects on these ecological processes.

Forest ecosystem productivity can be measured in many ways for many characteristics. Besides being the key economic resource for the Nimpkish DFA, tree productivity was selected as a coarse-filter measure for this indicator because tree growth reflects change in many processes. Accordingly, site index is a common measure of productivity for an individual tree species on a given site. It is actually a measure of the tree's height growth expected in 50 years. Site index is appropriate for this indicator because although it varies with tree species, it remains constant as trees age.

This indicator suggests a long-term commitment. Monitoring site index on the same sites throughout multiple rotations should provide valuable information regarding how forest management practices have influenced site productivity for timber production. In time, as we gain better understanding of the interactions discussed above, we may be able to extrapolate the findings to other ecological conditions and processes. Moreover, because this indicator is somewhat predictable, our attention will naturally be directed towards any anomalies identified and we can focus our resources accordingly. Canfor recognizes, meanwhile, that changes like global weather patterns may affect this indicator over the long term.

DETAILS – This indicator is assessed based on a summary of data collected from Change Monitoring Inventory (CMI) plots established randomly throughout TFL 37. These were done in concert with the Vegetation Resources Inventory (VRI) for TFL 37 during the 2000 and 2001 field seasons.

While The CMI plot details are stored in a database for analysis, the plot locations are managed spatially in Canfor's GIS and can be easily identified as cutblocks are planned and harvested.

CURRENT STATUS – Table 25 shows the average site indices of selected trees measured in the CMI plots.

Table 25 Indicator results for forest ecosystem productivity

	Average Site Index [1] and (number of samples) by Tree Species for CMI Plots								
Year [2]	**Ba**	**Cw**	**Dr**	**Fdc**	**Hm**	**Hw**	**Pw**	**Ss**	**Yc**
2001	15.1 (28)	22.1 (9)	27.1 (5)	31.5 (39)	8.2 (23)	23.2 (80)	24.0 (1)	37.0 (2)	9.8 (17)

1 Site index is measured as the tree height in metres expected in 50 years above dbh.
2 Year that samples were measured and re-measured.

Since the CMI plots were established, 7 plots appear disturbed by harvesting the following cutblocks: CT039, HT054, M061A, NI023L, TK034, TS025 and VR057. Meanwhile, disturbance of another 6 plots is currently planned on the following cutblocks: CE010, CE046, LG100H, MQ021H, MU080 and NW093.

STRATEGY AND IMPLEMENTATION SCHEDULE – A total of 79 CMI plots were established during the 2000 and 2001 field seasons, which resulted in 204 observations of site index. These plots will be re-measured by 2011. More frequent re-measurements may be conducted if funds are available or alternatively, additional plots may be established to capture more observations for certain species or ages. In addition, similar projects conducted will be examined as to whether they are appropriate for this indicator. For example, 105 samples from 87 plots were established for a site index adjustment project in 1997. Although this project was done within second growth stands and focused primarily on Fdc and Hw, with additional observations for Ba and Cw, Canfor expects that at least some of these samples could be transformed into CMI plots.

Methods for estimating site index depend, in part, on the age of the tree, because until a tree reaches 50 years of age above breast height, site index must be predicted. Based on a tree's age above breast height (1.3 metres), the typical methods used for predicting site index are as follows:

- *Less than 3 years, use the BEC/Species correlation method.*
- *3 to 30 years, use the growth intercept method.*
- *More than 30 years, use the SI curve method.*
- *Exactly 50 years, measure the tree height directly.*
- *Harvested trees, conduct a stem or stump analysis*

MONITORING – CMI plots are scheduled for re-measurement approximately every 10 years. Once these plots are harvested, they are re-established and new sample trees are identified. CMI plots that are both harvested and planned for harvest are summarized in the SFM annual report.

FORECASTING – Forecasting is not required for this indicator as site index is expected to remain relatively constant throughout a tree's lifespan.

Objective 2.3 (b) Minimize the impact on forest resources resulting from uncontrolled fire, insect outbreak, windthrow or flooding losses.

This objective is realized through an indicator that addresses timber salvage.

Timber Salvage

Indicator	*Target*	*Acceptable Variance*
23. Percent consistency with annual targets set in the Damaged Timber Plan.	All cutblocks felled over any 5-year period are consistent with annual targets set in the Damaged Timber Plan.	-5% of the target.

JUSTIFICATION – Timber is sometimes damaged through natural events like fire, wind, disease, insects, flood and snow. To minimize losses to its commercial value, it is necessary to recover this timber within a reasonable

timeframe. Canfor's timber salvage program contributes to minimize losses by identifying, prioritizing and managing the recovery of damaged timber. A key component of this program is the production of an annual Damaged Timber Plan, which records the area and volumes of timber that is damaged, and prioritizes salvage activities.

DETAILS – This indicator is assessed at two planning stages:

- *Cutblocks identified in the damaged timber plan are checked for consistency with planned layout activities.*
- *The annual targets in the damaged timber plan are checked for consistency with the actual felling start dates.*

Ultimately results are compiled as follows:

Calculation	**% HA $_{CONSISTENT}$ = HA $_{CONSISTENT}$ / HA $_{TOTAL}$**	
Variables	% HA $_{CONSISTENT}$	Percentage of the total harvest area consistent with targets set in the Damaged Timber Plan over a 5-year period.
	HA $_{CONSISTENT}$	Harvest area of cutblocks that are consistent[1] with targets set in the Damaged Timber Plan over a 5-year period.
	HA $_{TOTAL}$	Total harvest area of cutblocks where felling started[2] over a 5-year period.
Notes	*1. If timber salvage is not required then the cutblock is considered consistent.* *2. Use cutblock felling started dates reported to MoF.*	

CURRENT STATUS – Although Canfor identified, prioritized and managed the recovery of damaged timber in the past, a formal Damaged Timber Plan was not prepared. So in retrospect, Table 26 only lists the cutblocks where timber salvage was planned. This is summarized for cutblocks where felling began over the last 5 years. Over this time period, all harvest targets for damaged timber were achieved.

Table 26 Indicator results for timber salvage.

Year	Cutblocks Planned for Timber Salvage[1]	Harvest Area Consistent[2] (ha)	Total Harvest Area (ha)	% Consistent
2000	CT042WF, NW055WF, NW090WF, SW052BWF	1,341.1	1,341.1	
2001	AL021WF	1,195.3	1,195.3	
2002	BC018WF, HR066WF, MCI013WF, MU198WF, NE039AWF, NE039DWF, NE060WF, NR003WF, NW055WF2, NW074WF, NW074WF2, SW052CWF, SW052HWF, SW053WF, SW054AWF, VR061WF, W026WF	1,896.0	1,896.0	100.0%
2003	AL022WF, AL037WF, DL024WF, GC017WF, HR153WF, KU013WF, KX071WF, MQ004WF, SC005WF, SW058WF, WS111WF	1,216.2	1,216.2	
2004	N/A	1,377.7	1377.7	

1 List of cutblocks where felling began that were planned for timber salvage.
2 Harvest area of cutblocks consistent with annual targets set in the Damaged Timber Plan.

STRATEGY AND IMPLEMENTATION SCHEDULE – Ideally, damaged mature timber is given highest priority for harvesting. However, plans to salvage this timber must consider economic viability and ecological appropriateness. Salvage of damaged timber in an OGMA, WHA and UWR will be consistent with set objectives. Canfor will prepare its first Damaged Timber Plan prior to the 2005 harvest year. Through aerial and ground reconnaissance, all damaged timber will be identified, tracked and considered for harvest in this plan and targets for salvaging this timber will be specified.

Windthrow is the most significant damaging agent on the Nimpkish DFA. In recent years, new information has emerged on the causes of windthrow and techniques to determine where potential windthrow risks exist. These

techniques are incorporated into the basic design of cutblocks to reduce the incidence of windthrow. Experiments with other control methods on high-risk edges such as feathering and pruning (hand and helicopter) have been completed and planned. Canfor is currently experimenting with control methods such as helicopter pruning and feathered edges on cutblocks.

Indicator 20 (percent consistency with time to control a forest fire) for Objective 2.2 (b) specifically addresses Canfor's strategy and performance for minimizing the impact of fire-related damage.

Canfor's proactive pest control strategy is designed to minimize risk. Insect outbreaks usually target one tree species and populations are ultimately controlled by biological factors. To control potential damage and minimize losses, Canfor manages for a mix of ecologically suitable tree species both at the stand and landscape level and populations are monitored as incidents occur. In the event of a potentially catastrophic insect outbreak, Canfor's co-operates with government agencies and neighbouring licensees in designing and implementing a co-ordinated control program. Aerial application of pesticides may be required to control a catastrophic outbreak.

All areas proposed for harvest are assessed for existing or potential disease during field reconnaissance and cutblock layout. If the presence of root rot(s) is detected, a detailed root rot survey is completed and results are integrated in SPs. Ameliorative treatments recommended may include stump pulling, push falling, or planting resistant tree species.

Timber losses due to flooding and snow damage events are not of major concern in the Nimpkish DFA. Most often, these types of damaging agents result in timber that is uneconomic or ecologically inappropriate to salvage.

MONITORING – The status of timber damaged due to natural events is determined from routine cutblock inspections and occasional aerial surveys and reported in the Damaged Timber Plan. The volumes of salvaged timber are estimated as cutblocks are planned and harvested and results relative to the annual harvest targets are summarized in the SFM annual report.

FORECASTING - Assumptions for unharvested damaged timber are considered in the information package and timber supply analysis for SFM plan 9 (Appendix III and IV). Adjustments to the potential harvest for incidental losses are applied as yield reductions through operational adjustment factors, whereas unsalvaged epidemic losses are applied as a direct removal from the modeled harvest level (see Appendix III).

Criterion 3. Conserve Soil and Water Resources

This criterion seeks to conserve soil and water resources by maintaining their quantity and quality in forest ecosystems. Specific elements include soil and water quality and quantity. Specific values identified are: a) soil quality and quantity, b) naturally clean and clear water, and c) natural water quantities.

Value 3.1 Soil Quality and Quantity

Conserving soil and water resources is promoted by maintaining soil quality and quantity. Three indicators are used to assess the following objective developed for this value: manage soil resources to sustain productive forests.

Objective 3.1 (a) Manage soil resources to sustain productive forests

This objective is realized through indicators that address road development, landslides and soil disturbance.

Road Development

As they are developed, road areas are converted to non-productive forest land. To minimize this, appropriate road development strategies are implemented to sustain productive forests. Road development is addressed through indicator 21 (percent of the harvested area that is converted to unproductive sites for road development) and its associated target on page 53.

Landslides

Indicator	Target	Acceptable Variance
24. Area converted to non-productive forest land resulting from landslides that are induced by forest development activities.	No area is converted to permanent non-productive area, resulting from landslides observed over any 5-year period that are induced by forest development activities.	+10 hectares to the target.

JUSTIFICATION – Landslides and other surfacial geological soil disturbances occur naturally on the Nimpkish DFA. Tree roots are a crucial factor in the stability of steep forested slopes. The risk of landslides increases within 2 years of harvesting, with a maximum loss in root strength in the 4-7 year range before the root strength in the soil starts to recover with regeneration. Accelerated rate of landslides caused by forest development activities can have long-term negative effects of the productive forest landbase. Significant soil erosion from these slide events can also have negative impacts on water quality.

DETAILS – This indicator is assessed through a review of the Landslide Reports completed for all observed landslides. The Landslide Description section in the report describes the size, dimensions, and amount of productive and/or non-productive area remaining. These reports also specify where and how the slide may have originated. Landslides are considered induced by forest development activities if they originated within a harvested cutblock or close proximity to a constructed road.

CURRENT STATUS - Critical hazards include areas with an extreme risk of erosion near public highways, fish streams, human habitation or power lines. Low erosion hazard ratings are not likely to be dealt with because most of these sites have been naturally re-vegetated. All significant erosion hazards on pre-1995 roads have been treated. Table 27 shows that over the past four years, an average of 1.5 hectares of non-productive area resulted from slides caused by forest development. Although this does not meet the target of 0 hectares, each year is well within the acceptable variance for this indicator.

Table 27 Indicator results for landslides.

Year	Cutblocks with Landslides Induced by Forest Development	Non-Productive Area Resulting From Landslides	Total Non-Productive Area for the 5-Year Period
2000	CE012, DL025, CE018, NW040, NW029	0.9 ha	6.2 ha
2001	NW008, NW056D, NW058, NW071	0.6 ha	
2002	NW006, NW054, NW571	1.2 ha	
2003	BC016, KC170, MK026, NW056D, NW591, TS031	0.9 ha	
2004	CA004, CA025, KA030, KA171A, LG214, ME029, NE038, TS031, WG017	2.6 ha	

STRATEGY AND IMPLEMENTATION SCHEDULE - The planning staff engage a geotech engineer for assessments of sites where road locations and cutblocks are located within areas identified as moderate to high likelihood of landslide or other indictors of unstable terrain are found. Recommendations from the geotech reports are incorporated in road and harvesting plans. Stream cleaning prescriptions are also incorporated into harvest plans where debris transport capabilities are apparent. Hazard ratings are assessed for road construction and harvesting activities to establish the frequency for supervisors to conduct documented monitoring of the site. The above actions limit the potential for harvesting induced landslides.

MONITORING - Annual overview flights identify new slides or other disturbance events and additional helicopter reconnaissance is conducted following significant rain on snow events. For each slide event, Canfor staff completes a Landslide Report and may initiate an assessment of root cause and any necessary remedial actions. Canfor's ITS is used to track these slide events and its operations database is used to ensure rehabilitation work is completed. This data is summarized annually in the SFM annual report.

FORECASTING - Forecasting results for this indicator is not applicable because operational controls in place to minimize these events are overshadowed by the typical root causes: meteorological and geological processes. At this time, Canfor is unable to consider these processes with any forecasting assumptions or tools available.

Soil Disturbance

Indicator	*Target*	*Acceptable Variance*
25. Percent consistency with management practices to address soil disturbance.	All cutblocks felled over any 5-year period are consistent with management practices to address soil disturbance.	-5% of the target.

JUSTIFICATION – Conservation of soils sustain the long-term productivity of the ecosystem.

DETAILS – This indicator is assessed based on a query of Canfor's silviculture database, as follows:

Calculation	**% HA $_{CONSISTENT}$ = HA $_{CONSISTENT}$ / HA $_{TOTAL}$**	
Variables	% HA $_{CONSISTENT}$	Percentage of the total harvest area consistent with soil disturbance management over a 5-year period.
	HA $_{CONSISTENT}$	Harvest area of cutblocks that are consistent[1] with management practices to address soil disturbance over a 5-year period.
	HA $_{TOTAL}$	Total harvest area of cutblocks where felling started[2] over a 5-year period.
Notes	*1. If no formal soil disturbance management practices are required then the cutblock is considered consistent.*	
	2. Use cutblock felling started dates reported to MoF.	

CURRENT STATUS - Soil disturbance commitments identified in SPs reflect the legal limits stated in the Timber Harvesting and Silviculture Regulation. Table 28 shows that up to 2003, the harvest methods deployed resulted in negligible soil disturbance and therefore surveys were not conducted. In 2004, a skidder trial was conducted for the second growth program to potentially reduce harvesting costs. The trial measured both costs and soil disturbance. The results of the skidder trial were promising and based on those results the skidder was incorporated in the 2004 fall second growth program. With the reintroduction of the skidder on an operational basis, soil disturbance levels will be an issue and surveys will need to be conducted to ascertain results.

Table 28 Indicator results for soil disturbance.

Year	Cutblocks Requiring Soil Disturbance Management[1]	Harvest Area Consistent[2] (ha)	Total Harvest Area (ha)	% Consistent
2000	N/A	1,341.1	1,341.1	
2001	N/A	1,195.3	1,195.3	
2002	N/A	1,896.0	1,896.0	100.0%
2003	BC220	1,216.2	1,216.2	
2004	N/A	1,377.7	1,377.7	

1 List of cutblocks requiring a formal survey to determine soil disturbance levels.
2 Harvest area of cutblocks consistent with management practices to address soil disturbance.

STRATEGY AND IMPLEMENTATION SCHEDULE - Ecologically and economically appropriate harvest systems are prescribed at the site level to ensure soil disturbance objectives are met. Timing forest operations seasonally also helps minimize site disturbance. If site disturbance objectives of the SP are exceeded, corrective actions are taken as required. Rehabilitation will be prescribed and reviewing the appropriateness of the skidder on similar sites will be assessed.

MONITORING - The harvest phase final Inspection form will initiate an action plan for a soil disturbance survey to be conducted. An ocular estimate will determine whether the harvesting results warrant a formal survey to confirm

the level of soil disturbance. Action plans are tracked in ITS. These results are summarized annually in the SFM annual report.

FORECASTING - As site disturbance limits are based on the Timber Harvesting and Silviculture Regulation, forecasting is not applicable.

Value 3.2 Naturally Clean and Clear Water

Conserving soil and water resources is promoted by maintaining natural water quality. One indicator is used to assess the following objective developed for this value: minimize effects Canfor's activities have on water quality.

Objective 3.2 (a) Minimize the effects that Canfor's activities have on water quality

This objective is realized through an indicator that addresses water quality impacts.

Water Quality Impacts

Indicator	*Target*	*Acceptable Variance*
26. Number of medium to high significant non-compliances/ non-conformances with water quality impacts.	No high significant non-compliances/ non-conformances with water quality impacts.	To be determined following several years of results.

JUSTIFICATION – Significant impacts to water quality involve incidents that have, or could have, significantly altered the sedimentation, temperature or chemical properties of a stream. Minimizing the effects of Canfor's activities on water quality is essential to maintain a healthy ecosystem. The potential to impact water quality is present in all aspects of forest management activities. The inclusion of non-conformances with this indicator captures incidents where a breach of Canfor's internal standards have occurred, and could have the potential to significantly impact water quality.

DETAILS – Canfor's FMS defines both medium and high significant incidents (see Abbreviations and Definitions section 10.0). For this indicator, medium significant issues are tracked to identify performance trends, while the target is assigned only for high significance incidents.

CURRENT STATUS - Both Canfor and government agencies routinely monitor and inspect regulatory requirements around riparian management at various stages in the cutblock planning process. Practices are also verified for compliance and conformance through internal and external audits. Incidents that do not comply are reported and tracked through Canfor's ITS database. Table 29 shows the recorded water quality incidents for 2003 and 2004. During this time, there were no non-compliances or non-conformance incidents of high significance.

Table 29 Indicator results for water quality impacts.

Year	# of Non-Compliances or Non-Conformances [1]	
	Medium Significance	High Significance
2003	1	0
2004	2	0

1 Medium/high significance is defined in the Abbreviations and Definitions section 10.0

STRATEGY AND IMPLEMENTATION SCHEDULE - Canfor recognizes that the maintenance of water quality is imperative to sustaining the aquatic ecosystem and for recreation and consumptive uses. Water quality is managed by applying the riparian management zones, watershed assessments, proactive road maintenance and the deactivation program, and monitoring rainfall during harvesting and development activities. Roads and bridges are engineered and constructed to maintain water quality. Temporary roads are deactivated to reduce the risk of failure

and siltation of water bodies. Silt fences are used during construction near fish bearing streams to reduce siltation. Pesticide and fertilizer free zones (and buffers) are established during silviculture treatments to prevent introduction into fish streams. Aerial and ground reconnaissance is conducted after significant storm events and observations may identify non-conformances and non-compliances that would then be documented in ITS.

Internal Monitoring and Inspection forms are the basis for identifying non-conformances/non-compliances. Other sources of findings that will be included are from annual internal audits, KPMG external audits, MoF inspections, etc. Incidents are tracked in ITS and will be summarized on an annual basis. A 3-year rolling average will be reported in the SFM annual report. 2003 ITS entries will be the beginning period for the 3-year rolling average.

MONITORING - Incidents identified during internal monitoring and inspections will be tracked in ITS. Significant issues are investigated and may result in reviewing other cutblocks for establishing the extent of the issue. These results are summarized annually in the SFM annual report.

FORECASTING - Forecasting is not applicable for this indicator as occurrences of significant non-compliance and non-conformance incidents are unpredictable.

Value 3.3 Natural Water Quantities

Conserving soil and water resources is promoted by maintaining natural water quantities. One indicator is used to assess the following objective developed for this value: manage the impacts on natural seasonal flows.

Objective 3.3 (a) Manage the impacts on natural seasonal flows

This objective is realized through an indicator that addresses hydrologic condition.

Hydrologic Condition

Indicator	*Target*	*Acceptable Variance*
27. Percent of watershed areas assessed with a high hydrologic condition index.	Report watershed areas according to their hydrologic condition index.	To be derived as appropriate targets are developed.

JUSTIFICATION – This indicator is based on climate, watershed character and management activities and compared to other approaches, it is most appropriate in the wetter regions of Vancouver Island watersheds. Hydrologic condition is a function of watershed sensitivity and hydrologic hazard. Watershed sensitivity is generally assessed based on climate, landslide potential, stream sensitivity and downstream values, such as fish or water intakes. A watershed's hydrologic hazard, meanwhile, is based the condition of roads and streams, and the terrain that is vulnerable to landslide. Once each watershed in the Nimpkish DFA is assessed with a hydrologic condition index (HCI), targets and strategies directed towards reducing the hydrologic hazard will be developed.

DETAILS – This indicator is assessed based on a summary of data collected from a hydrologic condition project that will be completed in 2006 (see Strategy and Implementation Schedule below). Periodic assessments following the baseline results will apply the same methodology in updating HCIs for each watershed. Ideally, these updates will be based on a spatial analysis of road and block activities as well as new data relating to streams and landslides.

CURRENT STATUS - Table 30 illustrates how the hydrologic condition indicator will be summarized once the initial project is completed in 2006(see Strategy and Implementation Schedule below).

Table 30 Indicator results for hydrologic condition [1].

Year	Watershed Area (ha) with a HCI of High	Total Watershed Area (ha)	Percent High HCI
2006	n/a	n/a	n/a%

1. This table will be completed as a component of the hydrologic condition project in 2006.

STRATEGY AND IMPLEMENTATION SCHEDULE – For several years, Canfor has periodically conducted channel and watershed assessments requested by the MoF's district manager. Although this captured watersheds with specific concerns, this approach lacked a systematic and integrated means to assess and forecast potential water quantity and quality issues. For this reason, Canfor has elected to implement a new approach for assessing hydrologic risk and measuring strategies employed to reduce specific hazards. This hydrologic condition project will be completed in 2006.

Although specific procedures may change slightly as the project progresses, HCIs assessed for each watershed will assist Canfor's planners in prioritizing activities throughout the Nimpkish DFA. Internal systems currently in place may be augmented in the following areas as our understanding of hydrologic condition strengthens:

- *Monitoring landslide attributes.*
- *Monitoring stream and fish attributes.*
- *Planning roads and cutblocks.*
- *Constructing and deactivating roads.*

MONITORING – Hydrologic condition is determined through analysis and updates of the hydrologic condition project. Progress is discussed in the SFM annual report while landscape-level results are summarized every 5 years.

FORECASTING – Forecasting is not applicable for this indicator as it is intended to provide a process for continually assessing risk and prioritizing management activities. Ultimately, the pattern of these decisions is unpredictable.

Criterion 4. Forest Ecosystem Contributions to Global Ecological Cycles

This criterion seeks to maintain forest conditions and management activities that contribute to the health of global ecological cycles. Specific elements include carbon uptake and storage and forest land conversion. Specific values identified are: a) natural carbon cycle and b) protection of the forest landbase.

Value 4.1 Natural Carbon Cycle

As a result of the 1997 Kyoto Protocol, international attention has been focused on the problem of climate change, resulting from global greenhouse gas emissions. This has placed considerable pressure on the public and private sectors to account for the impact of forest management and other land-uses on GHG emissions. It has also created interest within the forest sector in opportunities to mitigate GHG emissions.

Forest ecosystems play an important role in the global carbon cycle and therefore maintaining the functions of these ecosystems is key to ensuring that efforts to reduce global GHG emissions have the desired effect. Forest ecosystems have the ability to both sequester carbon dioxide from the atmosphere (through photosynthesis) and to store it as carbon in wood and other biomass. The goal of maintaining ecosystem function in the carbon cycle can be achieved through the maintenance of these two processes. Two indicators are used to assess the following objective developed for this value: the amount of carbon stored and the rate for carbon uptake.

Objective 4.1 (a) Maintain the processes for carbon uptake and storage.

This objective is managed through indicators that address carbon storage and carbon sequestration rate.

Carbon Storage

Indicator	*Target*	*Acceptable Variance*
28. Amount of carbon stored in the forested ecosystem by carbon pool (mega tonnes of carbon).	Report the carbon stored in the forested ecosystem by pool every 10 years.	To be derived as appropriate targets are developed.

JUSTIFICATION – Forestry activities have the potential to contribute as a net sink of carbon through a surplus of afforestation and reforestation over forest loss. The capacity of forest ecosystems to sequester carbon is an environmental aspect of SFM.

Carbon storage is contained in several components of the forest, including tree biomass, plant biomass, coarse woody debris (CWD), forest floor litter, and soil. Forest soils are a large but relatively stable reservoir of carbon with minimal changes over time. In contrast, variation in carbon storage in tree biomass is the dominant factor regulating temporal patterns in total ecosystem carbon storage.

Total volume of standing timber in both the HLB and NHLB is used as a surrogate for carbon storage within the Nimpkish DFA. This indicator is influenced by harvest levels over time and natural disturbances.

DETAILS – This analysis will use a stand-level model to predict total ecosystem carbon in major or carbon pools. The dataset used in the timber supply analysis will then be modified to consider scenarios at a forest level. This project will be completed in 2006. A base case scenario equivalent to the one developed for the timber supply analysis will be developed and scenarios may be developed to provide an indication of the role of harvesting and catastrophic disturbances in carbon storage.

CURRENT STATUS – Table 31 illustrates how the carbon storage indicator will be summarized once the initial project is completed in 2006 (see Strategy and Implementation Schedule below).

Table 31 Indicator results for carbon storage [1]

Carbon Pool	**Carbon Storage**		
	NHLB (MT)	**HLB** (MT)	**Total** (MT/yr)
Trees			
Plants			
CWD/Snags			
Litter			
Soil			
Total			

1. This table will be completed as a component of the carbon project in 2006.

STRATEGY AND IMPLEMENTATION SCHEDULE - Canfor manages carbon storage through prompt reforestation and maintaining acceptable levels of stocking over the landscape on previously harvested and regenerated sites. This also includes avoiding emissions (e.g., avoid/reduce impacts of fire, insects, disease, harvesting). Although factors that affect carbon storage are effectively inseparable from those affecting the rate of carbon sequestration, some management activities do not directly increase sequestration rates but can reduce or avoid emissions that would occur due to decay or combustion.

Canfor is working on a project to develop a stand-level carbon attribute database, which will link to the timber supply analysis (Appendix IV) completed in 2005. This will develop a base case scenario equivalent to the one developed for the timber supply analysis. Additional scenarios may be developed to indicate the role of harvesting and catastrophic disturbances in carbon storage. The initial carbon project will be completed in 2006.

Models and inventories used to predict carbon storage are rudimentary at this point, so as new knowledge is gained, this indicator will be assessed to determine if the data and methods are appropriate.

MONITORING – The amount of carbon stored in the forested ecosystem is monitored through a systematic application of inventories and assumptions for both the NHLB and THLB. Progress is discussed in the SFM annual report while landscape-level results are summarized every 10 years.

FORECASTING - Carbon storage in both the NHLB and THLB will be considered as parallel processes in subsequent timber supply analyses for SFM planning. Basic carbon attributes will be forecasted over a 250-year planning horizon.

Carbon Sequestration Rate

Indicator	*Target*	*Acceptable Variance*
29. Average carbon sequestration rate in the forested ecosystem by carbon pool (mega tonnes of carbon per year)	Report the average carbon sequestration rate in the forested ecosystem by carbon pool every 10 years.	To be derived as appropriate targets are developed.

JUSTIFICATION – This indicator evaluates the long-term effects that management activities and/or natural disturbance have on the rate at which the forested landscape is sequestering carbon. Sequestration is calculated as the net amount of carbon removed from the atmosphere and stored in the forested ecosystem each year, while average sequestration rates are based on changes in ecosystem carbon storage over time. For this indicator, Carbon stock changes within the forest are separated from those that are removed as harvested biomass outside the forest to facilitate modelling of the emissions. Accordingly, carbon stored as wood products is not within the scope of this indicator.

DETAILS – This analysis will use a stand-level model to predict total ecosystem carbon in major or carbon pools. The dataset used in the timber supply analysis will then be modified to consider scenarios at a forest level. This project will be completed in 2006. A base case scenario equivalent to the one developed for the timber supply analysis will be developed and scenarios may be developed to provide an indication of the role of harvesting and catastrophic disturbances in carbon storage.

CURRENT STATUS – Table 32 illustrates how the carbon sequestration indicator will be summarized once the initial project is completed in 2006 (see Strategy and Implementation Schedule below).

Table 32 Indicator results for carbon sequestration rate [1]

Carbon Pool	**Carbon Sequestration**		
	NHLB (MT/yr)	**HLB** (MT/yr)	**Total** (MT/yr)
Trees			
Plants			
CWD/Snags			
Litter			
Soil			
Total			

1. *This table will be completed as a component of the carbon project in 2006.*

STRATEGY AND IMPLEMENTATION SCHEDULE - Canfor manages the rate carbon is sequestered through prompt reforestation and maintaining acceptable levels of stocking over the landscape on previously harvested and regenerated sites. This also includes avoiding emissions (e.g., avoid/reduce impacts of fire, insects, disease, harvesting). Although factors that affect the rate of carbon sequestration are effectively inseparable from those affecting carbon storage, some management activities do not directly increase sequestration rates but can reduce or avoid emissions that would occur due to decay or combustion.

Canfor is working on a project to develop a stand-level carbon attribute database, which will link to the timber supply analysis (Appendix IV) completed in 2005. This will develop a base case scenario equivalent to the one

developed for the timber supply analysis. Additional scenarios may be developed to indicate the role of harvesting and catastrophic disturbances in carbon storage. The initial carbon project will be completed in 2006.

MONITORING – The amount of carbon stored in the forested ecosystem is monitored through a systematic application of inventories and assumptions for both the NHLB and HLB.

FORECASTING - Carbon sequestration in both the NHLB and HLB will be considered as parallel processes in subsequent timber supply analyses for SFM planning. Average carbon sequestration rate (MT/yr) for 10-year periods over the planning horizon.

Value 4.2 Protection of the Forest Landbase

Maintaining forest ecosystem contributions to global ecological cycles is promoted by protecting forest landbase. Three indicators are used to assess the following three objectives developed for this value: a) maintain the forest landbase, b) Minimize impacts to the THLB of other forest developers where possible and c) Ensure that forests are regenerated on harvested and disturbed sites.

Objective 4.2 (a) Maintain the forest landbase.

This objective is realized through an indicator that addresses road development.

Road Development

As they are developed, road areas are converted to non-productive forest land. To minimize this, appropriate road development strategies are implemented to maintain the forest landbase. Road development is addressed through indicator 21 (percent of the harvested area that is converted to unproductive sites for road development) and its associated target on page 53.

Objective 4.2 (b) Minimize impacts to the timber harvesting landbase of other forest developers where possible.

This objective is realized through an indicator that addresses other forest developers.

Other Forest Developers

Indicator	*Target*	*Acceptable Variance*
30. Documented communications with other forest developers that potentially impact the THLB.	Stress the minimization of losses in all referrals that have the potential to remove land from the THLB.	Not acceptable.

JUSTIFICATION - Minimizing further alienation of the THLB is crucial to sustain harvest levels. Canfor's planners must ensure approving agencies are cognizant of the impacts that additional reductions have on the THLB and ultimately, timber supply. Accordingly, on all responses to referrals that have the potential to remove land ,Canfor must emphasize its commitment to minimize impacts to the THLB.

DETAILS – This indicator is assessed based on a review of the documented communications with other forest developers. The Manager, Forestry & Environment, contact person for all referrals, maintains a record of these on file.

CURRENT STATUS – In its responses non-forest developers on the Nimpkish DFA, Canfor ensures that are they are aware of the potential for the cumulative effects on habitat and timber supply from the loss of productive forest land.

Table 33 describes Canfor's responses to referrals received more recently. Currently, the largest non-forest developer is BC Transmission Corporation (BCTC), which operates and maintains transmission lines throughout the

Nimpkish DFA. Recently, Canfor has raised concerns regarding additional transmission lines associated with independent power projects planned in the area. Depending on the length and location of these lines, they could represent a significant loss of productive forest.

Table 33 Indicator results for other forest developers.

Year	Descriptions	# Referrals Received	# THLB-Related Responses [1]
2003	Proposals for independent power projects	3	3
2004		0	0

1 Responses that specifically stress minimization of removing land from the THLB

STRATEGY AND IMPLEMENTATION SCHEDULE - All referrals are forwarded and reviewed by the Manager, Forestry and Environment, who will respond where appropriate, by stressing Canfor's objective of minimizing the losses to the forest landbase.

MONITORING – Canfor maintains a central file with all referrals and responses. These are summarized in the SFM annual report.

FORECASTING – Forecasting results for this indicator is not applicable because the intent is simply to provide a consistent and appropriate response to referrals, rather than estimate the number received.

Objective 4.2 (c) Ensure that forests are regenerated on harvested and disturbed sites.

This objective is realized through an indicator that addresses forest regeneration.

Forest Regeneration

Indicator	*Target*	*Acceptable Variance*
31. Percent of disturbed areas with reforestation obligations that are satisfactorily regenerated.	Over a 5-year period, all disturbed areas with reforestation obligations are satisfactorily regenerated.	-5% of the target.

JUSTIFICATION – Prompt reforestation of disturbed sites is key to managing towards long-term sustainability. Disturbance refers to a discrete event, either natural or human-induced, that causes a change in the existing condition of an ecological system. For this indicator, disturbance events include harvesting, landslides and fire damage, where forest stands are left with tree stocking that is below the ecologically suitable, minimum acceptable density.

DETAILS – Percent regeneration of disturbed areas is determined through an annual query of Canfor's silviculture database, as follows:

Calculation	**% HA $_{REGENERATED}$ = HA $_{REGENERATED}$ / HA $_{DISTURBED}$**	
Variables	% HA $_{REGENERATED}$	Percent regenerated over a 5-year period.
	HA $_{REGENERATED}$	Total area[1] satisfactorily regenerated over a 5-year period.
	HA $_{DISTURBED}$	Total area[1] disturbed[2] over a 5-year period.
Notes	*1. Limited to areas where Canfor is obligated to reforest under its licence.* *2. Disturbed areas may include harvesting, landslides and fire damage.*	

CURRENT STATUS – Table 34 shows that over the last 5 years, 98.8% of disturbed areas with reforestation obligations are satisfactorily regenerated. This is summarized for cutblocks harvested.

Table 34 Indicator results for forest regeneration.

Year	Area Disturbed	Area Reforested	Annual Ratio	5 Year Average
2000	1,410.9	1,247.2	88.3%	
2001	1,203.6	1,179.2	98.0%	
2002	1,409.6	1,152.3	81.7%	98.8%
2003	1,206.5	1,250.0	103.6%	
2004	997.1	1,321.7	132.5%	

STRATEGY AND IMPLEMENTATION SCHEDULE – Canfor's planting program is focused on reforesting disturbed sites with reforestation obligations as soon as practicable, preferably within 2 years from the date when felling of the cutblock began. Subsequent regeneration surveys are conducted to ensure that sites are fully occupied with acceptable tree species.

MONITORING – Planting and harvesting records are tracked in Canfor's silviculture database. These are summarized in the SFM annual report.

FORECASTING – Forecasting results for this indicator is not applicable, as natural disturbance events, market conditions, and the time of sowing to planting delays are unpredictable.

Criterion 5. Multiple Benefits to Society

This criterion seeks to sustain flows of forest benefits for current and future generations by providing multiple goods and services. Specific elements include timber and non-timber benefits, communities and sustainability and fair distribution of benefits and costs. Specific values identified are: a) sustainable supply of timber, b) multiple benefits from the Nimpkish DFA forests, c) stability in North Island communities supported by the Nimpkish DFA, and d) fair distribution of timber and non-timber benefits and costs over time.

Value 5.1 Sustainable Supply of Timber

Providing multiple benefits to society is promoted by sustaining timber supply. Three indicators are used to assess the following two objectives developed for this value: a) maintain sustainable harvest levels and b) maintain native tree species diversity at the landscape level.

Objective 5.1 (a) Maintain a diverse and sustainable supply of timber

The most significant economic benefits to the region are derived through the timber resource. In fact, Canfor's success and the number of persons directly and indirectly employed from the Nimpkish DFA operations is partly related to annual harvest. Accordingly, Canfor seeks to maintain sustainable harvest levels. This objective is realized through indicators that address harvesting the AAC and harvesting certain profiles.

Harvesting the AAC

Indicator	*Target*	*Acceptable Variance*
32. Total volume harvested relative to the AAC authorized over the cut control period.	The volume harvested does not exceed the total AAC authorized for the cut control period.	+10% to the target.

JUSTIFICATION – A sustainable supply of timber must balance the overall rate at which the forest is harvested with the rate at which it can regenerate. Every five years the provincial Chief Forester considers an array of timber and non-timber objectives desirable on the same landbase in his determination of the AAC for TFL 37. Ensuring that the rate of harvest over the five-year period does not exceed the AAC limits indicates that the harvest levels are appropriately within the long-term productive capacity of the landbase.

DETAILS – Total volume harvested relative to the AAC is determined through an annual summary of Canfor's scaling records, as follows:

Calculation		**% PERFORM $_{HARVEST}$ = VOL $_{HARVEST}$ / VOL $_{AAC}$**
Variables	% PERFORM $_{HARVEST}$	Percentage of total volume of timber harvested relative to the AAC authorized over the cut control period.
	VOL $_{HARVEST}$	Total volume of timber harvested[1] over the cut control period.
	VOL $_{AAC}$	Total AAC authorized over the cut control period.
Notes	*1. Volume harvested includes volume scaled, residue and waste, other volume adjustments authorized by the MoF and over-cut/under-cut carry forwards).*	

CURRENT STATUS - The actual cut for any single year has ranged from 78% of the AAC in 1970 to 132% of the AAC in 1976 (see Figure 3 in section 1.1.1). The mean percent of the AAC harvested annually from 1961 to 2004 is 101.7%. This supports the management objective of a steady harvest within allowable limits.

Table 35 shows the harvest performance for both Canfor and BCTS relative to the AAC for the current cut control period. With one year of the cut control period remaining, both licensees are performing at only 3.7% below the target for this indicator.

Table 35 Indicator results for harvesting the AAC.

Year[1]	Canfor Volume Harvested	Canfor AAC (m3/yr)	BCTS Volume Harvested	BCTS AAC (m3/yr)	Current % Performance
2001	885,525	1,024,816	34,176	43,184	
2002	1,156,720	1,024,816	45,511	43,184	
2003	817,758	1,024,816	25,705	43,184	96.7%
2004	1,113,615	1,024,816	51,003	43,184	
2005	n/a	n/a	n/a	n/a	

1. Current cut control period shown is 2001 to 2005.

STRATEGY AND IMPLEMENTATION SCHEDULE - Canfor harvests timber according to the TFL agreement and the AAC determined by the provincial Chief Forester. The actual annual harvest is also influenced by, among other factors, legislated penalties that regulate annual and 5-year periodic harvest levels – the cut control period. The harvest must be within 50% of the allowable annual volume each year and also within 10% of the allowable volume every five years. This can provide some flexibility for addressing market and operational conditions.

MONITORING – Both Canfor and the MoF track timber volumes as it is scaled. These scaled volumes are used to generate stumpage billings and to monitor Canfor 's consistency with its allocated cut. Results are summarized for the calendar year and averaged over the 5-year cut control period, in the SFM annual report.

FORECASTING - In accordance with the TFL agreement, Canfor prepares a timber supply analysis every five years that presents a series of short- and long-term timber supply forecasts (see Appendix IV). This typically involves a detailed review of the existing inventories, operability, growth and yield and forest cover constraints. Sensitivity analyses are done to further explore uncertainties regarding the applied assumptions and to understand their potential impacts. Specific scenarios are also developed to compare significant differences with management strategies.

The analysis is submitted to the provincial Chief Forester who determines an appropriate AAC for the TFL 37 by considering the uncertainty associated with the information presented. He also assesses the various potential current and future social, economic and environmental risks associated with a range of possible AACs. A legislated requirement for frequent analyses also addresses uncertainty by ensuring current information and knowledge is incorporated.

Harvest Profile

Indicator	*Target*	*Acceptable Variance*
33. Harvest profile by area for: economic operability, logging type, tree species, and stand type.	The area harvested does not exceed the key profile targets listed in Table 36 for the cut control period.	As shown for each key profile in Table 36.

JUSTIFICATION - Specific harvest profile targets established for the term of SFM plan 9 are given in Table 36. Additionally, Canfor organizes its harvest priorities and patterns accordingly:

- *Implement ecosystem-based forestry practices,*
- *Salvage damaged or diseased timber,*
- *Harvest over-mature stands first,*
- *Increase the proportion of second growth harvested over the next 25 years, and*
- *Disperse harvest areas to address spatial constraints and patch-size objectives.*

DETAILS – This indicator is assessed based on a spatial exercise, where harvested areas are summarized according to the profiles and assumptions used in the timber supply analysis. Accordingly, the following details apply:

- *Harvested areas are spatially intersected against the profiles listed in Table 36.*
- *Areas are summarized for each cutblock.*

Harvest profiles for stand type, logging type and economic operability are calculated as follows:

Calculation	**$\%\ HA_{PROFILE} = HA_{PROFILE} / HA_{HARVESTED}$**	
Variables	$\%\ HA_{PROFILE}$	Percentage of the harvested area[1] of cutblocks corresponding to each harvest profile over a 5-year period.
	$HA_{PROFILE}$	Total harvested area of each profile over a 5-year period.
	$HA_{HARVESTED}$	Total harvested area[1] over a 5-year period.
Notes	*1*	*Harvested area is spatially tracked through cutblock depletion records, where areas are considered to be loaded out.*

The harvest profile for tree species is calculated as follows:

Calculation	**$\%\ M3_{PROFILE} = M3_{PROFILE} / M3_{HARVESTED}$**	
Variables	$\%\ M3_{PROFILE}$	Percentage of the harvested volume[1] of cutblocks corresponding to each harvest profile over a 5-year period.
	$M3_{PROFILE}$	Total harvested volume of each profile over a 5-year period.
	$M3_{HARVESTED}$	Total volume [1] over a 5-year period.
Notes	*1*	*Inventory volume is spatially identified through cutblock depletion records, where areas are considered to be loaded out, and summarized based on current volume information derived from the forest cover and used in the timber supply analysis.*

CURRENT STATUS - Table 36 summarizes actual harvest profiles for a 5-year period. These profiles generally reflect i) stand type (stand age category), ii) logging type (type of harvesting and yarding methods), iii) economic operability (market prices, planning, engineering and logging costs, government stumpage, etc.), and iv) tree species (based on forest cover inventory). Each year, actual harvested areas are evaluated against these targets. Results for the past 5 years are well within acceptable variance for the key targets identified through the latest timber supply analysis.

Table 36 Indicator results for the harvest profile[1].

Profile Type	Profile Class	Area & Volume Harvested	% of Total Harvest Area	Key Targets [1]	Acceptable Annual Ranges
Stand Type	Old Growth	5,349 ha	83%		
	Second Growth	861 ha	13%	24%	Maximum 30%
	Immature	169 ha	3%		
	NP or NF [2]	40 ha	1%		
Logging Type	Ground/Cable	6,016 ha	94%		
	Helicopter	204 ha	3%	7%	Minimum 4%
	HemBal-Helicopter [4]	198 ha	3%	10%	n/a
Economic Operability	Economic	5,417 ha	84%		
	Marginal	793 ha	12%	14%	Minimum 8%
	Uneconomic	168 ha	3%		
	NP or NF [2]	40 ha	1%		
Tree Species	Hw/Hm	2,477,716 m^3	52%		
	Ba	860,409 m^3	18%		
	Cw	557,574 m^3	12%	11%	Maximum 14%
	Fdc	517,863 m^3	11%	10%	Maximum 13%
	Yc	336,851 m^3	7%	9%	Maximum 12%
	Other	41,167 m^3	1%		
AAC	Volume charged (m3)	5,180,765 m^3	807 [3]		

1 Key harvest profile targets are based on those identified through the twenty year plan analysis for the period 2007 to 2016.
2 NP or NF are areas classified as Non-Productive or Non-Forest
3 Average volume (M3) per hectare based on area harvested and volume charged.
4 The provincial Chief Forester's AAC Determination will establish how HemBal-Helicopter profile class is considered. The target and annual acceptable range provided assumes a partitioned cut is in place.

STRATEGY AND IMPLEMENTATION SCHEDULE – Planners prepare their annual harvest and development plans by first considering the current harvest profile status and associated targets.

MONITORING – Actual harvest profiles are summarized in the SFM annual report through a spatial GIS analysis of areas harvested and the various profile indicators.

FORECASTING - Harvest profile targets are developed through the timber supply analysis and twenty year plan processes (see Appendix VI). As new information and changes in management strategies are incorporated into these analyses, harvest profile targets may be adjusted.

Value 5.2 Multiple Benefits from the Forest

In planning forest activities Canfor seeks out and considers input from the various forest user groups (e.g., guiding, trapping, recreational community, harvesters of non-timber forest products). This is done through the NWAC, advertisement and review of the SFM Plan, information sharing sessions for Forest Development Plan's (FDP)/Forest Stewardship Plan's (FSP), tracking public comments, campsite surveys, and soliciting input for the SFM Plan annual reports.

Providing multiple benefits to society is promoted by providing opportunities for both timber and non-timber users. Nine indicators are used to assess the six objectives developed for this value involving: a) recreation, b) karst, c) hunting, d) fishing, e) botanical forest products, and f) scenic areas.

Objective 5.2 (a) Provide opportunities for outdoor recreation.

Tourism and outdoor recreation are among the opportunities that provide economic benefits to the region. A wide variety of outdoor recreation opportunities are available. The main recreational use is for camping, fishing and hunting although more specialized opportunities like hiking, kayaking, rafting, rock climbing, windsurfing, skiing and caving are increasing in popularity. This objective is realized through an indicator that addresses specific outdoor recreation sites.

Recreation Sites

Indicator	*Target*	*Acceptable Variance*
34. Number of maintained recreation sites.	At least eight campsites are maintained between June 15 and September 15 each year.	-1 campsite.

JUSTIFICATION – Providing and maintaining campsites in more remote but locally popular locations helps meet local demand for recreational pursuits in a natural setting. In the event that it must undergo substantial modification or relocation, the target number of campsites may temporarily be reduced to seven.

DETAILS – This indicator is assessed based on a review of the campsite maintenance program managed by the Woss Woods Forman and a query ITS for public comments regarding DFA campsites.

CURRENT STATUS – Canfor supports recreation opportunities by constructing, maintaining and monitoring the use of designated recreation sites, as listed in Table 37. Canfor's sites are provided free of charge to the public, whereas only a few sites are managed by regional and provincial government where user fees may be required.

Table 37 Indicator results for recreational sites.

Recreation Site	Details	Managed by	Features
Nimpkish Lake	4.5 ha	Canfor	Campsite with 20 pads; pebble beach; windsurfing
Kinman Creek	15.0 ha	Canfor	Campsite with 40 pads; pebble beach; windsurfing
Anutz Lake	1.6 ha	Canfor	Campsite with 20 pads; sandy beach; boating; hiking
Atluck Lake	3.4 ha	Canfor	Campsite with 10 pads; pebble beach; boating; hiking
Woss Lake	4.4 ha	Canfor	Campsite with 30 pads; sandy beach; fishing; boating; walking
Lower Klaklakama (North)	0.7 ha	Canfor	Campsite with 6 pads; rocky beach; fishing
Lower Klaklakama (South)	2.5 ha	Canfor	Campsite with 10 pads; rocky beach; fishing
Vernon Lake	5.2 ha	Canfor	Campsite with 40 pads; sandy beach; fishing; boating
Schoen Lake	0.3 ha	BC Parks	Campsite with 20 pads; pebble beach, fishing
Mt. Cain Ski Resort	511 ha	RDMW [1]	Winter skiing and recreation area; summer hiking.
Huson Regional Park	5.0 ha	RDMW [1]	Karst area with access trail for self-guided tour

1 – RDMW: Regional District of Mount Waddington

In addition to these sites, BC Parks manages PAs designated within and adjacent to the Nimpkish DFA, which consist of both parks and ecological reserves. These total approximately 19,000 ha, and provide considerable wilderness recreation opportunities. BC Parks and RDMW sites are located on Crown land within the Nimpkish DFA but are not considered part of the TFL 37 Schedule A or B lands.

STRATEGY AND IMPLEMENTATION SCHEDULE – Canfor maintains eight campsites containing one hundred eighty-three camper units with overflow capacity to two hundred ten units (see Table 37). Each campsite is supplied with tables, garbage cans, fire rings, and toilet facilities. Garbage collection and site maintenance occurs twice per week and is increased to at least three times per week during peak periods or during extremely hot weather. Potential hazards (e.g., danger trees) are removed, and notices of fire hazard are posted as required.

MONITORING - Canfor's campsite maintenance activities are summarized annually in the SFM annual report. New recreational features are identified as opportunities arise.

FORECASTING - The timber supply analysis for the Nimpkish DFA removes approximately thirty eight hectares from the THLB for recreation sites. At this time, Canfor does not foresee a need for additional campsites.

Objective 5.2 (b) Minimize negative impacts on karst

Caves are a unique, non-renewable resource with geological, scenic, educational, cultural, biological, hydrological, paleonological, and recreational values. Cave tours are among the recreation and commercial opportunities that provide economic benefits to the region. Canfor seeks to minimize the negative impacts its activities might have on this resource. This objective is realized through indicators that address site-level karst management plans and monitoring for baseline levels of cave visits.

Karst Management

Indicator	*Target*	*Acceptable Variance*
35. Percent consistency with management practices to address karst features.	All cutblocks felled over any 5-year period are consistent with management practices to address karst features.	-5% of the target.

JUSTIFICATION – Managing karst values within forested landscapes is an important consideration when proposing harvesting and development projects. This indicator monitors Canfor's consistency with both identifying karst features and implementing prescriptions for karst management.

DETAILS – This indicator is assessed at three planning stages:

- *Cutblocks identified within a landscape-level overview of karst vulnerability potential are checked for consistency with planned assessment activities.*
- *The recreation section of each site plan is checked for consideration of karst features present.*
- *Monitoring and inspection reports, public inquiries and agency reviews are checked to confirm that road construction and harvesting activities were carried out consistent with the site plan.*

Ultimately results are compiled as follows:

Calculation	**% HA $_{CONSISTENT}$ = HA $_{CONSISTENT}$ / HA $_{TOTAL}$**	
Variables	% HA $_{CONSISTENT}$	Percentage of the total harvest area consistent with karst management over a 5-year period.
	HA $_{CONSISTENT}$	Harvest area of cutblocks that are consistent[1] with management practices to address karst features over a 5-year period.
	HA $_{TOTAL}$	Total harvest area of cutblocks where felling started[2] over a 5-year period.
Notes	*1. If no karst management practices are required then the cutblock is considered consistent.* *2. Use cutblock felling started dates reported to MoF.*	

CURRENT STATUS – Table 38 summarizes data for cutblocks where felling began over the last 5 years. It shows that 99.5% of the harvest area was consistent with management practices to address karst management.

Table 38 Indicator results for karst management.

Year	Karst Management[1]	Harvest Area Consistent (ha)	Total Harvest Area (ha)	% Consistent
2000	CT042WF, NR002, NR003, SP011, TH001	1,341.1	1,341.1	
2001	AL021WF, BC012, BC014, BC016, BC018, CT059, ML004, NI022, NI024, NI044, NI046, NR001, TN010	1,195.3	1,195.3	
2002	BC018WF, BC102, CA012, CB001, CE003, CE014, CH100, CH101, CT069, CT071, D011, HR066WF, HT056, KA040, KA202, KC100, KC170, KH063A, KH312C, KH500, LG001, LM014, LM015, ME001, NA100, NA200, NE060WF, NS050, P032, TH003, W026WF, Y010H, Y014H, Y018H, Y020A, Y051H, Y053H	1,896.0	1,896.0	99.5%
2003	AL022WF, CE037, CE042, CE056, CU052, DA106, DA325, GC024, HR057, HR155, LG216, LG218, ME100, MQ004WF, NA300, NE005, NE016A, NE104, NS002, TS001, WF051, Y080	1,211.5	1,216.2	
2004	BC202, KC192, KX102, NE102, NE105, UN093	1,348.6	1,377.7	

1 List of cutblocks where felling began that required management practices to address karst features.
2 Harvest area of cutblocks consistent with management practices to address karst features.

STRATEGY AND IMPLEMENTATION SCHEDULE – A karst inventory identifies the vulnerability potential as well as any known features and information is included as new karst features are discovered. Canfor conducts a karst field assessment when a proposed cutblock or road is located within an area mapped as moderate or higher karst vulnerability potential. This assessment includes:

- *Establishing the general bounds for the primary karst catchment associated within the proposed development activity;*
- *Conducting a ground search of appropriate intensity;*
- *Identifying and mapping the locations of cave entrances and significant surface karst features;*
- *Evaluating and classifying caves and other notable karst features; and*
- *Documenting the significant features that are found through measurement, narrative descriptions, illustrations and photography.*

Measures are then recommended to mitigate impacts to the significant cave and karst features. The range of possible protective measures during road building and harvesting phases includes:

- *Relocating roads and cutblock boundaries;*
- *Establishing reserves;*
- *Employing alternative harvest systems;*
- *Enhancing the supervision and monitoring of specific activities;*
- *Restricting road building or harvesting practices;*
- *Imposing weather or timing restrictions for specific activities; and*
- *Committing to manage for or rehabilitate impacted features.*

As necessary, Canfor includes appropriate cave and karst feature management practices in SPs.

MONITORING – An annual survey will be conducted to ensure harvested cutblocks within moderate or greater karst vulnerability were identified. All site-level plans are subject to internal and external inspections. Non-conformances and non-compliances in relation to the plan are communicated to Canfor's Operations Planning Foresters, who will take actions to remedy the particular situations. Karst assessments are tracked in a silviculture database and

prescriptions are considered, as site-level plans are prepared. Monitoring for consistency is summarized in the SFM annual report.

FORECASTING - Karst management is considered as reductions to the harvesting landbase in the periodic timber supply analysis completed for the Nimpkish DFA (see Appendix IV). Cutblock layout and SP preparation considers the karst assessment. It is not appropriate to forecast this indicator, as Canfor's consistency with karst prescriptions is simply a management decision.

Cave Visits

Indicator	*Target*	*Acceptable Variance*
36. Number of documented visits to known caves.	Report the number of documented visits to known caves.	Not required.

JUSTIFICATION - Sometimes cave features are unintentionally impacted in a negative way by cave explorers. Unfortunately, little documented information is available to indicate the use of cave and karst features for recreational or research purposes.

Results for this indicator are reported annually to gauge the recreational and research use of known caves and consider appropriate management strategies. Specific targets and variances are not applicable as Canfor is not responsible for managing cave visits.

DETAILS – This indicator is assessed based on a review of the Huson Lake Visitor comment sheets collected by the Regional District office. Additionally, articles in the BC Caver magazines are reviewed for reference to activities in the Nimpkish DFA.

CURRENT STATUS – Canfor estimates there are 50 significant caves within the Nimpkish DFA. Unfortunately, there is no practical means to accurately gather this information for each cave. Consequently, the number of visits to a popular cave area was selected as a proxy to indicate the level of use in other areas. Results of documented and estimated visits since 2000 in Table 39 show that annually, approximately 680 people explore caves within the Nimpkish DFA.

Table 39 Indicator results for cave visits.

Year	Documented Visits to Huson Lake Caves [1]	BC Caver Newsletter and Other Sources	Estimated Visits by Commercial, Organized and Non-Organized Cavers
2000	361		350
2001	448		350
2002	225		350
2003	349	22	350
2004	243	10	350

1 Regional District of Mount Waddington

STRATEGY AND IMPLEMENTATION SCHEDULE – Cave usage results are collected from all available sources including, but not limited to, visitor's comments at the Huson Lake Caves and the BC Caver Newsletter.

MONITORING – Documented results are gathered and summarized in the SFM annual report.

FORECASTING – Forecasting of this indicator is not required as Canfor is simply reporting the number of documented visits to cave features.

Objective 5.2 (c) Provide opportunities for guiding, trapping, hunting and wildlife viewing.

Economic benefits are derived through guiding, trapping, hunting and wildlife viewing activities. Accordingly, Canfor seeks to provide these opportunities by managing the ability and quality of wildlife habitat. This objective is realized through indicators that address old growth forest management, black bear critical habitat and UWRs.

Old Growth Management Areas

Old growth forests contribute as habitat for various wildlife species. Conserving an appropriate representation of areas managed for old growth forest then, is an appropriate coarse-filter approach to providing opportunities for guiding, trapping, hunting and wildlife viewing. Old growth representation is addressed through indicator 3 (percent OGMA by BEC variant within LUs) and its associated target on page 20.

Black Bear Critical Habitat

Forested areas identified with specific attributes provide critical habitat to maintain black bear populations. Conserving an appropriate representation of black bear critical habitat then, contributes towards providing opportunities for guiding, hunting and wildlife viewing. Black bear critical habitat is addressed through indicator 8 (area conserved for potential black bear denning habitat) and its associated target on page 32.

Ungulate Winter Range

Ungulate winter ranges provide critical habitat to maintain black-tailed deer and Roosevelt elk populations. Conserving an appropriate representation of ungulate winter range then, contributes towards providing opportunities for guiding, hunting and wildlife viewing. Ungulate winter range is addressed through indicator 9 (area conserved for black-tailed deer and Roosevelt elk critical winter range) and its associated target on page 33.

Objective 5.2 (d) Minimize negative effects of resource development on riparian zones.

Fishing is among the recreation and commercial opportunities that provide significant economic benefits to the region. Accordingly, Canfor seeks to protect this resource by minimizing the negative effects of its activities. This objective is realized through an indicator that addresses riparian management.

Riparian Management

Fish streams throughout the Nimpkish DFA provide important habitat for many species of resident and anadromous fish. Exercising appropriate riparian management strategies then, contributes towards minimizing effects of resource development on riparian zones. Riparian management is addressed through indicator 15 (number of medium to high significant non-compliances/ non-conformances with riparian management impacts) and its associated target on page 41.

Objective 5.2 (e) Maintain native botanical forest species.

The harvest of naturally occurring non-timber botanical forest species provides an important economic benefit to the region. Accordingly, Canfor seeks to maintain these species by conserving ecosystem diversity. This objective is realized through indicators that address ecosystem representation in the NHLB and non-timber botanical forest products.

Ecosystems in the Non-Harvestable Forest Landbase

Maintaining a variety of forest ecosystems contributes to provide native botanical forest species. As described in Objective 1.1 (a), conserving an appropriate representation of forest ecosystems then, is an appropriate coarse-

filter approach towards maintaining native botanical forest species. Ecosystem representation is addressed through indicator 1 (percent non-harvestable forest by ecosystem groups) and its associated target on page 15.

Non-Timber Botanical Forest Products

Indicator	*Target*	*Acceptable Variance*
37. Amount and value of non-timber botanical forest products.	Report non-timber botanical forest products harvested and their approximate economic impact.	Not required.

JUSTIFICATION - In BC, there is little information about non-timber forest products and a substantial effort is required to collect relevant information for this indicator. As well, there is uncertainty around which organization or level of government is best suited and responsible for collecting information and reporting on marketed non-timber forest products. Consequently, only one indicator was developed for this criterion. In the absence of readily available information about these products, this indicator reports estimates of the units and values of marketed products, which also considers product quality. Measures of this indicator will highlight trends in the economic benefits derived from non-timber products from local forests and assist in developing strategies for sustaining these benefits over time.

Specific targets and variances are not applicable for this indicator as Canfor is not able to directly influence the amount and value of non-timber forest products.

DETAILS – This indicator is assessed based on confidential information collected from known buying stations in the area and salal pickers who stay at Nimpkish Camp and Rugged Mountain Motel. Canfor maintains a contact list as ongoing reference. In addition, the non-timber botanical forest product representative for the Mount Waddington Regional District is approached to establish additional contacts.

CURRENT STATUS - Three local honey producers routinely enter agreements with Canfor regarding road access and protection of beehives. Canfor issues other agreements with individuals who specifically request permission to access and harvest cedar and pine boughs, salal, fiddleheads and mushrooms. "Consent to cut" letters are used as these botanical products are currently unregulated and Canfor has no authority or means to measure the products. Table 40 reports the estimated amounts and values produced from the Nimpkish DFA. Additional information will be included as it becomes available.

Table 40 Indicator results for non-timber forest products.

NTFP	Units [1]	Value ($)
Mushrooms	800 Pounds	$2,000
Salal	96 Bails	$115,000
Honey	0 Litres	0
Berries	0 Litres	0
Cedar Bark	n/a Pounds	n/a
Cedar Boughs	0 Pounds	0
Pine Boughs	19,000 Pounds	$4,500

1 Summarized for all known NTFP harvested from the Nimpkish DFA in 2004.

STRATEGY AND IMPLEMENTATION SCHEDULE - Active harvests for salal, cedar boughs and mushrooms occur at various times. Generally, these harvests are unregulated with no control over limits or standards. Canfor typically enters agreements with producers of honey (bees) and taxol (from yew bark) to coordinate road maintenance and harvesting activities with their activities. Otherwise, Canfor facilitates the harvest of non-timber forest products by providing access to these resources.

Canfor plans to generate availability/potential mapping for some of the non-timber botanical forest products by December 2007 and field verify the mapping by December 2008. The intent is to identify the site attributes such as

stand type, slope position, and aspect that are critical for each of the reported non-timber botanical forest products. This modeling will facilitate dialogue with producers in such areas as timing of road deactivation activities or suggesting alternate areas of interest, and ultimately incorporate into sustainable forest management decisions.

MONITORING - Canfor does not directly monitor the harvest of botanical forest products from the Nimpkish DFA. Data for estimating amount and value of known non-timber forest products is currently collected through queries to representative producers and buying stations. This data is summarized annually in the SFM annual report.

FORECASTING - The amount and value of non-timber forest products is beyond Canfor's control and there are no effective forecasting tools to predict future trends of these resources. Consequently, forecasting of this indicator is not appropriate.

Objective 5.2 (f) Maintain visual quality in known scenic areas

Tourism is among the recreation and commercial opportunities that provide economic benefits to the region. Canfor acknowledges that although it is difficult to quantify the value that scenic resources provide, known scenic areas should be maintained. This objective is realized through an indicator that addresses consistency with management practices to address visual quality.

Visual Quality

	Indicator	*Target*	*Acceptable Variance*
38.	Percent consistency with management practices to address visual quality.	All cutblocks felled over any 5-year period are consistent with management practices to address visual quality.	-5% of the target.

JUSTIFICATION – Managing and conserving aesthetic values within forested landscapes is an important consideration when proposing harvesting and development projects. This indicator monitors Canfor's consistency with both identifying visual quality objectives and implementing prescriptions for managing visual quality described in site-level plans.

DETAILS – This indicator is assessed at three planning stages:

- *Cutblocks identified within a landscape-level overview of known scenic areas are checked for consistency with planned assessment activities.*
- *The visual landscape section of each site plan is checked for consideration of visual quality.*
- *Monitoring and inspection reports, public inquiries and agency reviews are checked to confirm that road construction and harvesting activities were carried out consistent with the site plan.*

Ultimately results are compiled as follows:

Calculation	**% CB $_{CONSISTENT}$ = # CB $_{CONSISTENT}$ / # CB**	
Variables	% CB $_{CONSISTENT}$	Percentage of cutblocks harvested consistent with visual quality management over a 5-year period.
	# CB $_{CONSISTENT}$	Total number of cutblocks harvested that are consistent with visual quality management over a 5-year period.
	# CB	Total number of cutblocks harvested[2] over a 5-year period.
Notes	*1. If no visual management practices are required then the cutblock is considered consistent.* *2. Use cutblock felling started dates reported to MoF.*	

CURRENT STATUS - Table 41 shows that 99.0% of the total harvest area was consistent with management practices to address visual quality. This is summarized for cutblocks where felling began over the last 5 years.

Table 41 Indicator results for visual quality.

Year	Cutblocks Requiring Visual Quality Management[1]	Harvest Area Consistent[2] (ha)	Total Harvest Area (ha)	% Consistent
2000	AC191, AC192, CU050, CU054, HT017, HT018B, MK037, NW090WF, P056, SC005, TH001, TS054, W032	1,283.8	1,341.1	
2001	BC012, BC016, BC018, CH024, CT031, D030, MK026, NW100H, NW111, VR063, WL001	1,193.5	1,195.3	
2002	BC018WF, CA006, CA012, CB001, CE003, CT069, D011, HT056, KA020, KA040, KA204, KC160, KH312C, LG001, ME001, MK039, NA100, NA200, NE043, NE060WF, NS050, NW743, P032, R122, TK032, TS025, W026WF	1,885.2	1,896.0	99.0%
2003	CU052, DA106, LG216, LG218, ME035, ME100, NA300, NE005, NE016A, NE104, NS060, NW582, NW582H, TK015, TS001	1,215.6	1,216.2	
2004	BC196, BC199, BC222, GC001, KA045, LG214, LG220, LG223, ME030, ME210, NA101, NA113, NA114, NA115H, NE105, NS062, NW010A, NW586, NW902	1,377.7	1,377.7	

1 List of cutblocks where felling began that required management practices to address visual quality.
2 Harvest area of cutblocks consistent with management practices to address visual quality.

STRATEGY AND IMPLEMENTATION SCHEDULE - Canfor conducts regular reviews of the visual landscape inventory. This inventory was completed in 1997 and then updated in 2001 to the latest MoF standards. Based on a combination of major highway corridors, SMZ HLP objectives and existing classification of visual quality, scenic areas were made "known" under the FPC by the MoF's district manager for the North Island – Central Coast Forest District (NCCFD) in 1999.

Canfor conducts a visual impact assessment (VIA) when a proposed cutblock or road is located within a known scenic area. Typically, this assessment involves digital terrain modeling, sight lines, or photo-mosaic exercises. The results of these VIAs are considered in the design and SP prepared for the cutblock, which ultimately addresses the potential visual impact.

MONITORING – All site-level plans are subject to internal and external inspections. Non-conformances and non-compliances are communicated to Canfor's Operations Planning Foresters, who will take actions to remedy the particular situations. VIAs are tracked in a silviculture database and considered as site-level plans are prepared. Monitoring for consistency is summarized in the SFM annual report.

FORECASTING - Visual quality is considered as forest cover requirements in the periodic timber supply analysis completed for the Nimpkish DFA (see Appendix IV). Cutblock layout and SP preparation considers the visual inventory. It is not appropriate to forecast this indicator, as Canfor's consistency with visual quality prescriptions reflects a specific management decision.

Value 5.3 Stability in North Island Communities Supported by the Nimpkish DFA

Providing multiple benefits to society is promoted by addressing the economic viability, access and diversity that contributes to the stability in North Island communities. Four indicators are used to assess the following three objectives developed for this value: a) support Canfor as a globally competitive forest products company, b) provide local access to raw material at fair market price, and c) contribute to the diversified economic base of local communities.

Objective 5.3 (a) Coastal Operations Contribute towards Canfor's overall globally competitiveness

Forest harvesting activities provide the largest economic benefit for many rural communities in BC and sustaining these economic benefits is one of the keys to community stability. SFM plans and practices have the potential to substantially impact the economic value of timber products from an area. Accordingly, this objective addresses the direct economic benefits derived from timber products for the Nimpkish DFA.

The success of Canfor's Coastal Operations, including its employees and contractors, contributes in part, to the stability in North Island Communities, in addition to the profitability of Canfor as a whole. Section 6.3 also discusses the general impact of Canfor's activities.

As a public company listed on the Toronto Stock Exchange, Canfor reports its corporate results annually to its shareholders. Canfor is committed to being globally competitive by building a strong and healthy company. This objective is realized through an indicator that addresses the return on capital employed.

Return on Capital Employed

Indicator	*Target*	*Acceptable Variance*
39. Return on capital employed.	Report the annual and five-year weighted return on capital employed.	Not required.

JUSTIFICATION – Assessing the sustainability of economic benefits to the North Island from Canfor's forest operations requires an indicator that reflects the general financial health of the company. Earnings from the Nimpkish DFA contributes towards Canfor as a whole, which is a large company involving a diverse set of operations (see section 1.1.1). Although there are many approaches for assessing a company's health, the most appropriate indicator directly linked to the Nimpkish DFA is Return on Capital Employed (ROCE) from the annual timber harvest. Results for this indicator are reported annually to illustrate the contributions that Canfor's Coastal Operations provide towards Canfor's overall global competitiveness.

Global market demand is the primary factor affecting operating income. Specific targets and variances are not applicable as Canfor's Coastal operation is not able to significantly influence this demand.

DETAILS – Within Canfor's financial reports, ROCE is internally summarized on a monthly and annual basis as follows:

Calculation	**ROCE = NI / AAE**	
Variables	ROCE	Return on capital employed, calculated as profit before interest, tax and inventory devaluations divided by the difference between total assets and current liabilities.
	NI	Net income, calculated as the profit before interest, tax and inventory devaluations.
	AAE	Average assets employed, calculated as the average total assets subtract the average current liability.

ROCE should always be higher than the rate at which the company borrows, otherwise additional borrowing will reduce shareholders' earnings.

CURRENT STATUS – Canfor tracks and reports ROCE for its Coastal operation annually. Results since 2000 are reported in Table 42. These results include tenures outside of the Nimpkish DFA because all logs are processed at the Beaver Cover dryland sort and source tenure cannot be distinguished. However, they do not significantly affect the average indicators provided.

Table 42 Indicator results for return on capital employed [1].

Year	Net Income ($000s)	Average Assets Employed ($000s)	Annual Return on Capital Employed (%)	5-Year Return on Capital Employed (%)
2000	15,568	57,127	27.3	
2001	(4,595)	55,541	-8.3	
2002	5,836	49,637	11.8	6.9%
2003	(800)	53,267	-1.5	
2004	2,736	55,510	4.9	

1 Accounting results include all Englewood Operations, including Lemare and Atluck/Tahsish units, which are both outside of the Nimpkish DFA.

STRATEGY AND IMPLEMENTATION SCHEDULE – Income and costs incurred from Canfor's Coastal operations are based primarily on the extraction and primary manufacturing of logs. These logs are sold and transported to various secondary manufacturing facilities located locally and in BC's lower mainland. Assets including land, timber, roads, bridges, buildings and equipment are tracked continuously throughout the year as they are constructed, purchased and sold.

MONITORING – Canfor tracks details associated with sales, volumes and costs according to its accounting policies and standard practices. Periodic summaries based on monthly internal reports and quarterly external reports provide the appropriate figures for this indicator that are summarized in the SFM annual report.

FORECASTING – Periodic forecasting of ROCE is done internally as annual timber harvesting plans are prepared. Forecasting this indicator over a longer period requires detailed assumptions around the harvest patterns, the value of standing timber and the costs associated with timber harvest. In BC, this is not a typical analysis because of the myriad of issues involved, which render the results meaningless. However, Canfor will explore an appropriate forecasting approach within its Environmental Program over the next five years.

Objective 5.3 (b) Provide local access to raw material at fair market price.

Providing local forest conversion facilities with access to raw materials is expected to contribute in part, to the stability in North Island Communities. Canfor seeks to make logs available for local purchase at fair market price. This objective is realized through an indicator that addresses local log purchases.

Local Log Purchase

	Indicator	*Target*	*Acceptable Variance*
40.	Volume of logs sold or made available for local purchase at fair market price.	Over a 5-year period, at least 50,000m³/yr of logs will be sold or made available for local purchase at fair market price by community.	-20% of the target.

JUSTIFICATION – Local mills that process logs or special products for secondary manufacturing also contribute to community stability on North Vancouver Island. Their business requires sufficient access to these products, while most logs from the Nimpkish DFA are towed in booms to other facilities within BC's lower mainland. To support local diversification, a steady flow of logs must be available for local purchase at fair market prices.

Canfor's ability to distribute logs to their highest potential use is largely determined by the market conditions and trade agreements in place at the time. Considering the periodic fluctuations in availability and demand, the target for this indicator is set as a minimum annual average tracked over a 5-year period.

DETAILS – This indicator is assessed based on a report generated from Canfor's log sales database, which tracks and summarizes the data according to each customer's location. For the purposes of this objective, local is defined as the North Island, which includes Courtenay and all communities north of Courtenay.

CURRENT STATUS - Table 43 shows that approximately 60,000 m^3/yr of logs were sold annually to local businesses in Port Hardy, Port McNeill, Woss, Campbell River and Courtenay over the past five years. This is 122% consistent with the target for this indicator. During the same period, there were no local log shortages reported.

Table 43 Indicator results for local log purchase. [1].

Year	Community [2]	Volume Sold Locally (m3)	% Consistent over 5 years
2000	n/a	52,277	
2001	n/a	25,751	
2002	n/a	71,263	122%
2003	n/a	101,349	
2004	n/a	54,320	

1 Local mills include all communities north of and including Courtenay.
2 Local log sales will be reported according to community beginning in 2005.

STRATEGY AND IMPLEMENTATION SCHEDULE - Harvesting occurs mainly with the first single pass, but to maximize utilization and value, cedar poles, fir cabin logs, piling logs, bridge crib logs, and bridge stringers are sometimes removed beforehand. The removal of other logs for specialized purposes, such as native trees for cultural purposes (totems, canoes, carvings, lodge logs, etc.), normally occurs before the main harvest as well.

Following the main harvest, other special products are removed such as; cypress cants, cedar shake blocks, cedar cants, and sometimes fir cants. Local salvage operations occasionally pursue these materials from old logged areas as markets and access dictate. Bridge and culvert logs are salvaged during reconstruction or deactivation. More rarely, salvage operations occur on Nimpkish Lake to recover sunken and beached logs.

MONITORING – Canfor monitors the annual sale of logs from the Nimpkish DFA to local markets as well as any local log shortages and summarizes these in the SFM annual report.

FORECASTING - The local demand for logs is beyond Canfor's control and there are no effective forecasting tools to predict future market demand.

Objective 5.3 (c) Contribute to the diversified economic base of local communities.

This objective is realized through indicators that address the number of non-forestry businesses, the distribution of local employees and community contributions.

Non-Forestry Businesses

Indicator	*Target*	*Acceptable Variance*
41. Number and approximate annual revenue of non-forestry businesses associated with the Nimpkish DFA.	Report the number and approximate annual revenue of non-forestry businesses associated with the Nimpkish DFA.	Not required.

JUSTIFICATION – Community stability on North Island is ideally achieved through diversification of its economic base by allowing communities to better withstand shocks in one sector of the economy. While the forestry industry does not control or even directly influence other sectors of local economies, the sustainability of communities, in terms of amenities, is tied to their ability to provide a diversity of work opportunities. Thus the ability of the forest industry to attract and keep a skilled workforce is linked to the diversity of the local economy.

DETAILS – This indicator is assessed based on confidential information collected from known businesses operating within the Nimpkish DFA. Canfor maintains a contact list as ongoing reference.

Specific targets and variances are not applicable for this indicator as Canfor is not able to directly influence the number of non-forestry related businesses.

CURRENT STATUS – This indicator does not include businesses involved in extracting timber or non-timber resources (see indicators 37 and 39). Canfor expects it will take a few years to build a complete and reliable database for this indicator. Table 44 shows that initially, 16 non-forestry businesses are associated with the Nimpkish DFA, totalling approximately seven million dollars in annual revenue.

Table 44 Indicator results for non-forestry businesses.

Category	Number of Non-Forestry Businesses	Average Estimated Annual Revenue [1]	Comments
General Amenities	1	$1,600,000	
Accommodation	1	$110,000	
Restaurant	2	$120,000	
Lumber Mill	1	$1,300,000	
Cedar Salvage	2	$169,619	
Waste Wood	2	$4,650,000	plus 10,000m³ bulk+120,000 bags compost
Outdoor Recreation	4	$288,366	Ski hill & river rafting
Trapping and Guiding	3	$395,700	

1 Summarized for all known activities associated with the Nimpkish DFA between Jan 1, 2002 and Dec 31, 2004.

STRATEGY AND IMPLEMENTATION SCHEDULE – Generally, businesses will develop within communities as associated amenities are available and economic opportunities become favourable. From time to time throughout the year, Canfor's operations may directly or indirectly encounter non-forestry businesses associated with the Nimpkish DFA. Although some businesses are quite public through advertising, many others are obscure from observation and some are rather secretive to maintain a low profile and secure a market advantage. Consequently, besides being very dynamic exercise, an accurate number of non-forestry businesses is difficult to secure.

MONITORING – Throughout the year, Canfor internally tracks these businesses through various sources including, but not limited to: enquiries to the Port McNeill Chamber of Commerce and Mt. Waddington Regional District, telephone directory, internet and mostly through local knowledge and word-of-mouth. Results are then summarized in the SFM annual report.

FORECASTING – The number of non-forestry businesses associated with the Nimpkish DFA is beyond Canfor's control and there are no effective forecasting tools to predict future trends of these businesses. Consequently, forecasting of this indicator is not appropriate.

Local Employees

Indicator	*Target*	*Acceptable Variance*
42. Number of Canfor and contractor employees from local communities.	Report the number of full time Canfor and contractor employees by community.	Not required.

JUSTIFICATION – The number of full-time employees supported by the Nimpkish DFA at least partially affects the stability of North Island communities. Most full time employees locate their families within the region, which creates a demand for a more diverse set of amenities. Although Canfor is not the only employer of full-time personnel in the region, it is easily the largest employer operating within the Nimpkish DFA. Accordingly, this indicator provides a means to quantify the impact that company and government policies have on local employment.

DETAILS – This indicator is based on information collected from Canfor's Human Resources department and Stump to Dump Contractors for the number of employees from local communities. The tallies are for regular full time employees only. Mailing addresses are used to distinguish part time residences from permanent residences.

Canfor's employment levels are a function of its ability to generate income. This is governed primarily by the AAC and global market demand. Specific targets and variances for this indicator are not applicable as Canfor can neither significantly influence markets, nor control where employees and their families must reside.

CURRENT STATUS - Table 45 shows the distribution of Canfor employees by community. Over half of the full time company and contractor employees reside within or adjacent to the Nimpkish DFA. Generally, the number of employees in other communities diminishes as the distance from the Nimpkish DFA increases. Only stump-to-dump contractors are included in these figures because the vast majority of other contracts involve part-time, seasonal work.

Table 45 Indicator results for local employees [1].

Community	Average Number of Full Time Canfor Employees	Average Number of Full Time Contractor Employees [2]	% of Total
North of Port McNeill	11	15	6%
Port McNeill	120	28	32%
Woss	110	4	25%
Sayward	11	3	3%
Campbell River	62	32	21%
Gold River	0	1	0%
Comox Valley	32	4	8%
South of Comox Valley	15	8	5%

1 Summarized for personnel employed between Jan 1, 2004 and Dec 31, 2004.
2 Only stump-to-dump contractors are included.

STRATEGY AND IMPLEMENTATION SCHEDULE – Canfor's employment levels are a function of its annual strategies for generating revenue, the market for logs, the AAC and changes in government policy, such as the recent *Forest Revitalization Act*. As each of these influences are dynamic, specific employment levels are determined as Canfor prepares its annual harvest plans and budget each fall. Additionally, Canfor has no internal policy to dictate where employees must reside.

MONITORING – Annually, figures for this indicator are accessed through the mailing addresses in Canfor's employee records and similar information is solicited from Canfor's stump-to-dump contractors. This information is summarized in the SFM annual report.

FORECASTING – Periodic forecasting of employment levels is done internally as annual timber harvesting plans are prepared. Forecasting this indicator over a longer period is considered meaningless because of the myriad of issues involved around harvest patterns, value of standing timber, costs associated with timber harvest and government policy.

Community Contributions

Indicator	*Target*	*Acceptable Variance*
43. Value of donations and descriptions of in-kind contributions.	Report the value of donations and descriptions of in-kind contributions annually.	Not required.

JUSTIFICATION - Canfor contributes to local communities through wages and benefits to its employees, property taxes and purchases of goods and services. In addition, Canfor provides further support to various community

initiatives through direct donations and in-kind contributions. These contributions enhance the economic base of local communities.

DETAILS – This indicator is based on information collected from Canfor's financial reports. In addition, Canfor's Human Resources department tracks community contributions. For this indicator, direct donations are considered cash given, whereas in-kind contributions are considered non-cash inputs for equipment, services, facilities, materials or products provided where specific values are impractical to assess.

Results for this indicator are reported annually to track the contributions made to communities. Specific targets and variances are not applicable, as Canfor's annual contributions are not specifically assigned.

CURRENT STATUS – Table 46 summarizes Canfor's direct donations and in-kind contributions to the communities associated with the Nimpkish DFA. As this is a new indicator, summaries are only available for 2004.

Table 46 Indicator results for community contributions.

Year	Direct Donations	Description In-Kind Contributions
2004	$11,373	• 42.6 m3 of large merchantable cedar logs to 'Namgis First Nation. • 2 hours backhoe for a skateboard park in the Woss Community. • Building for Woss Fish Hatchery. • Propane for the Kokish Fish Hatchery. • Digital copy of roads for North Island 911. • Ortho-rectified photography of Mt Cain, Woss and Beaver Cove areas for Mount Waddington Regional District.

STRATEGY AND IMPLEMENTATION SCHEDULE – Canfor's internal policies assign the process and total donations available to community organizations. Donations are approved and allocated through Canfor's corporate office, whereas in-kind contributions are managed directly by operations management personnel within the Nimpkish DFA. These decisions are based primarily on the requesting organization's intentions and their proximity to the Nimpkish DFA.

MONITORING – Canfor's donations are tracked through its financial accounting system while descriptions of in-kind contributions will be maintained in a central file beginning 2005. These are summarized in the SFM annual report.

FORECASTING – Forecasting of this indicator is not required as Canfor is simply reporting the value of contributions.

Value 5.4 Fair Distribution of Timber and Non-Timber Benefits and Costs Over Time

Providing multiple benefits to society is promoted by providing fair distribution of timber and non-timber benefits and costs over time. One indicator is used to assess the objective developed for this value: provide fair opportunities for a range of interests to access benefits on the Nimpkish DFA.

Objective 5.4 (a) Provide fair opportunities for a range of interests to access benefits on the Nimpkish DFA

Sustaining flows of multiple benefits is contingent upon the fair distribution of timber and non-timber benefits and costs over time. This objective is realized through indicators that address non –timber forest products, non-forestry businesses and Canfor's compliance with the TFL 37 contractor clause..

Non-Timber Forest Products

Providing fair opportunities for a range of interests to access benefits on the Nimpkish DFA requires an appreciation for the kinds and quantities of non-timber forest products being harvested. Indicator 37 (amount and value of non-timber botanical forest products) and its associated target on page 77 provides an initial documentation of non-timber forest products activities on the DFA.

Non-Forestry Businesses

Another measure of the distribution of benefits and costs is the strength of Non-Forestry Businesses operating on the DFA. Indicator 41 (number and approximate annual revenue of non-forestry businesses associated with the Nimpkish DFA) and its associated target on page 82 provides a current list of the kind and magnitudes of the operations for those businesses.

Contractor Clause Compliance

Indicator	*Target*	*Acceptable Variance*
44. Volume of timber harvested by contractors relative to the total annual timber volume harvested.	Contractors will harvest at least 50% of the total annual timber volume harvested.	Not acceptable.

JUSTIFICATION - The Timber Harvesting Contract and Subcontract Regulation (B.C. Reg. 278/04) and part 14.00 of license agreement obligates Canfor to ensure that each year at least 50% of the annual timber harvested from Schedule B land involves independent logging contractors. For the B.C. coast, the annual timber volume can be harvested under any combination of full contracts, each of which provides for a term of at least 5 years, and phase contracts, each of which provides for a term of at least 2 years.

DETAILS – This indicator is assessed based on procedures outlined in the Timber Harvesting Contract and Subcontract Regulation. The total timber volume attributable under contract is the sum of the volume attributable to full and phase contractors. Compliance with the contractor clause is calculated according to the steps shown in Table 47:

Table 47 Contractor clause performance calculation.

Steps	Contractor Clause Performance Calculation	
1.	Total approved AAC TFL #37 (m^3)	
2.	AAC attributable to schedule "A" lands (m^3)	
3.	AAC attributable to schedule "B" lands (m^3)	
4.	Volume of timber harvested (m^3) Scaled and billed volumes	
5.	Harvested volume attributed to Schedule "A" Lands (m^3)	#2 / #1 x #4
6.	Harvested volume attributed to Schedule "B" Lands (m^3)	#3 / #1 x #4
7.	Total volume contracted (m^3) Full + phase volumes	
8.	Total volume contracted as % of schedule "B" harvested (%)	#7 / #6 x 100
9.	% Compliance of total volume contracted	#7 / #6 / 0.5 x 100

Note: for items 1, 2 & 3, refer to provincial Chief Forester's AAC Determination and Schedule B prorate calculated in section 1.1.4.

CURRENT STATUS - Canfor will comply with Section 14 of the TFL 37 licence agreement concerning harvest allocation to contractors. Over the past decade, compliance with the contractor clause was exceeded by an average of 25% (Table 48). This reflects the increased road building done by contractors in recent years.

Table 48 Indicator results for contractor clause compliance.

Year	Total Harvested Volume from Schedule B Lands (m^3)	Total Volume Contracted (m^3)	Percent Compliance of Total Volume Contracted
1995	816,131	496,341	122%
1996	679,347	504,084	148%
1997	763,068	534,921	140%
1998	627,420	398,874	127%
1999	853,231	562,264	132%
2000	871,440	597,597	137%
2001	636,154	396,225	125%
2002	900,026	531,620	118%
2003	777,693	413,129	106%
2004	819,954	417,314	102%
Average	774,446	485,237	125%

STRATEGY AND IMPLEMENTATION SCHEDULE – Canfor harvests timber with a combination of company employees and various arrangements with contractors. The specific distribution of company and contractor harvest is established as Canfor prepares its annual harvest plans and budget each fall.

MONITORING – As timber is harvested it is scaled and both Canfor and the MoF track the volumes. These scaled volumes are used, among other things, to monitor Canfor 's consistency with contractor harvest compliance. Results are summarized for each calendar year in the SFM annual report.

FORECASTING – Periodic forecasting of the annual contractor harvest is done internally as annual timber harvesting plans are prepared. Forecasting this indicator over a longer period is considered meaningless because decisions around harvest distribution depends on internal and government policy, which are both unpredictable in the long term.

Criterion 6. Accepting Society's Responsibility for Sustainable Development

This criterion seeks to provide fair, equitable and effective forest management decisions. Specific elements include aboriginal and treaty rights, respect for aboriginal forest values, knowledge and uses, public participation and information for decision-making. Specific values identified are: a) aboriginal and treaty rights, b) interests of aboriginal people, c) incorporation of social values in the forest management process, d) informed and inclusive decision making, and e) enhanced decision making process.

Value 6.1 Aboriginal and Treaty Rights

Accepting society's responsibility for sustainable development is promoted by recognizing and respecting aboriginal and treaty rights. Canfor's Environmental Policy is interpreted and extended to include Aboriginal peoples with respect to their rights and interests. Two indicators are used to assess the objective developed for this value: coordinate and manage activities to avoid infringement of aboriginal rights.

Objective 6.1 (a) Coordinate and manage activities to avoid infringement of aboriginal rights.

This objective is realized through indicators that address first nation consultation and their participation on the NWAC.

First Nation Consultation

Indicator	Target	Acceptable Variance
45. Documented opportunities provided to local First Nations for review of operational plans.	All operational plans are accessible for review by local First Nations.	None.

JUSTIFICATION – First Nations' input on proposed operational plans is essential to foster amicable relationships. Amicable relationships with First Nations can lead to partnerships when discussions identify common interests. This indicator is intended to demonstrate Canfor's performance in providing opportunities for First Nations to provide input on operational plans.

DETAILS – This indicator is assessed based on a review of the documented communications with First Nations' reviews of Forest Development Plans (FDP), Forest Stewardship Plans (FSP), Pesticide Management Plans (PMP), MPs and SFM Plans. In addition, invitations to consult regarding management plans are also documented.

CURRENT STATUS – The Nimpkish DFA is located almost entirely within the 'Namgis First Nation territory. Additionally, small areas in the south and north central portions are within the Mowachaht/Muchalaht and the Tlowitsis First Nations' territories.

Canfor seeks active partnerships with the 'Namgis, Mowachaht/Muchalaht and Tlowitsis First Nations to build community relationships and to promote public input in forest MPs. On an annual basis, or more frequently as required, Canfor reviews, consults with and seeks input to FDPs and MPs with these three First Nations. Table 49 identifies the opportunities documented for First Nations to review operational plans. MP 8 was reviewed and approved prior to CSA certification but First Nations will also have an opportunity to review this SFM plan 9. Canfor's first FSP is currently scheduled for the latter part of 2005.

Table 49 Indicator results for First Nation consultation.

Plan	Submission Date	Approval Date	First Nation Consulted	Date of Meeting (Invitation)
FDP 01-46	11/07/2001	02/02/2002	'Namgis	12/13/2001
			Tlowitsis	12/10/2001
			Mowachaht/Muchalaht	01/11/2002
FDP 01-69	03/13/2002	07/09/2002	'Namgis	03/28/2002
			Tlowitsis	05/08/2002
FDP 01-74 (LIA)	03/20/2002	07/05/2002	'Namgis	03/28/2002
FDP 01-78 (expedited)	03/27/2002	04/19/2002	'Namgis	03/28/2002
FDP 01-99 (Chipper)	07/02/2002	09/05/2002	'Namgis	07/26/2002
FDP 01-137	11/12/2002	02/13/2003	'Namgis	12/12/2002
			Tlowitsis	01/07/2003
			Mowachaht/Muchalaht	12/10/2002
FDP 01-141 (LIA)	11/12/2002	02/02/2003	'Namgis	12/12/2002
FDP 01-206	09/19/2003	01/23/2004	'Namgis	10/07/2003
			Tlowitsis	10/14/2003
			Mowachaht/Muchalaht	Unable to attend
FDP 01-265	09/29/2004	03/02/2005	'Namgis	11/16/2004
			Tlowitsis	10/22/2004
			Mowachaht/Muchalaht	12/01/2004
PMP # 124-146-99/05	09/30/2004	11/23/2004	'Namgis	07/15/2004 [1]
Information Package (SFM Plan 9)	09/07/2004	01/04/2004	'Namgis	(01/05/2004)
			Tlowitsis	(01/05/2004)

Plan	Submission Date	Approval Date	First Nation Consulted	Date of Meeting (Invitation)
Draft SFM Plan 9	12/03/2004	Not applicable	Mowachaht/Muchalaht	(01/05/2004)
			'Namgis	(01/05/2004)
			Tlowitsis	(01/05/2004)
Timber Supply Analysis (SFM Plan 9)	04/20/2005	07/05/2005	Mowachaht/Muchalaht	(01/05/2004)
			'Namgis	(05/04/2005)
			Tlowitsis	(05/04/2005)
Twenty Year Plan (SFM Plan 9)	06/14/2005	07/15/2005	Mowachaht/Muchalaht	(05/04/2005)
			'Namgis	(07/22/2005)
			Tlowitsis	(07/22/2005)
			Mowachaht/Muchalaht	(07/22/2005)

1 Notice of intent to treat sent to Namgis First Nation (registered mail). Received response on 08/17/2004.

STRATEGY AND IMPLEMENTATION SCHEDULE - The historical territory determines which First Nations are contacted to review operational plans. The First Nation will be contacted only when an operational plan proposes new activity within their historical territory. The implementation schedule is still evolving with the new legislation, however it is surmised that new FSP, and MP's will be drafted every 5 years.

MONITORING - Monitoring of First Nation's consultation is an ongoing process through the First Nations consultation practices discussed above. Canfor maintains records of invitations for review of FDPs and MPs, and those records are included with those plans. This data is summarized annually in the SFM annual report.

FORECASTING - Canfor will continue to consult with First Nations as forest management activities continue. This consultation will continue before, during and after the treaty process. Forecasting results for this indicator is not applicable because Canfor prepares plans as required, which is unpredictable in the long term.

First Nations Participation on the NWAC

Indicator	*Target*	*Acceptable Variance*
46. First Nations participation on the NWAC.	The three local First Nations' are afforded every opportunity to participate in the NWAC.	Not acceptable.

JUSTIFICATION - The legislated processes for information exchange between First Nations and Canfor include reviews of MPs, FDP, and Herbicide Permits. These processes are technical in content and may only occur every 5 years. First Nations participating on the Nimpkish DFA Public Advisory Committee is an opportunity for information exchange on a regular basis as meetings are held several times a year. First Nations participants have the opportunity to be proactive and educate NWAC members (see section 3.4) on issues of importance and have input on the SFMP direction.

DETAILS – This indicator is assessed based on a review of the NWAC meeting minutes, which indicate First Nations participation at the meetings.

CURRENT STATUS - The NWAC Terms of Reference specifically identifies the three Local First Nations as invited participants in the Public Advisory Committee (see Appendix VII). The 'Namgis First Nation actively participate on NWAC while the Twolitsis – Mumtagila and Mowachat/Muchalat First Nations chose not to participate since the inception of NWAC. Both of these first nations decline to participate on NWAC since only a fringe of their historical territories overlap the Nimpkish DFA. In their opinion, the commitment associated with participating is unwarranted. The Twolitsis – Mumtagila First Nation were informed of meeting dates and minutes were forwarded to them until the fall of 2003 when they requested not to be contacted anymore in regards to NWAC activities. Similarly, the Mowachaht/Muchalaht First Nation requested no further correspondence in regards to NWAC as of the spring of 2004. As the NWAC is a good venue for information sharing, Canfor continues to extend invitations to both the Mowachaht/Muchalaht and Tlowitsis to participate on the Public Advisory Group during consultations of other operational plans. During the information sharing meetings held for the 2004 FDP major amendment, both

First Nations did agree to Canfor sending the draft SFMP for review. Table 50 summarizes the number of NWAC meetings held and number of First Nations' attending for a given year.

Table 50 Indicator results for First Nations participation on the NWAC.

Year	# of NWAC Meetings	# of NWAC Meetings with First Nations Participation
2000	9	5
2001	3	3
2002	1	1
2003	3	3
2004	6	6

STRATEGY AND IMPLEMENTATION SCHEDULE - In addition to the regular consultation with First Nations described under indicator 45 (documented opportunities provided to local First Nations for review of operational plans) on page 88, the three local First Nations will remain as invited participants of the NWAC and efforts will continue to contact and involve Aboriginal forest users and communities in SFM planning. As an example, First Nations contributed several indicators that are of interest to them and were subsequently incorporated into the matrix. This kind of contribution helps to inform the other NWAC participants, including Canfor on First Nations interests. Canfor will maintain the Nimpkish Woodlands Advisory Committee to provide meaningful First Nations input into resource activities in Nimpkish DFA.

MONITORING – This indicator is monitored through the NWAC meeting minutes available on the Coastal FMS website, which identifies participants invited and present.

FORECASTING – Canfor expects to typically host 2 or 3 NWAC meetings a year and will continue to encourage First Nations to participate on the NWAC. Forecasting results for this indicator any further is not applicable because Canfor plans additional NWAC meetings as required, which is unpredictable in the long term.

Value 6.2 Interests of Aboriginal People

Accepting society's responsibility for sustainable development is promoted by respecting interests of aboriginal people. Three indicators are used to assess the two objectives developed for this value: a) investigate and plan for the management of cultural features and values and b) strengthen relationships.

Objective 6.2 (a) Actively investigate and plan for the management of cultural features and values.

This objective is realized through an indicator that addresses management practices to address cultural features.

Cultural Features

Indicator	*Target*	*Acceptable Variance*
47. Percent consistency with management practices to address cultural features.	All cutblocks felled over any 5-year period are consistent with management practices to address cultural features.	-5% of the target.

JUSTIFICATION - Canfor recognizes First Nations historical use of the Nimpkish DFA and that features depicting historical range and use of the forest resource are important to the First Nations culture. By law, significant archaeological sites require protection. In the last 15 years Canfor has only encountered 2 significant archaeological sites, while culturally modified trees (CMT), both pre- and post- 1846, are numerous.

DETAILS – This indicator is assessed at three planning stages:

- *Cutblocks identified within a landscape-level archaeological overview are checked for consistency with planned assessment activities.*
- *The cultural heritage section and archaeological site section of each site plan is checked for consideration of archaeological and cultural heritage features present.*
- *Monitoring and inspection reports, public inquiries and agency reviews are checked to confirm that road construction and harvesting activities were carried out consistent with the site plan.*

Ultimately results are compiled as follows:

Calculation	**% HA $_{CONSISTENT}$ = HA $_{CONSISTENT}$ / HA $_{TOTAL}$**	
Variables	% HA $_{CONSISTENT}$	Percentage of the total harvest area consistent with cultural feature management over a 5-year period.
	HA $_{CONSISTENT}$	Harvest area of cutblocks that are consistent[1] with management practices to address cultural features over a 5-year period.
	HA $_{TOTAL}$	Total harvest area of cutblocks where felling started[2] over a 5-year period.
Notes	• *If no cultural feature management practices are required then the cutblock is considered consistent.* • *Use cutblock felling started dates reported to MoF.*	

CURRENT STATUS –Table 51 shows that 98.1% of the total harvest area was consistent with management practices to address cultural features. This is summarized for cutblocks where felling began over the last 5 years. .

Table 51 Indicator results for cultural features.

Year	Cutblocks Requiring Cultural Feature Management[1]	Harvest Area Consistent[2] (ha)	Total Harvest Area (ha)	% Consistent
2000	CT042WF, CU050, CU054, K303, MK037, NI042, NR002, NR003, SC010, SP011, SP030A, TH001, WE001, WE003	1,341.1	1,341.1	
2001	BC012, BC014, BC016, BC018, CE012, CH024, CT031, CT059, D030, MK026, MK060, ML004, NI022, NI024, NI040, NI044, NI046, NR001, WL001	1,195.3	1,195.3	
2002	BC018WF, BC102, CA012, CB001, CE003, CH100, CH101, CT069, CT071, D011, HR061, HR063, KA204, KH063A, KH312C, KH500, LG001, ME001, MK039, NA100, NA200, NE043, NE060WF, NS001, NS050, NW743, TH003, TK032, W026WF, WE005, Y018H, Y020A, Y022	1,896.0	1,896.0	98.1%
2003	BC220, CT032, CU052, DA106, DA325, HR057, LG216, LG218, ME035, ME100, NA300, NE005, NE016A, NE104, NS002, NS060, NW582, NW582H, SB003H2, TK015, Y080	1,215.6	1,216.2	
2004	BC196, BC199, BC222, DA200, DA305, GC001, K207, KH074, KH400, LG002, ME030, NE032A, NE105, NW010A, NW586, NW902, Q029A, SB003H	1,246.1	1,377.7	

1 List of cutblocks where felling began that required management practices to address cultural features.
2 Harvest area of cutblocks consistent with management practices to address cultural features.

STRATEGY AND IMPLEMENTATION SCHEDULE – Canfor's planners review the location of all proposed cutblocks relative to an archaeological potential map. If the proposed cutblock is located within an area designated with high archaeological potential, or if any observed features are identified during cutblock reconnaissance, an assessment is planned in the Cutblock Manager. First Nations are engaged to conduct a Cultural Heritage Inventory. Where

worker safety is not compromised and in consultation with First Nations, management strategies for CMTs located during the survey is incorporated into the final layout and addressed in the site level plan under the Cultural Heritage section.

MONITORING – Cultural heritage inventories are tracked in a silviculture database and considered as site-level plans are prepared. In addition, Canfor's ITS database tracks non-conformances/non-compliances related to cultural heritage feature management. Monitoring for consistency is summarized in the SFM annual report.

FORECASTING - At this time Canfor has no additional information to suggest an appropriate impact on the timber supply may be further affected by significant archaeological or cultural heritage values. Forecasting is not applicable as this indicator is based on management of cultural heritage features.

Objective 6.2 (b) Strengthen relationships between Canfor and Aboriginal people

This objective is realized through indicators that address first nations participation on the NWAC, employment, agreements and contracts.

First Nation Participation on the NWAC

First Nation's involvement with planning is integral to ensure their concerns and ideas are considered where Canfor is able. Appropriate venues are required to meaningfully engage in discussions at key planning stages and strengthen relationships between Canfor and First Nations. First Nation's participation is addressed through indicator 46 (First Nations participation on the NWAC) and its associated target on page 89.

First Nations Employment

Indicator	*Target*	*Acceptable Variance*
48. Number of First Nations working for Canfor and contractors.	Report by company, the number of First Nations working for Canfor and contractors annually.	Not required.

JUSTIFICATION – Economic and employment opportunities derived from the forest resource are important to First Nations. This indicator is intended to report First Nations employment within the Nimpkish DFA, directly involved in harvesting operations. Several years of reporting should identify trends and assist in future dialogue between Canfor and First Nations.

Specific targets and variances are not applicable for this indicator as Canfor can neither influence its contractors' personnel, nor control the availability of qualified First Nations personnel.

DETAILS – This indicator is assessed based on a review of known First Nation members currently employed, through an inquiry to Canfor department heads and supervisors, as well as stump-to-dump contractors.

CURRENT STATUS – Table 52 lists the number of full time First Nations employed by Canfor and contractors working on the Nimpkish DFA. Several other First Nations were recently employed to work in Canfor's production department but have since resigned to pursue other employment opportunities.

Table 52 Indicator results for First Nations' employment.

Year	First Nations Employed by Canfor	First Nations Employed by Contractors[1]
2000	5	n/a
2001	5	n/a
2002	5	n/a
2003	5	n/a
2004	5	1

1 Contractors include stump-to-dump contractors only.

STRATEGY AND IMPLEMENTATION SCHEDULE – Although Canfor is an equal opportunity employer, successful candidates must posses qualifications and skills required for the vacant position. Good candidates for entry-level positions will indicate that they posses a valid drivers licence and Level 3 first aid certification.

MONITORING - To the best of their knowledge, Canfor's direct line supervisors and contractors identify full time First Nations employees. These results are summarized annually in the SFM annual report.

FORECASTING - Forecasting is not applicable for this indicator as this indicator simply reports the number of full time First Nations employees.

Agreements with First Nations

	Indicator	*Target*	*Acceptable Variance*
49.	Number and description of protocol, joint venture, and/or impacts and benefit agreements signed with First Nations.	Report annually the number and description of protocol, joint venture, and/or impacts and benefit agreements signed with First Nations.	Not required.

JUSTIFICATION – Economic and employment opportunities derived from the forest resource are important to First Nations. This indicator will summarize agreements made between Canfor and First Nations. Several years of reporting should identify trends and identify opportunities for improvement. The results of this indicator will become the basis for further discussions and agreements.

DETAILS – This indicator is assessed based on a review of the formal agreements with First Nations. The Manager, Forestry & Environment, contact person for all FN initiatives, maintains a record of these on file.

Specific targets and variances are not applicable for this indicator as it simply reports on current agreements with First Nations.

CURRENT STATUS – Table 53 describes the current agreements with First Nations on the Nimpkish DFA. Preliminary discussions have begun on at least one more substantial project that will hopefully be reported on for the 2005 SFM annual report.

Table 53 Indicator results for agreements with First Nations.

Agreement	Description
Cultural Heritage Inventory surveys	First Nations crew contracted to conduct cultural heritage inventory surveys on selected planned cut-blocks. Locations of artefacts are located with GPS and a report is submitted to Canfor.
Sponsor a forest program co-op student	Canfor sponsors a First Nations co-op student in a forest program by providing employment and work experience in the summer and financial support during the school year.
First Nations controlled engineering layout crew	A firm was contracted to train a First Nations crew on cutblock engineering through the layout of 2 cut-blocks.
Co-chair the NRMB	Canfor and 'Namgis First Nation co-chair the Nimpkish Resource Management Board (NRMB), which oversees projects such as watershed restoration, lake and river fertilization. There is preferential hiring for members of 'Namgis First Nations to conduct these projects.

STRATEGY AND IMPLEMENTATION SCHEDULE – As the need arises, Canfor and First Nations jointly develop mutually beneficial agreements. There is no limit to the number of these arrangements and discussions exploring various opportunities occur on a fairly regular basis.

MONITORING – First Nations agreements for each calendar year is tracked by Canfor's Forestry and Environment Manager and summarized in the SFM annual report.

FORECASTING – Forecasting is not applicable for this indicator. Implementation of legislation initially introduced in 2003, the Forest Revitalization Act, is expected to have a significant impact on Canfor's relationship with First Nations.

Contracts with First Nations

Indicator	*Target*	*Acceptable Variance*
50. Value and description of contracts annually awarded to First Nations or firms associated with First Nations' interests.	Report the value and description of contracts annually awarded to First Nations or firms associated with First Nations' interests.	Not required.

JUSTIFICATION – Economic and employment opportunities derived from the forest resource are important to First Nations. This indicator will summarize contracts awarded to First Nations or firms associated with First Nations interests. Several years of reporting should identify trends and identify opportunities for improvement. The results of this indicator will become the basis for further discussions and agreements.

Specific targets and variances are not applicable for this indicator as it simply reports on contracts awarded to First Nations or firms associated with First Nations' interests.

DETAILS – This indicator is assessed based on a review of Canfor's contract files. The Manager, Forestry & Environment, contact person for all First Nations initiatives, maintains a record of contracts awarded to First Nations or firms associated with First Nations' interests on file.

CURRENT STATUS - Table 54 describes the contracts annually awarded to First Nations or firms controlled by First Nations. Preliminary discussions have begun on at least one more substantial project that will hopefully be reported on for the 2005 SFM annual report.

Table 54 Indicator results for contracts with First Nations[1].

Contract [2]	Value	
Namgis First Nation -CMT surveys	$15,673	First Nations crew contracted to conduct cultural heritage inventory surveys on selected planned cut-blocks. Locations of artefacts are spatially located using a GPS and a report is submitted to Canfor.
Namgis First Nation – Vernon Lake fertilization	$19,836	Vernon Lake fertilization application.
Woodland Consulting Ltd.	$18,455	Engineering cutblock layout including maps and profiles. (A firm associated with the Namgis First Nation).
Bivouac West Contracting Ltd.	$12,870	Manual brushing contract. (A project associated with the Namgis First Nation).

1Summarized for all appropriate contracts started between Jan 1, 2004 and Dec 31, 2004.
2Includes firms associated with First Nations' interests.

STRATEGY AND IMPLEMENTATION SCHEDULE – As the need arises, Canfor and First Nations jointly enter into mutually beneficial contracts, while discussions exploring contracting opportunities occur on a fairly regular basis.

MONITORING – The value of all First Nations contracts for each calendar year is tracked by Canfor's Forestry and Environment Manager and summarized in the SFM annual report.

FORECASTING – Forecasting is not applicable for this indicator. Implementation of legislation initially introduced in 2003, the Forest Revitalization Act, is expected to have a significant impact on Canfor's relationship with First Nations.

Value 6.3 Incorporation of Social Values in the Forest Management Process

Accepting society's responsibility for sustainable development is promoted by incorporating social values in the forest management process. Three indicators are used to assess the objective developed for this value: a successful venue for public participation.

Objective 6.3 (a) Provide a successful venue for public participation.

This objective is realized through indicators that address NWAC representation, meetings and member satisfaction.

NWAC Representation

Indicator	*Target*	*Acceptable Variance*
51. Number of interest groups represented on the NWAC.	Representatives from 13 interest groups will participate on the NWAC.	-3 from the target.

JUSTIFICATION – Perspectives brought to the NWAC meetings by a diverse membership of stakeholders is critical to generate valuable discussion regarding the sustainable management of resources in the Nimpkish DFA. Large groups are difficult to facilitate and ensure that each member has adequate opportunity to represent their interest area. Therefore, a key to providing a successful venue for public participation is setting a workable number of members and advisors who represent an appropriate array of interests.

DETAILS – This indicator is assessed based on a review of the NWAC meeting minutes, which indicate participation at the meetings by the various interest groups.

CURRENT STATUS –There are currently 13 members, (7 alternates), and 3 advisors actively participating on the NWAC, representing various interest groups:

1. 'Namgis First Nation	Ed Jackson
2. Twolitsis – Mumtagila First Nation	(Invited annually)
3. Mowachat/Muchalat First Nation	(invited annually)
4. Local regional government	Bill Shepherd
5. Local municipal government (Port McNeill)	Gerry Furney (Dan Cooper)
6. Local municipal government (Woss)	Doug Regier (Dave Rushton)
7. Labour/worker	Jack Millar (Glen Robertson)
8. Logging contractor	Bill Nelson (Rob Wood)
9. Value-added	Dennis Nelson
10. Non-Timber Botanical Forest Products	Dan Cooper
11. Wildlife	Ray Lutz
12. Recreation: caving	Martin Davis (Peter Curtis)
13. Recreation: skiing	Tyson Craig (Suzanne Field)
14. Tourism	Mary Borrowman
15. Environment: local	Steve Lacasse
16. Environment: other	(to be confirmed)
17. Ministry of Environment (Parks)	Linda Philipp
18. Ministry of Environment (Ecosystems)	Mac Willing (Advisor)
19. Ministry of Forests (Stewardship)	Glenn Smith (Advisor)
20. Department of Fisheries (federal)	Chris Senger (Advisor)
21. Canfor	Martin Buchanan (Advisor)

STRATEGY AND IMPLEMENTATION SCHEDULE – The NWAC's terms of reference (Appendix VII) is clearly describes on the framework of the advisory group as well as members' roles and responsibilities. These terms also consider replacement of members and changes as new interests are identified. Respecting the NWAC members' voluntary use of their time, Canfor's aim is to ensure the following points are appropriately maintained:

- Frequency of meetings is reasonable
- Climate of meetings is productive and enjoyable
- Understanding of members' role in the process is clear
- Results reflect members' input.

Canfor encourages all members to participate in meetings, but conflicting schedules sometimes prevent members or alternates to attend. Nevertheless, meeting minutes and other outcomes are still forwarded to all members.

MONITORING – This indicator is monitored through the NWAC meeting minutes available on the Coastal FMS website, which identifies participants invited and present. Results are summarized in the SFM annual report.

FORECASTING – Forecasting results for this indicator is not applicable because changes in interest areas and the development of NWAC are unpredictable in the long term.

NWAC Meetings

Indicator	*Target*	*Acceptable Variance*
52. Number of meetings per year.	Organize at least two NWAC meetings per year.	Not acceptable.

JUSTIFICATION – The legislated processes for information exchange between Canfor and the general public include reviews of MP, FDPs, FSPs, and Herbicide Permits. These processes are technical in content and may only occur every 5 years. Meanwhile, an essential component of the SFM planning process involves input from the NWAC (see section 3.4) through organized and structured meetings. NWAC members volunteer their time to attend meetings

so providing them with ample opportunity to contribute to the planning process must be balanced against the time required to stay informed.

DETAILS – This indicator is assessed based on a review of the NWAC meeting minutes, which indicate the number of meetings held annually.

CURRENT STATUS – In the discussion on page 89 for indicator 46 (First Nations participation on the NWAC), the number of meetings per year is given in Table 50. An average of over 4 meetings are held each year, while more frequent meetings are required as SFM plans are prepared or revised.

STRATEGY AND IMPLEMENTATION SCHEDULE – Maintaining input on the SFM plan from the NWAC typically requires a meeting frequency of approximately 2 or 3 meetings a year. At a minimum, these meetings address proposed SFM plan revisions, audit results, annual reports, and annual reviews of the terms of reference. Additional input from the NWAC may be necessary, however, as the SFM plan is revised or new initiatives are proposed.

MONITORING – This indicator is monitored through the NWAC meeting minutes, available on the Coastal FMS website, which specifically identifies dates and venue.

FORECASTING - Canfor expects to typically host 2 or 3 NWAC meetings a year and will continue to encourage all members to participate on the NWAC. Forecasting results for this indicator any further is not applicable because Canfor plans additional NWAC meetings as required, which is unpredictable in the long term.

NWAC Member Satisfaction

Indicator	*Target*	*Acceptable Variance*
53. NWAC members are provided an opportunity to express their satisfaction with the process.	Conduct an annual review of the NWAC Terms of Reference.	Not acceptable.

JUSTIFICATION – An essential component of the SFM planning process involves input from the NWAC (see section 3.4) through organized and structured meetings. Another key to providing a successful venue for public participation is ensuring that members are satisfied with the process and that outcomes reflect their input.

DETAILS – This indicator is assessed based on a review of the NWAC meeting minutes where Terms of Reference identify participants' opportunities to express satisfaction with process.

CURRENT STATUS – The latest review of the NWAC terms of reference was done in April 2004, where no dissatisfaction was expressed with the SFM planning process.

STRATEGY AND IMPLEMENTATION SCHEDULE - Each year, the NWAC reconsiders its terms of reference (Appendix VII). Approval and revisions to the terms requires the approval of all members and Canfor. As a preliminary step to this review, members are provided an opportunity to express their satisfaction with the SFM planning process through a formal survey that solicits concerns and ideas. Results are summarized and distributed to all members prior to discussions for revising the terms of reference.

Furthermore, members resigning from the NWAC are encouraged to submit their reasons to confirm that they were not dissatisfied with the SFM planning process.

MONITORING - This indicator is monitored through the NWAC meeting minutes, available on the Coastal FMS website, which specifically identifies reviews of and changes to the NWAC terms of reference. These results are summarized in the SFM annual report.

FORECASTING - Forecasting results for this indicator is not applicable because the NWAC terms of reference are reviewed annually and changes are unpredictable in the long term.

Value 6.4 Informed and Inclusive Decision Making

Accepting society's responsibility for sustainable development is promoted through informed and inclusive decision-making. One indicator is used to assess the objective developed for this value: providing relevant information to NWAC in a timely manner.

Objective 6.4 (a) Provide relevant information to NWAC in a timely manner

This objective is realized through an indicator that addresses NWAC meeting preparation.

NWAC Meeting Preparation

	Indicator	*Target*	*Acceptable Variance*
54.	NWAC members are prepared for meetings by having background information in advance of meetings.	Provide background material for review, if required, at least two weeks in advance of meetings.	Not acceptable.

JUSTIFICATION – An essential component of the SFM planning process involves input from the NWAC (see section 3.4) through organized and structured meetings. To ensure that the meetings are most productive, members must be well informed, in advance, on the issues being addressed. This indicator is intended to ensure members have ample opportunity to review and understand the background information.

DETAILS – This indicator is assessed based on a review of the correspondence with NWAC participants where dates the information is distributed prior to meetings are indicated.

Canfor will provide all background meeting material to the NWAC members within a minimum of 8 business days prior to the date set for the meeting.

CURRENT STATUS – Table 55 shows that for half of the NWAC meetings held in 2004, a tentative agenda and background material was sent within 14 days prior to the meeting. Records of when material was distributed prior to 2004 are not available.

Table 55 Indicator results for NWAC meeting preparation.

Meeting Date	Date of Material Distribution	# Days in Advance of Meeting
April 19, 2004	March 30, 2004	19
May 03, 2004	April 29, 2004	5
May 31, 2004	May 11, 2004	20
July 6, 2004	July 06, 2004	0
September 7, 2004	September 7, 2004	0
October 25, 2004	October 25, 2004	0

STRATEGY AND IMPLEMENTATION SCHEDULE – Typically, meeting dates are pre-arranged months in advance or as Canfor develops timelines new initiatives. This usually provides adequate time for Canfor to prepare and distribute the background material to the NWAC members.

MONITORING – This indicator is monitored through the NWAC meeting minutes, available on the Coastal FMS website, which specifically identifies the background material and when it was distributed. Results are summarized in the SFM annual report.

FORECASTING - Forecasting results for this indicator is not applicable because the nature of background material required for NWAC is unpredictable in the long term.

Value 6.5 Enhanced Decision Making Processes

Accepting society's responsibility for sustainable development is promoted by enhancing the decision making process. One indicator is used to assess the objective developed for this value: increased understanding of forest ecosystems and resource values.

Objective 6.5 (a) Increase Canfor's understanding of forest ecosystems and resource values.

The decision making process is enhanced as our understanding of forest ecosystems and resource values improves. This objective is realized through an indicator that addresses research, inventory and monitoring projects.

Research and Inventory Projects

	Indicator	*Target*	*Acceptable Variance*
55.	Number of forest based research, inventory or monitoring projects.	Conduct at least three active research, inventory or monitoring projects per year designed to improve Canfor's knowledge base.	Not acceptable.

JUSTIFICATION – Canfor's responsibility towards SFM requires that its employees increase their knowledge of forest ecosystem processes and of their interactions with resource values. This indicator is intended to measure Canfor's commitment towards improving its knowledge base, particularly in relation to adaptive management, monitoring, and effectiveness evaluation of indicators and targets.

DETAILS – This indicator is assessed based on a review of the Environmental Program, FIA funded projects, and applicable strategic planning, wildlife and biodiversity projects.

CURRENT STATUS – Table 56 shows that over the past five years, an annual average of 6 active projects were designed to improve Canfor's knowledge base of forest ecosystems.

Table 56 Indicator results for research and inventory projects.

Year	Number of Active Projects
2000	5
2001	6
2002	9
2003	7
2004	5

STRATEGY AND IMPLEMENTATION SCHEDULE – Based on priorities stated in its environmental program, Canfor undertakes research, inventory and monitoring projects that are specific to current and projected knowledge gaps. Both internal and external funding sources are sought for these projects, which may also be undertaken as partnerships with universities or government agencies. Although projects of this nature are often active over multiple years, specific projects are selected as Canfor prepares its annual budget each fall.

MONITORING - The number of research, inventory or monitoring projects Canfor undertakes each year is tracked through various project managers and summarized annually in the SFM annual report.

FORECASTING - Forecasting results for this indicator is not applicable because specific projects are reviewed and prioritized annually, which is unpredictable in the long term.

5.0 SUMMARY OF COMMITMENTS

The commitments made in this plan are reflected in the indicators and targets assigned to address Management Values and Objectives. Accordingly, monitoring and reporting on these indicators must be internally assigned to ensure that consistent and efficient tracking occurs. This information is summarized in a responsibility matrix, described as Table 57.

Table 57 Responsibility Matrix.

Indicator	Target	Acceptable Variance	Frequency	Responsibility
1. Percent non-harvestable forest by ecosystem groups.	Report the percent non-harvestable forest by ecosystem groups every 5 years.	Not applicable.	5 Years (2010)	Strategic Planning Forester
2. Percent forest interior in the non-harvestable forest by BEC variant within LUs.	Report the percent forest interior in the non-harvestable forest every 5 years.	Not applicable.	5 Years (2010)	Strategic Planning Forester
3. Percent OGMA by BEC variant within LUs	OGMAs are represented across the landscape according to the targets listed by BEC variant within LUs in Table 9.	-10% of the target for each BEC subzone and LU.	5 Years (2010)	Strategic Planning Forester
4. Percent wildlife tree retention by BEC subzone within LUs.	Wildlife tree retention is represented across the landscape and over any 5-year period according to the targets listed by BEC subzone within LUs in Table 10.	Not acceptable.	Annually	Area Forester (Site Plans)
5. Percent internal patch retention by LU, EMU and BEC subzone.	Internal patches are represented across the landscape and over any 5-year period according to the targets listed by LU, EMU, and BEC subzone in Table 11.	-10% of the target for each LU, EMU, and BEC subzone.	Annually	Area Forester (Site Plans)
6. Number of single trees per hectare retained by EMU.	Single trees retained are represented across the landscape and over any 5-year period according to the targets listed by EMU in Table 13.	-10% of the minimum target for each EMU.	Annually	Area Forester (Site Plans)
7. Percent forest influence by EMU.	Forest influence is represented across the landscape and over any 5-year period according to the targets listed by EMU in Table 14	As shown for each EMU in Table 14.	Annually	Area Forester (Site Plans)
8. Area conserved for potential black bear denning habitat.	At least 11,000 ha are conserved as potential black bear denning habitat.	-5% of the target.	5 years (2008)	Strategic Planning Forester
9. Area conserved for black-tailed deer and Roosevelt elk critical winter range.	At least 6,000 ha are conserved as ungulate winter range.	-3% of the target.	5 years (2010)	Strategic Planning Forester
10. Percent consistency with management practices to address special habitat features.	Where worker safety is not compromised, all cutblocks felled over any 5-year period are managed to address special habitat features identified.	Not acceptable.	Annually	Operations Planning Forester (Valuation & Compliance)
11. Area conserved for Queen Charlotte goshawk.	At least 2,000 ha are conserved for Queen Charlotte goshawk nesting and post-fledgling areas.	-5% of the target.	5 years (2010)	Strategic Planning Forester
12. Area conserved for Keen's Long-eared	At least 200 ha are conserved for Keen's Long-eared Bat hibernacula and maternity sites.	-10% of the target.	5 years (2010)	Strategic Planning Forester

Indicator	Target	Acceptable Variance	Frequency	Responsibility
13. Area conserved for Marbled Murrelet nesting habitat.	At least 14,000 ha are conserved for Marbled Murrelet nesting habitat.	-3% of the target.	5 years (2010)	Strategic Planning Forester
14. Percent of forest area surveyed as acceptable free growing stands and proportion that indicates more than one suitable native tree species.	Over a 5-year period, at least 95% of the forest area surveyed are acceptable free growing stands while all inventory labels for these stands indicate more than one suitable native tree species.	-5% of the target.	Annually	Silviculture Forester
15. Number of medium to high significant non-compliances/ non-conformances with riparian management impacts.	No high significant non-compliances/ non-conformances with riparian management impacts.	To be determined following several years of results.	Annually	Operations Planning Forester (Valuation & Compliance)
16. Percent of trees planted from MoF registered seed.	All seed and seed sources used for reforestation over any 5-year period is MoF registered.	Not acceptable.	Annually	Silviculture Forester
17. Percent consistency with established objectives to address WHAs, OGMAs, UWRs and PAs.	All cutblocks felled over any 5-year period are consistent with established objectives to address WHAs, OGMAs, UWRs and PAs.	Not acceptable.	Annually	Strategic Planning Forester
18. Percent consistency with management practices to address rare plants and plant associations.	All cutblocks felled over any 5-year period are consistent with management practices to address rare plants and plant associations.	-5% of the target.	Annually	Strategic Planning Forester
19. Percent consistency with management practices to address forest disease.	All cutblocks felled over any 5-year period are consistent with management practices to address forest disease.	-5% of the target.	Annually	Silviculture Forester
20. Percent consistency with time to control a forest fire.	All forest fires observed over any 5-year period are extinguished or under control by 10:00 a.m. the day after the fire started.	-10% of the target.	Annually	Operations Planning Forester (Valuation & Compliance)
21. Percent of the harvested area that is converted to unproductive sites for road development.	Up to 3.9% of the harvest area over any 5-year period is converted for road development.	+10% of the target.	Annually	Silviculture Forester
22. Average site index of identified trees within change monitoring inventory plots.	Report the average site index of identified trees within change monitoring inventory plots.	Not required.	10 years (2011)	Strategic Planning Forester
23. Percent consistency with annual targets set in the Damaged Timber Plan.	All cutblocks felled over any 5-year period are consistent with annual targets set in the Damaged Timber Plan.	-5% of the target.	Annually	Operations Planning Forester
24. Area converted to non-productive forest land resulting from landslides that are induced by forest development activities	No area is converted to permanent non-productive area, resulting from landslides observed over any 5-year period that are induced by forest development activities.	+10 hectares to the target.	Annually	Silviculture Forester
25. Percent consistency with management practices to address soil disturbance.	All cutblocks felled over any 5-year period are consistent with management practices to address soil disturbance.	-5% of the target.	Annually	Area Forester (Site Plans)
26. Number of medium to high significant non-compliances/ non-conformances with water quality impacts.	No high significant non-compliances/ non-conformances with water quality impacts.	To be determined following several years of results.	Annually	Operations Planning Forester (Valuation & Compliance)

Indicator	Target	Acceptable Variance	Frequency	Responsibility
27. Percent of watershed areas assessed with a high hydrologic condition index.	Report watershed areas according to their hydrologic condition index.	To be derived as appropriate targets are developed.	5 years (2006)	Strategic Planning Forester
28. Amount of carbon stored in the forested ecosystem by carbon pool (mega tonnes of carbon).	Report the carbon stored in the forested ecosystem by pool every 10 years.	To be derived as appropriate targets are developed.	10 years (2006)	Strategic Planning Forester
29. Average carbon sequestration rate in the forested ecosystem by carbon pool (mega tonnes of carbon per year)	Report the average carbon sequestration rate in the forested ecosystem by carbon pool every 10 years.	To be derived as appropriate targets are developed.	10 years (2006)	Strategic Planning Forester
30. Documented communications with other forest developers that potentially impact the THLB.	Stress the minimization of losses in all referrals that have the potential to remove land from the THLB.	Not acceptable.	Annually	Operations Planning Forester (Valuation & Compliance)
31. Percent of disturbed areas with reforestation obligations that are satisfactorily regenerated.	Over a 5-year period, all disturbed areas with reforestation obligations are satisfactorily regenerated.	-5% of the target.	Annually	Silviculture Forester
32. Total volume harvested relative to the AAC authorized over the cut control period.	The volume harvested does not exceed the total AAC authorized for the cut control period.	+10% to the target.	Annually	Strategic Planning Forester
33. Harvest profile by area for: economic operability, logging type, tree species, and stand type.	The area harvested does not exceed the key profile targets listed in Table 36 for the cut control period.	As shown for each key profile in Table 36.	Annually	Strategic Planning Forester
34. Number of maintained recreation sites.	At least eight campsites are maintained between June 15 and September 15 each year.	-1 campsite.	Annually	Operations Planning Forester (Valuation & Compliance)
35. Percent consistency with management practices to address karst features.	All cutblocks felled over any 5-year period are consistent with management practices to address karst features.	-5% of the target.	Annually	Strategic Planning Forester
36. Number of documented visits to known caves	Report the number of documented visits to known caves.	Not required.	Annually	Operations Planning Forester (Valuation & Compliance)
37. Amount and value of non-timber botanical forest products.	Report non-timber botanical forest products harvested and their approximate economic impact.	Not required.	Annually	Operations Planning Forester (Valuation & Compliance)
38. Percent consistency with management practices to address visual quality.	All cutblocks felled over any 5-year period are consistent with management practices to address visual quality.	-5% of the target.	Annually	Strategic Planning Forester
39. Return on capital employed.	Report the annual and five-year weighted return on capital employed.	Not required.	Annually	Divisional Accountant
40. Volume of logs sold or made available for local purchase at fair market price.	Over a 5-year period, at least 50,000m³/yr of logs will be sold or made available for local purchase at fair market price by community.	-20% of the target.	Annually	Divisional Accountant
41. Number and approximate annual revenue of non-forestry businesses associated with the Nimpkish DFA.	Report the number and approximate annual revenue of non-forestry businesses associated with the Nimpkish DFA.	Not required.	Annually	Operations Planning Forester (Valuation & Compliance)

Indicator	Target	Acceptable Variance	Frequency	Responsibility
42. Number of Canfor and contractor employees from local communities	Report the number of full time Canfor and contractor employees by community.	Not required.	Annually	Operations Planning Forester (Valuation & Compliance)
43. Value of donations and descriptions of in-kind contributions.	Report the value of donations and descriptions of in-kind contributions annually.	Not required.	Annually	Operations Planning Forester (Valuation & Compliance)
44. Volume of timber harvested by contractors relative to the total annual timber volume harvested.	Contractors will harvest at least 50% of the total annual timber volume harvested.	Not acceptable.	Annually	Silviculture Forester
45. Documented opportunities provided to local First Nations for review of operational plans	All operational plans are accessible for review by local First Nations.	None.	Annually	Operations Planning Forester (Valuation & Compliance)
46. First Nations participation on the NWAC.	The three local First Nations' are afforded every opportunity to participate in the NWAC.	Not acceptable.	Annually	Operations Planning Forester (Valuation & Compliance)
47. Percent consistency with management practices to address cultural features.	All cutblocks felled over any 5-year period are consistent with management practices to address cultural features.	-5% of the target.	Annually	Strategic Planning Forester
48. Number of First Nations working for Canfor and contractors.	Report by company, the number of First Nations working for Canfor and contractors annually.	Not required.	Annually	Operations Planning Forester (Valuation & Compliance)
49. Number and description of protocol, joint venture, and/or impacts and benefit agreements signed with First Nations.	Report annually the number and description of protocol, joint venture, and/or impacts and benefit agreements signed with First Nations.	Not required.	Annually	Operations Planning Forester (Valuation & Compliance)
50. Value and description of contracts annually awarded to First Nations or firms associated with First Nations' interests.	Report the value and description of contracts annually awarded to First Nations or firms associated with First Nations' interests.	Not required.	Annually	Operations Planning Forester (Valuation & Compliance)
51. Number of interest groups represented on the NWAC	Representatives from 13 interest groups will participate on the NWAC.	-3 from the target.	Annually	Operations Planning Forester (Valuation & Compliance)
52. Number of meetings per year.	Organize at least two NWAC meetings per year.	Not acceptable.	Annually	Operations Planning Forester (Valuation & Compliance)
53. NWAC members are provided an opportunity to express their satisfaction with the process.	Conduct an annual review of the NWAC Terms of Reference.	Not acceptable.	Annually	Operations Planning Forester (Valuation & Compliance)
54. NWAC members are prepared for meetings by having background information in advance of meetings.	Provide background material for review, if required, at least two weeks in advance of meetings.	Not acceptable.	Annually	Operations Planning Forester (Valuation & Compliance)
55. Number of forest based research, inventory or monitoring projects.	Conduct at least three active research, inventory or monitoring projects per year designed to improve Canfor's knowledge base.	Not acceptable.	Annually	Operations Planning Forester (Valuation & Compliance)

6.0 SUMMARY OF CHANGES AND IMPACTS

6.1 SFM PLAN EXPERIENCE SINCE REGISTRATION IN 2000

The following section points out the key items learned from implementing Canfor's SFM Plans over the past 5 years.

6.1.1 Planning

- *The SFM Plan was the vehicle used to prioritize and where possible, combine landbase constraints: UWRs, OGMAs, ecosystem-based harvesting and strategies for threatened wildlife species.*
- *Updating the SFMP to the CSA Z809-2002 Standard provided Canfor an opportunity to refine its indicators and targets to link strategic with operational measures. Impacts of these activities can be identified and incorporated more easily into land use decision-making.*

6.1.2 Implementation and Operation

- *Based on the stability of its membership to date, the NWAC has been quite successful. Critical to that success is recognizing and balancing the interests of both the members and Canfor.*
- *Providing data for annual reports has been challenging and inconsistent, particularly where individuals responsible for collecting the data have changed. Indicators and targets were refined and clarified using a consistent, systematic approach.*
- *Training is a key component for successful implementation and continual improvement.*

6.1.3 Checking and Corrective Action

- *Continual improvement to enhance the effectiveness our systems is a constantly developing process. It forces owners to examine root causes, rather than just looking at rules.*

6.1.4 Management Review

- *Amalgamating the EMS and SFM into a FMS is one example of improving the effectiveness of our systems. Similarly, merging three separate plans (SFMP, MP, Forestry Principles) into a single SFM Plan will decrease conflicts and inconsistencies, while reducing costs.*
- *From planning through to implementation on the ground, internal systems have raised confidence in activities to the point where legislative requirements are less disconcerting.*

6.2 COMPARISON BETWEEN MP 8 AND SFM PLAN 9

Under section 2.09(i) of the TFL 37 licence agreement, Canfor must highlight the key similarities and differences between this SFM plan 9 and the management plan currently in effect, MP 8. These summaries are organised below.

During the term of MP 8, the TFL agreement was revised to replace the previous 30-month process with a streamlined 20-month process.

The format of SFM plan 9 was reorganized to integrate both the TFL MP requirements and the CSA SFM plan requirements.

6.2.1 Landbase

Table 58 summarises the key landbase similarities and differences between MP 8 and SFM plan 9. Details explaining these differences are provided in the information package (Appendix III). Generally, the area changes result from two issues: a) the Nimpkish DFA slightly increases the scope the plan to address CSA certification requirements, and b) additional removals from the operable landbase to address non-timber values.

Table 58 Landbase comparison between MP 8 and SFM plan 9.

	MP 8	SFM plan 9	Difference
Total Area (including parks)	188,745 ha	196,485 ha	104.1 %
Total Area (excluding parks)	177,323 ha	178,030 ha	100.4 %
Productive Forest Area	153,607 ha	151,746 ha	98.8 %
Current Net Operable Area	103,248 ha	96,965 ha	93.9 %
Long-term Net Operable Area	101,080 ha	95,800 ha	94.8 %

6.2.2 Growth and Yield

Table 59 summarises the key growth and yield similarities and differences between MP 8 and SFM plan 9. These reflect the most current growth and yield assumptions. Details explaining these differences are provided in the information package (Appendix III).

Table 59 Growth and yield comparison between MP 8 and SFM plan 9.

	MP 8	SFM plan 9	Difference
Net area of existing mature stands	43,798 ha	45,363	104%
Net area of existing immature stands	59,450 ha	45,961	77%
Commencement of managed stands (yr.)	1960	1961	100%
Minimum harvest age (MHA) [1]	80.4	81.9	106%
Mean annual increment at MHA [2]	11.5 m3/ha/yr	8.5 m3/ha/yr	74%
Net volume at MHA	858 m3/ha	569 m3/ha	66%

1 Weighted average results of future managed stands over the current net operable landbase.
2 In MP8, MHA was set at culmination age, whereas MHAs for SFM plan 9 were not. At culmination age, the MAI for SFM plan 9 is 9.24 m3/ha/yr.

6.2.3 Planning

During the term of MP 8, Canfor implemented three significant planning initiatives:

- *Canfor's Forestry Principles (see section 2.1.3)*
- *ISO Environmental Management System (see section 2.2.1)*
- *CSA Sustainable Forestry System (see section 2.2.2)*

6.3 IMPACT SUMMARY OF IMPLEMENTING MP 8

Section 2.09 (i) of the TFL 37 licence agreement, requires a summary of the impact, if any, of implementing the current MP in effect, MP 8.

6.3.1 Harvest Levels

Harvest levels remained constant between the previous Management and Working Plan 7 and MP 8, and throughout the term of MP 8, including the two-year extension of MP 8. This reflected the stable available timber supply presented in past MPs.

6.3.2 Employment Opportunities

Table 60 shows the estimated contribution that the flow of fibre from the Nimpkish DFA provides on current employment for the B.C. coast. These figures are derived from the latest socio-economic analysis completed by for the Kingcome TSA. Provincially, a total of 1,303 direct jobs and 1,551 indirect and induced jobs are supported by the annual harvest from the Nimpkish DFA.

Table 60 Estimated employment status.

Activity	DFA Employment [1] (person-years)	Provincial Employment [1] (person-years)
Harvesting	160	481
Silviculture	21	53
Processing	117	769
Total Direct	299	1,303
Indirect and Induced	299	1,581
Total Employment	598	2,884

1 Employment estimates are derived from Table 17 of MoF Kingcome TSA Analysis Report, November 2001

6.3.3 Economic Opportunities

Descriptions of specific indicators and targets involving economic benefits and opportunities are discussed above in Criterion 5 of section 4.0.

The economic contribution estimates given in Table 61 include employment and before-tax income of workers supported by the harvesting, silviculture and processing of Canfor's timber harvest allocation. These figures are derived based on the current AAC of 1,068,000 m3/year and the employment estimates in Table 60.

Table 61 Employment income estimates.

Job Type	Income Factor [1] ($/person-year)	Total ($ millions/year)
Direct	47,125	61.404
Indirect/Induced	30,800	48.695

1 Average incomes are derived from Table 18 of MoF Kingcome TSA Analysis Report, November 2001.

The provincial government receives stumpage payments, various taxes and other revenues from the forest industry in exchange for the rights to harvest and use its timber. Estimates of average provincial government revenues are given in Table 62.

Table 62 Estimate of provincial government revenue.

Revenue Type	Revenue Factor [1] ($/m3)	Total [2] ($ millions/year)
Provincial income tax	7.531	8.043
Industry taxes	0.780	0.833
Stumpage and rents [3]	24.70	26.380

1 Source MoF and Price Waterhouse, Timber Supply Review - Kingcome TSA Analysis Report, November 2001.
2 Derived using Canfor's portion of the current AAC (1,068,000 m3/year).
3 Stumpage and rents are specific to the Nimpkish DFA averaged 2000-2003.

In combination, income and revenue generated through Canfor's allocation and use of fibre from the Nimpkish DFA contribute a total of $145.4 million, or $136/m3, towards the provincial economy.

6.3.4 Non-timber Values

During the term of MP 8, Canfor applied many approaches to protect non-timber resources within the Nimpkish DFA. These strategies ranged from spatial constraints from a landscape level, to implementing standards and

specifications through Canfor's EMS (see section 2.2.1). Through its commitment to SFM, Canfor continues to seek a balance between environmental, social and economic values.

6.4 IMPACT SUMMARY OF IMPLEMENTING SFM PLAN 9

Changes to the management responsibilities discussed in section 1.1.2 may, in turn, affect the expected impacts on Canfor's management practices and standards.

Section 2.09 (i) of the TFL 37 licence agreement, requires a summary of the impact, if any, that implementing SFM plan 9 may to have on the factors given below. However, components of the approval process for this SFM plan are not yet complete and specific impacts are not fully developed. The discussion below is therefore, restricted to general impacts expected for each factor. Specific impacts will be refined and presented in the proposed SFM plan 9.

6.4.1 Harvest Levels

At this time, the provincial Chief forester has not yet considered the applicable information for an AAC determination. The base case harvest forecast developed through the timber supply analysis suggests, however, that there will be a significant decline in the AAC proposed for the period of SFM Plan 9 (see appendix IV). As a result of changes to the THLB, forest cover requirements and growth and yield assumptions, Canfor expects that the current harvest level for TFL 37 will decline by over 9% in 2006.

Another significant change expected the period of SFM plan 9 involves section 2 of the Forest Revitalization Act (Bill 28), where the AAC of Canfor's replaceable licenses on the coast is reduced by nearly 29%. This legislated redistribution will reduce Canfor's harvest on the Nimpkish DFA by approximately 8%, while Canfor's other replaceable licenses on the coast are totally reallocated.

Overall, harvest levels for Canfor's operations on TFL 37 are expected to drop to approximately 850,000 m3/yr, 20% of the current AAC.

6.4.2 Employment Opportunities

Typically, a decrease in harvest level is will cause a direct negative impact on employment opportunities. Measures for mitigating employment impacts were suggested in the VILUP through: a) periodic shutdowns, b) alternative employment opportunities, and c) new log supplies, which might sustain existing opportunities. The VILUP also suggested that employment intensity is declining due to technological change and industry rationalisation.

The number of persons directly and indirectly employed from the Nimpkish DFA operations is partly related to the AAC determined by the provincial Chief Forester. A decline in the AAC determined for the SFM plan 9 period should therefore reduce the level of employment by a similar margin.

6.4.3 Economic Opportunities

Economic opportunities provided from the Nimpkish DFA are also partly related to the AAC determined by the provincial Chief Forester. Certainly, Canfor's return on investments is more a function of the costs associated with extracting, manufacturing, marketing and delivering products to customers and the sales price that they are willing or able to pay. Yet payments that the provincial government receives through stumpage, various taxes and other revenues are likely to be affected.

Areas most vulnerable to a harvest reduction exist where forestry dominates as a source of income. Families leaving the area to seek other opportunities and a loss of local industrial operations could also affect local communities through a reduction in municipal tax revenues and potential loss of locally, provincially and federally funded services.

6.4.4 Non-timber Values

Benefits associated with non-timber values are expected to increase as harvest levels decrease. This is explained in part through the additional constraints for non-timber values. Assuming the actual area has not changed, forest assets associated with the Nimpkish DFA are simply redistributed from timber values to non-timber values.

7.0 SFM PLAN DISTRIBUTION AND REVISIONS

A copy of the both the draft and proposed SFM plan 9 text will be distributed to each of the NWAC members, which includes First Nations, and according to Table 63.

Table 63 Distribution of the SFM plan 9.

Distribution	Organization	Unit	Address
Timber Tenures Forester	MoF	Timber Tenures Section	PO Box 9510, Stn Prov Govt Victoria, BC V8W9C2
Regional Executive Director	MoF	Coast Forest Region	2100 Labieux Road Nanaimo, B.C., V9T 6E9
District Manager	MoF	North Island – Central Coast Forest District	PO Box 7000 Port McNeill, B.C., V0N 2R0
Senior Planning Biologist	MSRM	Vancouver Island Region	101 - 370 South Dogwood Street Campbell River BC V9W 6Y7
Senior Habitat Biologist, Forestry	MWLAP	Vancouver Island	2080 Labieux Rd Nanaimo, BC V9T 6J9
CSA Certification Auditor	KPMG Quality Registrar Inc.	Forestry Specialist Group	Box 10426 777 Dunsmuir Street, Vancouver, B.C., V7Y 1K3
NWAC Members	NWAC	Nimpkish DFA	See indicator 51 on page 95.

A copy of the SFM plan 9 will also be available for public review at Canfor's divisional and corporate offices and through Canfor's corporate website: http://wwwmirror2005.canfor.ca/sustainability/certification/csa.asp

Under circumstances described in section 2.38 of Canfor's TFL 37 agreement, the provincial Chief Forester may require that SFM plan 9 be amended. Alternatively, Canfor may propose revisions to achieve its management objectives. In either case, copies of any amendments or additions to SFM plan 9 will be distributed to the offices listed above.

8.0 ANNUAL REPORT

By March 31 of each year, Canfor will prepare an annual report that provides an update on Canfor's performance in achieving the objectives of the SFM plan 9 and any provincial Chief Forester directives. In this report a brief description of the background and current status of each indicator is provided. In some cases, recommendations are also provided.

Similar to the SFM plans, Canfor intends to integrate the SFM annual reports for both the TFL MP and CSA SFM plan into a single report. Copies of Canfor's SFM annual report will be distributed will be distributed to each of the NWAC members and according to the distribution list in Table 64.

Table 64 Distribution of SFM Annual Report.

Distribution	Organization	Office	Address
District Manager	MoF	North Island – Central Coast Forest District	PO Box 7000 Port McNeill, B.C., V0N 2R0
Regional Manager	MoF	Vancouver Forest Region	2100 Labieux Road Nanaimo, B.C., V9T 6E9
CSA Certification Auditor	KPMG Quality Registrar Inc.	Forestry Specialist Group	Box 10426 777 Dunsmuir Street, Vancouver, BC V7Y 1K3
NWAC Members	NWAC	Nimpkish DFA	See indicator 51 on page 95.

A copy of Canfor's SFM annual report will also be available for public review at Canfor's divisional, regional and corporate offices and through Canfor's corporate website:
http://wwwmirror2005.canfor.ca/sustainability/certification/csa.asp

9.0 REFERENCE LIST

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10.0 ABBREVIATIONS AND DEFINITIONS

AAC	(Allowable Annual Cut): The annual rate of timber harvesting specified for an area of land by the chief forester of the BC Ministry of Forests. The chief forester sets AACs for timber supply areas (TSAs) and Tree Farm Licences (TFLs) in accordance with Section 8 of the Forest Act.
AM	(Adaptive Management) A learning approach to management that incorporates the experience gained from the results of previous actions into decisions. It is a continuous process requiring constant monitoring and analysis of the results of past actions that are used to update current plans and strategies.
Anadromous	Anadromous fish are those that begin life in freshwater, but leave to spend part of their life rearing in the ocean before returning to freshwater to spawn as sexually mature adults. Anadromous salmonids include coho salmon, chinook salmon, pink salmon, chum salmon, sockeye salmon, steelhead (rainbow) trout, cutthroat trout, Dolly Varden char and bull trout.14
BCTS	(British Columbia Timber Sales) An independent organization within the B.C. Ministry of Forests created to develop Crown timber for auction to establish market price and capture the value of the asset for the public. The vision of BC Timber Sales is to be "An effective timber marketer generating wealth through sustainable resource management".
BEC	(Biogeoclimatic Ecosystem Classification) A hierarchical classification scheme having three levels of integration; regional, local and chronological; and combining climatic, vegetation and site factors. The hierarchical classification includes Biogeoclimatic Zone⇒ sub-zone ⇒ variant⇒ site series.
BEC Variant	A subdivision of a biogeoclimatic subzone. Variants reflect further differences in regional climate and are generally recognized for areas slightly drier, wetter, snowier, warmer or colder than other areas in the subzone.
BEC Zone	A geographic area having similar patterns of energy flow, vegetation, and soils as a result of a broadly homogenous macroclimate. British Columbia has 14 biogeoclimatic zones, of which the CWH (Coastal Western Hemlock), and MH (Mountain Hemlock) are found in the Nimpkish Valley.
Biodiversity	(or biological diversity) The variability among living organisms from all sources including inter alia terrestrial, marine, and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.4
BEO	(Biodiversity Emphasis Option) The VILUP outlines a range of three options for emphasizing biodiversity at the landscape level: high, intermediate and low. Each option is designed to provide a different level of natural biodiversity and a different risk of losing elements of natural biodiversity. In reality, these options are points on a continuum, and in between lie a range of options that may be selected depending on the relative priority allocated to biodiversity conservation and timber production in an area.
Blue-listed Species	In British Columbia, the designation of an indigenous species, sub-species, or population as being vulnerable or at risk because of low or declining numbers or presence in vulnerable habitats. Included in this classification are populations generally suspected of being vulnerable, but for which information is too limited to allow designation in another category.6
Botanical Forest Products	Non-timber based products gathered from forest and range land. There are seven recognized categories: wild edible mushrooms, floral greenery, medicinal products, fruits and berries, herbs and vegetables, landscaping products, and craft products.1
Canfor	(Canadian Forest Products Ltd. – also CFP in other documents) A leading integrated forest products company based in Vancouver, British Columbia.
CCFM	(Canadian Council of Forest Ministers) A task force formed in 1995 to guide the development and implementation of criteria and indicators towards sustainable forest management in Canada.
CDC	(Conservation Data Centre) The British Columbia Conservation Data Centre (CDC) (see Blue-listed and Red-listed Species). The staff specialists at the CDC, in co-operation with scientists and specialists throughout the province, have identified those vertebrate animals, vascular plants and plant associations communities in the province, which have become most vulnerable. Each of these rare and endangered species and plant communities associations has been assigned a global and provincial rarity rank according to an objective set of criteria established by The Nature Conservancy of the United States, and a status on the provincial Red or Blue lists.

CMI	(Change Monitoring Inventory) A permanent plot design that allows for the repeated measuring of forest attributes at defined locations to provide status and trend data.
CMT	(Culturally Modified Tree) A tree that has been altered by native people as part of their traditional use of the forest. Non-native people also have altered trees, and it is sometimes difficult to determine if an alteration (modification) is of native or non-native origin. There are no reasons why the term "CMT" could not be applied to a tree altered by non-native people. However, the term is commonly used to refer to trees modified by native people in the course of traditional tree utilization.
Compliance	The conduct or results of activities in accordance with legal requirements.
Conformance	Meeting non-legal requirements such as polices, work instructions or standards.
COSEWIC	The Committee on the Status of Endangered Wildlife In Canada (COSEWIC) determines the national status of wild Canadian species, sub-species and separate populations suspected of being in danger. It bases its decisions on the best up-to-date scientific information available.
CWD	(Coarse Woody Debris) The larger dead and mostly down woody material that is in various stages of decomposition. Sound and rotting logs and stumps that provide habitat for plants, animals and insects and a source of nutrients for soil development. Material generally greater than 8–10 cm in diameter.
dbh	(Diameter at Breast Height) The outside-bark stem diameter of a tree measured at breast height, 1.3 metres above the high side of the ground.
DFA	(Defined Forest Area) A specified area of forest, including land and water (regardless of ownership or tenure) to which the requirements of the CSA SFM system standard apply.
Ecosystem	A dynamic complex of plants, animals, and micro-organisms and their non-living environment interacting as a functioning unit. The term "ecosystem" can describe small-scale units, such as a drop of water, as well as large-scale units, such as the biosphere.4 Ecosystems are commonly described according to the major type of vegetation, for example, forest ecosystem, old growth ecosystem, or range ecosystem.1
Ecosystem Group	A prerequisite for ecosystem representation analysis and interpreting results is to classify mapped ecosystems into a manageable number of groups. An ecosystem group is one or more site series of relatively similar plant communities characteristics that also consider ecosystem abundance and sensitive plant communities.
EFZ	(Enhanced Forestry Zone) The government's announcement of the VILUP characterised three types of resource management zones (RMZs). Among these, EFZs are designated as priority use areas suitable for intensive resource development (typically forestry), with due consideration to other resource values.
Element	A concept used to define the scope of each CCFM SFM criteria. Each CCFM SFM criterion contains several elements. The CSA SFM elements were derived from national-scale elements developed by the CCFM for more specific local applications. The elements serve to elaborate and specify the scope of their associated criterion.
EMS	(Environmental Management System) An Environmental Management System is a set of standards established by the International Organisation for Standardization (ISO 14001). This process includes commitment, public participation, preparation, planning, implementation, measuring and assessing performance, and review and improvement of a management system. The incorporation of feedback loops into the process allows for ongoing enhancement of the integrity and performance of the management system, and is designed to lead to continual improvement.
Ecosystem-Based Management	A management approach that recognizes the natural variability of an ecosystem and attempts to emulate theses natural responses with man-made disturbances, while managing forests for a range of values. Specific practices maintain ecosystem principles into planning at the landscape level.
EMU	(Ecosystem Management Unit) Stratification of a forest area into zones based on a combination of ecological processes and higher-level plan objectives. These designations facilitate the implementation of ecosystem-based management.
EPRP	(Emergency Preparedness and Response Plan) A plan detailing how a company intends to prepare for (e.g., equipment location, who to call, etc.) and respond to (i.e., actions to be taken) emergency incidents.

FDP	(Forest Development Plan) An operational plan guided by the principles of integrated resource management (the consideration of timber and non-timber values), which details the logistics of timber development over a period of usually five years. Methods, schedules, and responsibilities for accessing, harvesting, renewing, and protecting the resource, are set out to enable site-specific operations to proceed.
FMS	(Forest Management System). FMS is a systematic means of identifying, addressing and managing environmental impacts and sustainable forest management commitments within Canfor's Woodlands operations.
Forecast	An explicit statement of the expected future condition of an indicator.
Forest	An ecosystem dominated by trees and other woody vegetation growing more or less closely together, its related flora and fauna, and the values attributed to it.
FPC	(Forest Practices Code) The Code is a term commonly used to refer to the Forest Practices Code of BC Act, the regulations made by Cabinet under the act and the standards established by the chief forester. The term may sometimes be used to refer to field guides as well. It should be remembered that unlike the act, the regulations and standards, field guides are not legally enforceable.
FRA	(Forest and Range Agreement) Interim agreements between the MoF and eligible First Nations designed to provide for "workable accommodation" of aboriginal interests that may be impacted by forestry decisions during the term of the agreement, until such time as those interests are resolved through treaty. These agreements provide the Ministry with operational stability and assist First Nations to achieve their economic objectives by providing revenue and direct award of timber tenure.
FRPA	(Forest and Range Practices Act) This act and its regulations govern the activities of forest and range licensees in B.C. The statute sets the requirements for planning, road building, logging, reforestation, and grazing.
Free growing	Young trees that are as high or higher than competing brush vegetation with one metre of free-growing space surrounding their leaders. As defined by legislation, a free growing crop means a crop of trees, the growth of which is not impeded by competition from plants, shrubs or other trees. Silviculture regulations further define the exact parameters that a crop of trees must meet, such as species, density and size, to be considered free growing.
FSP	(Forest Stewardship Plan) An operational plan that explicitly states the results or strategies licensees will implement to address government-set objectives for key forest values, such as soil, water, fish, wildlife, and biodiversity within riparian areas. This plan may be in place for up to five years.
GHG	(Green house gas). A gas, such as water vapour, carbon dioxide, methane, chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs), that absorbs and re-emits infrared radiation, warming the earth's surface and contributing to climate change.
GIS	(Geographic Information System) Computer systems designed to allow users to collect, manage, and analyse large volumes of spatially referenced information and associated attribute data.
GMZ	(General Management Zone) The government's announcement of the VILUP characterised three types of resource management zones (RMZs). Among these, GMZs are designated as priority use areas to be managed for a variety of resource uses, such as forestry, mining, grazing, tourism, guide outfitting, and recreation.
HCI	(Hydrologic Condition Index) - A coarse-filter approach for providing a relative index to assess the potential impacts that climate, watershed character and manage may have on increased water flows that will ultimately affect water-related values.
High Significance	Will cause negative province-wide or broader publicity or has caused serious environmental damage, OR will result in $100,000 or more in total costs, including legal costs, fines, or remediation (e.g., local extirpation of a species, major reportable spill to water. All high significance incidents are reported individually upwards through the company to the Corporate Environmental Management Committee in accordance with the requirements of the FMS documents as soon as they are recorded as "high significance".
HLB	(Harvestable Landbase) A term used in ecosystem representation analyses that represents the productive forest areas, including lightly managed areas that contributes to, and are available for, long-term timber supply. HLB is defined by reducing the total landbase according to specified management assumptions classified as the non-harvestable landbase (NHLB).

HLP	(Higher Level Plan) Defined in the Forest Practices Code of British Columbia Act as: • a plan formulated pursuant to Section 4(c) of the Ministry of Forests Act and designated as a higher level plan by the district manager in accordance with direction from the chief forester; • a management plan designated as a higher level plan by the chief forester for tree farm licences and by the regional manager for other agreements under the Forest Act, • an objective for a resource management zone; • an objective for a landscape unit or sensitive area; • an objective for a recreation site, recreation trail or interpretive forest site, and; a plan or agreement declared to be a higher level plan by the ministers or the Lieutenant Governor in Council under this or any other act.
Indicator	A variable that measures or describes the state or condition of a value.
IPR	(Internal Patch Retention) An area occupied by a group of trees that is located within a cutblock where the trees could directly impact on, or be directly impacted by, a forest practice carried out in the cutblock. These are established to meet ecosystem-based patch retention targets.
ITS	(Incident Tracking System) Canfor's internal database used to record and track environmental incidents that have the potential for becoming a non-compliance with legal requirements or a non- conformance with Canfor's operational procedures.
IWMS	(Identified Wildlife Management Strategy) Those species at risk that the deputy minister of Environment, Lands and Parks or a person authorised by that deputy minister, and the chief forester, agree will be managed through a higher level plan, wildlife habitat area or general wildlife measure.
Karst	The broad term for soluble rocks, often including cave systems. Karst on Vancouver Island is typically formed in limestone and exhibits surficial features such as sinkholes, springs, cave entrances and grikes (M. Davis, BC Speleological Federation, pers. comm.). Underground drainages form cave systems and can transport water from one surface drainage to another, sometimes passing under surface ridges and drainage divides.
Long-term	At a minimum, twice the period in years of the average life expectancy of the predominant tree species up to a maximum of 300 years.
LU	(Landscape Units) An area of land and water used for long-term planning of resource management activities. It is important for designing strategies and patterns for landscape level biodiversity and for managing other forest resources. A landscape unit may be used by the District Manager to establish objectives for any propose permitted under section 2 of the Forest Practices Code of British Columbia Act.
LUP	(Landscape Unit Plan) The Forest Practices Code of British Columbia Act enables the Ministry of Forests to initiate landscape unit plans that cover individual watersheds or groups of watersheds at 1:20 000 to 1:50 000 scale. The purpose of these plans is to provide direction on biodiversity, old growth forest retention, wildlife habitat maintenance and timber harvesting.
Medium Significance	Will cause negative local publicity or has caused moderate environmental damage, OR will result in $15,000 or more in total costs, including legal costs, fines, or remediation, or will (e.g., Cutting less than 50 m3 outside a marked boundary). All medium significance incidents are reported upwards through the company to the Corporate Environmental Management committee in accordance with the requirements of the FMS documents on a quarterly schedule grouped together by division as medium significance.
MoELP	(Ministry of Environment, Land and Parks) Past provincial government agency responsible for various areas currently addressed by the MWLAP.
MoF	(Ministry of Forests) BC Provincial government and ministry responsible for the management and protection of the province's forest and range resources for the best balance of economic, social, and environmental benefits to British Columbia. In June 2005, the BC Government realigned ministerial responsibilities. The MoF used in this document is now managed under the Ministry of Forests and Range.
Monitor	Repeated observation, through time, of selected objects and values in the ecosystem to determine the state of the system. In particular, it entails the comparison of objects (e.g., organisms) and processes (e.g., stream flow) before and after management actions to determine the effect of those actions upon the ecosystem.
MP	(Management Plan) A detailed long-term plan required for Tree Farm Licences that involves inventories and management objectives for managing forest and other resources.

MSRM	(Ministry of Sustainable Resource Management) The lead provincial government agency responsible for planning, policies and resource information in support of the sustainable economic development of Crown land, water and resources. In June 2005, the BC Government realigned ministerial responsibilities. Responsibilities of the MSRM referred to in this document are now managed under the Ministry of Agriculture and Lands.
MWLAP	(Ministry of Water, Land and Air Protection - formerly the MoELP) The lead provincial government agency responsible for: • Environmental protection of water, land and air quality including climate change and environmental emergencies, • Environmental stewardship of biodiversity, including wildlife, fish and protected areas, • Park and wildlife recreation management, including hunting, angling, park recreation, and • Wildlife viewing, Environmental monitoring and enforcement including the Conservation Officer Service, and State of Environment reporting. In June 2005, the BC Government realigned ministerial responsibilities. Most responsibilities in the MWLAP used in this document are now managed under the Ministry of Environment, while integrated land management responsibilities are now under the Ministry of Agriculture and Lands.
NCLB	(Non-Contributing Landbase) A term used in timber supply analyses that represents the productive forest area, including all partially constrained areas that are constrained from harvest due to some regulatory or physical impediment to harvesting (e.g., old growth management areas, ungulate winter ranges, wildlife habitat areas, physically inoperable areas, riparian reserve zone).
NDT	(Natural disturbance type) An area that is characterized by a natural disturbance regime, such as wildfires, which affects the natural distribution of seral stages. For example areas subject to less frequent stand-initiating disturbances usually have more old forests.
NHLB	(Non-Harvestable Landbase) A term used in ecosystem representation analyses that represents the productive, forested lands areas that are greater than 90% constrained from harvest due to some regulatory or physical impediment to harvesting (e.g., old growth management areas, ungulate winter ranges, wildlife habitat areas, physically inoperable areas, riparian reserve zone).
NICC	(North Island - Central Coast) An organizational unit of the BC MoF called a forest district, that encompasses Nimpkish Valley on Vancouver Island in the south to Princess Royal Island in the north and stretches from the Pacific Ocean to Tweedsmuir Provincial Park.
NRMB	(Nimpkish Resource Management Board) A partnership of stakeholders committed to the well being of salmon stocks on Northern Vancouver Island (http://www.nrmb.net/).
NSR	(Non-Satisfactorily Restocked) Productive forest land that has been denuded and has failed, partially or completely, to regenerate either naturally or by planting or seeding to the specified or desired free growing standards for the site.
NVAF	(Net Volume Adjustment Factor) Within the ground-sampling phase of a VRI, NVAF sampling is a mandatory component that is integral in the calculation of inventory adjustment factors. NVAF sampling collects data on a number of selected trees to account for errors in the estimates of net tree volume. It is calculated from the ratio of actual to estimates of sample tree volumes and is applied as a correction to VRI ground sample volumes. This data, used in conjunction with the original ground sampling data, provides an unbiased estimate of the net volume in the project area.
NWAC	(Nimpkish Woodlands Advisory Committee) An ongoing committee of individuals representing by a broad range of interests relating to the Nimpkish DFA, established to facilitate the public participation process under the CSA SFM system standard.
Objective	A broad statement describing a desired future state or condition of a value.
OGMA	(Old Growth Management Area) Defined in the Forest Practices Code of British Columbia Act Operational Planning Regulation as an area established under a higher level plan which contains or is managed to replace structural old growth attributes. Old growth forests on BC's coast are characterised by the following: • Two or more tree species of variable sizes and spacing; • Large live trees; • Patchy understory; • A deep, multi-layered crown canopy with gaps: • Standing dead trees (snags) and coarse woody debris of variable sizes.

OSB	(Oriented Strand Board) A type of mat-formed panel with oriented face and back-strands and possibly cross-oriented core strands, and made of strands whose length is at least twice their width.
PMP	(Pest Management Plan) A plan that describes: (a) a program for controlling pests or reducing pest damage using integrated pest management, and (b) the methods of handling, preparing, mixing, applying and otherwise using pesticides within that program.
Preferred and Acceptable Species	Preferred and acceptable tree species are those commercial tree species that are suited to the growing conditions of the site, and are identified in the Silviculture Prescription.
PAs	(Protected Areas) Areas such as provincial parks, federal parks, wilderness areas, ecological reserves, and recreation areas that have protected designations according to federal and provincial statutes. Protected areas are land and freshwater or marine areas set aside to protect the province's diverse natural and cultural heritage.
RDMW	Regional District of Mount Waddington.
Red-listed Species	In British Columbia, the designation of an indigenous species, sub-species, or population as endangered or threatened because of its low abundance and consequent danger of extirpation or extinction. Endangered species are any indigenous species threatened with imminent extinction or extirpation throughout all or a significant portion of their range in BC Threatened species are any indigenous species that are likely to become endangered in BC if factors affecting that vulnerability are not reversed.
Regeneration Delay	The maximum time allowed in a prescription, between the start of harvesting in the area to which the prescription applies, and the earliest date by which the prescription requires a minimum number of acceptable well-spaced trees per hectare to be growing in that area.
RISC	(Resource Inventory Standards Committee) A multi-agency responsible for establishing standards for natural and cultural resources inventories, including collection, storage, analysis, interpretation and reporting of inventory data.
RMZ	(Resource Management Zone) A division or zone of the planning area that is distinct from other zones with respect to biophysical characteristics, resource issues or resource management direction. RMZs are drawn on a map to describe general management intent. These zones are further defined in the VILUP using descriptive objectives and strategies to explain future land use and resource management activities.
ROCE	(Return on Capital Employed) A ratio that indicates the efficiency and profitability of a company's capital investments, calculated as profit before interest, tax and inventory devaluations divided by the difference between total assets and current liabilities.
Rotation	The planned number of years between the formation and regeneration of a tree crop or stand and its final cutting at a specified stage of maturity.
SARA	(Species at Risk Act) The Act is a key federal government commitment to prevent wildlife species from becoming extinct and secure the necessary actions for their recovery. It provides for the legal protection of wildlife species and the conservation of their biological diversity.
Selection silviculture system	A silviculture system that removes mature timber either as single scattered individuals or in small groups at relatively short intervals repeated indefinitely, where the continual establishment of regeneration is encouraged and an uneven-aged stand is maintained. As defined in the Code's Operation Planning Regulation, group selection removes trees to create openings in a stand less than twice the height of mature trees in the stand.
Seral Stage	Any stage of development of an ecosystem from a disturbed, unvegetated state to a climax plant community. (FP Code)
SFM	(Sustainable Forest Management) Management 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.
SFM plan	(Sustainable Forest Management Plan) A plan that directs tactical and operational plans and practices, as the outcome of the strategic planning for a DFA.
Site Degradation	Productive forest land significantly degraded or permanently lost to forest production.

Site Index	An expression of the forest site quality of a stand, at a specified age, based either on the site height, or on the top height (height of the largest diameter tree on a 0.01 ha plot, providing the tree is suitable), which is a more objective measure (FPCode). The measure of the relative productive capacity of a site for a particular tree species, based on height at a given reference or base age (50).
Site Series	Variation in site conditions encountered within a biogeoclimatic unit is accommodated within the site classification of BEC. The site series describes all land areas capable of supporting specific climax vegetation. This can usually be related to a specified range of soil moisture and nutrient regimes within a subzone or variant, but sometimes other factors, such as aspect or disturbance history, are important determinants as well. A classification of site series for most of the biogeoclimatic units of the province has been developed by the BC Ministry of Forests and is presented in regional field guides.12
SMZ	(Special Management Zone) The government's announcement of the VILUP characterised three types of resource management zones (RMZs). Among these, SMZs are designated as priority use areas for sensitive management of wildlife, old growth, visual, recreation and other non-timber resources.
Snag	Standing dead tree or part of a dead tree.
SP	(Site Plan or Silviculture Prescription) Site plans describe standards units for soil disturbance and stocking standards, and show how the results and strategies in approved FSPs apply to the site. Site plans are not approved by government.
SPAR	(Seed Planning and Registry System) A web-based information management system supported by the MoF that provides clients with direct on-line access to a provincial registry of forest tree seed and a comprehensive seedling ordering system for meeting annual reforestation needs.
Stand Level	The level of forest management at which a relatively homogeneous land unit can be managed under a single prescription, or set of treatments, to meet well-defined objectives.
STR	(Singe Tree Retention) An area occupied by single, or very small groups of trees that are located in a cutblock where the trees could directly impact on, or be directly impacted by, a forest practice carried out in the cutblock. These are established to meet ecosystem-based tree retention targets.
Strategy	A coordinated action set designed to meet established targets.
Target	A specific statement describing a desired future state or condition of an indicator. If possible, targets should be clearly defined, time-limited and quantified.
TAUP	(Total Area Under Prescription) The Total net area to be reforested (NAR) plus the area of no-planned reforestation (NPR) on a cutblock. This includes all areas considered non-productive and areas that will not be reforested due to a unique reason (e.g., WTP).
TEM	(Terrestrial Ecosystem Mapping) Stratification of a landscape into map units, according to a combination of ecological features, primarily climate, physiography, surficial material, bedrock geology, soil, and vegetation. TEM is a methodology that requires direct air photo interpretation of ecosystem attributes by a mapper(s).
TFL	(Tree Farm Licence) A stewardship agreement based on a sustained yield, land-based management unit. This includes the right to harvest a specified volume of timber annually and the obligation to carry out all phases of forest management on behalf of the Ministry of Forests. The licence has a term of 25 years and is replaceable every 10 years.
THLB	(Timber harvesting landbase) A term used in timber supply analyses that represents the productive forest area, including portions of all partially constrained areas that contributes to, and is available for, long-term timber supply. THLB is defined by reducing the total landbase according to specified management assumptions classified as the non-contributing landbase (NCLB).
Timber	Timber means trees, whether standing, fallen, living, dead, limbed, bucked or peeled (Forest Act).
Timber supply analysis	An assessment of future timber supplies over long planning horizons (more than 200 years) by using timber supply models for different scenarios identified in the planning process.
Timber supply review	The timber supply review program regularly updates timber supply in each of the 37 TSAs and 34 TFLs areas throughout the province. By law, the chief forester must re-determine the AAC at least once every five years to ensure AACs are current and reflect new information, new practices and new government policies.

TL	(Timber licence) An area-based tenures which revert to the government when merchantable timber on the area has been harvested and the land reforested. Many of these licences have been incorporated into tree farm licences.
TSM	(Terrain Stability Mapping) A method to categorise, describe and delineate characteristics and attributes of surficial materials, landforms, and geological processes within the natural landscape. Terrain stability mapping is a method to delineate areas of slope stability with respect to stable, potentially unstable, and unstable terrain within a particular landscape. Terrain stability map polygons indicate areas or zones of initiation of slope failure.
Twenty year plan	A TFL licensee submits an operational timber supply projection that indicates the availability of timber by setting out a hypothetical sequence of harvesting over a period of at least 20 years, consistent with proposed management objectives. The main purpose of the plan is to demonstrate whether or not the harvests projected in the base case over the next 20 years are spatially feasible, taking into account constraining factors such as Code requirements, timber harvesting landbase deductions and the volume assignments per hectare on each entry.
Value	A DFA characteristic, component, or quality considered by an interested party to be important in relation to a CSA SFM element or other locally identified element.
VIA	(Visual Impact Assessment) An evaluation of the visual impact of resource development proposals on forest landscape.
VILUP	(Vancouver Island Land Use Plan) The regional land use plan and higher-level plan for Vancouver Island (in effect since December 2000) that includes broad management objectives for resource management zones and specific targets for some resources.
VRI	(Vegetation Resources Inventory) A photo-based, two-phased vegetation inventory program consisting of: • Phase I - Photo Interpretation involves estimating vegetation polygon characteristics, from existing information, aerial photography, or other sources. No sampling is done in Phase I. • Phase II - Ground Sampling provides the information necessary to determine how much of a given characteristic is within the inventory area. Ground samples alone cannot be collected in sufficient numbers to provide the specific locations of the land cover characteristics being inventoried.
Waste Wood	The volume of timber left on the harvested area that should have been removed in accordance with the minimum utilisation standards in the cutting authority. It forms part of the allowable annual cut for cut-control purposes.
Waterbody	Any land covered by water.
WHA	(Wildlife Habitat Area) A mapped area of land that is necessary to meet the habitat requirements of one or more species of identified wildlife.
Wildlife Habitat Feature	A significant mineral lick or wallow, an active nest of a bald eagle, osprey or great blue heron, or any other feature agreed to by the district manager and a designated environment official.
Wildlife Tree	Any standing dead or live tree with special characteristics that provide valuable habitat for the conservation or enhancement of wildlife - Wildlife Tree Committee of British Columbia
Windthrow	A tree or trees uprooted by the wind.
WTP	(Wildlife tree patch) At a stand level, this is synonymous with WTR (wildlife tree retention).
WTR	(Wildlife tree retention) An area occupied by wildlife trees that is located in a cutblock or in an area that is contiguous to a cutblock where the wildlife trees could directly impact on, or be directly impacted by, a forest practice carried out in the cutblock.